



Environment and Natural Resources Trust Fund (ENRTF) M.L. 2016 Work Plan

Date of Report: 6/3/2016

Date of Next Status Update Report: 12/31/2016

Date of Work Plan Approval:

Project Completion Date: 6/30/2019

Does this submission include an amendment request? No

PROJECT TITLE: Controlling Reed Canary Grass to Regenerate Floodplain Forest

Project Manager: Tim Schlagenhaft

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Location: Goodhue, Wabasha, Winona, Houston Counties

Total ENRTF Project Budget:

ENRTF Appropriation: \$218,000

Amount Spent: \$0

Balance: \$218,000

Legal Citation: M.L. 2016, Chp. 186, Sec. 2, Subd. 08e

Appropriation Language:

\$218,000 the second year is from the trust fund to the commissioner of natural resources for an agreement with the Minnesota state office of the National Audubon Society to determine the most effective regeneration methods for restoration of floodplain forests in southeast Minnesota impacted by invasive reed canary grass. This appropriation is available until June 30, 2019, by which time the project must be completed and final products delivered.

I. PROJECT TITLE: Controlling Reed Canary Grass to Regenerate Floodplain Forest

II. PROJECT STATEMENT: This project will help ensure the future of Mississippi River floodplain forests by developing the most effective methods for regenerating native trees in areas that are threatened by invasive reed canary grass. It will leverage Outdoor Heritage and private funding currently being used for reed canary grass control and tree planting within the floodplain. This project will evaluate different methods of reed canary grass control as well as different strategies for tree planting at sites within the Mississippi River floodplain with similar hydrological conditions and existing vegetation (primarily reed canary grass).

Floodplain forests protect water quality and provide critical habitat for wildlife. The Upper Mississippi River (Minneapolis to St. Louis) contains some of the most significant tracts of floodplain forest in the nation. However, the long-term existence of these forests is under threat from invasive reed canary grass, which aggressively out-competes tree seedlings.

Floodplain forests in the Upper Mississippi River are dominated by even-aged tree stands with low species diversity. It is expected that canopy trees will begin to die off in the next 50-70 years. Current knowledge suggests that as adult trees die they will be replaced by reed canary grass dominated wet meadows. Without active restoration, Minnesota may lose much of its floodplain forests, along with the many species of birds and other wildlife that depend upon these habitats for survival. This effort will greatly advance the science and understanding of reed canary control methods and tree survival within the Mississippi River floodplain, with direct application to Foresters and Wildlife Managers.

III. PROJECT STATUS UPDATES:

Project Status as of December 31, 2016

Project Status as of April 30, 2017

Project Status as of October 31, 2017

Project Status as of April 30, 2018

Project Status as of October 31, 2018

Project Status as of April 30, 2019

Overall Project Outcomes and Results: June 30, 2019

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Determine the most effective methods to control reed canary grass and regenerate trees.

Description: Competition from reed canary grass is one of the primary factors limiting forest regeneration in the floodplain. We will test the efficacy of reed canary grass control methods and examine the impact on tree regeneration. We will document pre-treatment reed canary grass levels and then test the efficacy of reed canary grass control using glyphosate herbicide versus a combination treatment of site scarification plus the herbicide Oust. Treatments will be replicated eight times in large plots within each of four 10 acre sites. Our replication will allow us to examine efficacy of treatments across a range of elevations, soils, and light availability within and among sites. Reed canary grass percent cover, height, and flowering culm production will be monitored for two full growing seasons. Our results will provide crucial evidence about how fluctuating water levels and variable site conditions within the floodplain influence restoration success, improving our ability to develop site-level prescriptions for future projects.

We will evaluate natural regeneration and artificial regeneration in both reed canary grass (RCG) treatments. Focal species for artificial regeneration include: silver maple (*Acer saccharinum*), cottonwood (*Populus deltoides*), sandbar willow (*Salix interior*), swamp white oak (*Quercus bicolor*). Within each replicate plot at all sites we will directly seed ~1/5 of the plot in a continuous strip (~30x150 ft) (4 sites x 2 RCG treatments x 8 replicates = 64 strips) in fall 2017 and spring 2018. In addition, we will plant our focal species as bare root and Root Production Method seedlings. Seedlings will be planted with 9 ft spacing in polycultures. We will monitor survival and growth (height, diameter) of planted juveniles. We will assess natural tree regeneration of these same species by monitoring abundance and growth of naturally established seedlings in ten additional 3 ft square plots per replicate (4 sites x 2 RCG treatments x 7 replicates x 10 plots = 640 plots).

Summary Budget Information for Activity 1:

ENRTF Budget: \$ 205,000
Amount Spent: \$ 0
Balance: \$205,000

Activity Completion Date:

Outcome	Completion Date
1. Data set on the effectiveness of two alternate site treatment strategies for controlling reed canary grass	January 2019
2. Data set on the extent of natural tree regeneration following reed canary grass control	January 2019
3. Data set on tree establishment, survival and growth by regeneration method and species following reed canary grass control	January 2019
4. Final research report documenting the effectiveness of various reed canary control methods, natural regeneration, and tree establishment, survival and growth	June 2019

Project Status as of December 31, 2016

Project Status as of April 30, 2017

Project Status as of October 31, 2017

Project Status as of April 30, 2018

Project Status as of October 31, 2018

Project Status as of April 30, 2019

Final Report Summary: June 30, 2019

ACTIVITY 2: Provide foresters and wildlife managers with information on the most effective methods to control reed canary grass and regenerate trees.

Description: We will use results from Activity 1 as well as data gathered from other sources to develop a decision support tool (likely online) to inform preparation of site-level management prescriptions using the most effective methods for regenerating forest given site conditions and financial resources. Users would input data on variables identified as important in this study, as well as operational constraints such as funding. Based on the combination of factors, the tool will recommend particular species, planting techniques and RCG control techniques that would lead to highest survival and best growth of a new cohort of trees. We would also contribute results of our project as a case study in the North Central Region Bottomland Hardwood Management Guide (http://www.ncrs.fs.fed.us/fmg/nfmg/bl_hardwood/index.html).

Summary Budget Information for Activity 2:

ENRTF Budget: \$ 13,000
Amount Spent: \$ 0
Balance: \$13,000

Activity Completion Date:

Outcome	Completion Date
1. Decision support tool that documents the most effective methods for controlling reed canary grass and regenerating floodplain forest for writing site-level prescriptions.	January 2019
2. Decision support tool is distributed to professional foresters and wildlife managers	June 2019

Project Status as of December 31, 2016

Project Status as of April 30, 2017

Project Status as of October 31, 2017

Project Status as of April 30, 2018

Project Status as of October 31, 2018

Project Status as of April 30, 2019

Final Report Summary: June 30, 2019

V. DISSEMINATION:

Description: Project results and reports will be disseminated through a wide variety of outlets. As described in Activity 2 above, a decision support tool will be distributed to professional foresters, wildlife managers, and other professionals. This tool, including background and instructions, will likely be web-based with access information provided through professional societies, universities, state and federal agencies, conservation non-profits, and other applicable organizations.

Applicable scientific research reports will be submitted to professional journals for publication.

Results will also be presented via formal presentations to professional societies, at conferences, and to interested conservation and forestry related groups. News releases and other “highlights” will be provided to conservation media outlets.

Project Status as of December 31, 2016

Project Status as of April 30, 2017

Project Status as of October 31, 2017

Project Status as of April 30, 2018

Project Status as of October 31, 2018

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget Overview:

Budget Category	\$ Amount	Explanation
Personnel:	\$46,800	Personnel costs include 9% FTE for Audubon’s Program Manager, 10% FTE for Audubon’s Forest Ecologist, and 4% FTE for Audubon’s Administrative Assistant for each of the 3 years of funding. This represents 10%, 9%, and 2% of total project costs for each position, respectively. For all personnel, 66.5% goes towards salary and 33.5% towards benefits.
Professional/Technical/Service Contracts:	\$143,800	<p>These costs are to contract with the University of Minnesota and University of Wisconsin-La Crosse to hire graduate students, staff scientists or post doctoral research associates, and undergraduate research interns to conduct the research specific to reed canary grass control and tree planting methods (all research sites will be in MN).</p> <p>The University of Minnesota contract will fund one graduate student, staff scientist or post doctoral research associate and one undergraduate research intern. The graduate student will be funded at 50% FTE for 2.5 years (55% salary, 45% fringe benefits) at a total cost of \$97,700 (45% of total project costs). The undergraduate research intern will assist graduate students with field work full time for 3 months during summer each year for 2 years. Total cost to the grant for the undergraduate research intern is \$10,000 (\$5,000 each year) and represents 5% of the total project cost.</p> <p>Contracting with the University of Wisconsin – La Crosse is necessary to secure the expertise of Dr. Meredith Thomsen, who is a leader in researching reed canary grass control methods and has extensive experience specific to the Mississippi River floodplain. Dr Thomsen has also worked personally with foresters and wildlife managers in Minnesota and will be able to apply results of this study to restoration projects in Minnesota. The University of Wisconsin contract will fund one graduate student. The graduate student is a current employee of the US Fish and Wildlife</p>

		Service. The US Fish and Wildlife Service will continue to fund the employees position at 80%, and the LCCMR grant will fund 20% of their salary. The student will work 50% FTE for 2.5 years on the LCCMR project. Total cost to the grant is \$36,100, of which \$27,500 is salary and \$8,600 is fringe (76% salary, 24% fringe). The total amount of the grant going to the University of Wisconsin La Crosse is \$36,100 or 17% of the total project cost.
Travel Expenses in MN:	\$22,200	Travel costs include mileage for 3 project staff (e.g. graduate students, staff scientists or post doctoral research associates, undergraduate research intern) to each travel up to an estimated 100 miles/day to and from research sites for 60 days each year for 2 years, for a total cost of approximately \$13,200 (6% of total project cost). In addition, overnight lodging and meals (estimated \$90/day) are anticipated for up to 50 days for project staff during each of the two years of field work, for a total cost of \$9,000 (4% of total project cost).
Supplies:	\$5,200	Supplies including flagging, pvc pipe, seedling tags, work gloves, hand tools, data collection supplies, etc. are needed to delineate study plots and monitor tree seedling survival and growth.
Other:	\$	
TOTAL ENRTF BUDGET: \$218,000		

Explanation of Use of Classified Staff: N/A – we are not a state agency.

Explanation of Capital Expenditures Greater Than \$5,000: N/A

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 0.69

Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: 3.0 (two 50% FTE’s funded for 2.5 years each, and one undergraduate research intern for 3 months each of two years)

B. Other Funds:

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
Non-state			
University of Wisconsin La Crosse – waiver of overhead charges for graduate student and faculty in-kind contributions	\$16,500		Waiving overhead charges of \$9,000 for graduate student benefits (\$3,600/year for 2.5 years) and \$7,500 in indirect contributions from faculty (\$2,500/year for 3 years).

US Fish and Wildlife Service	\$50,000		Will contribute 30% of University of WI – La Crosse graduate student salary to research study
State			
Outdoor Heritage funding, cash	\$30,000		\$30,000 in Outdoor Heritage Funding will be used to implement floodplain forest restoration projects at research study sites. This is part of a \$300,000 appropriation for floodplain forest restoration along the Mississippi River beginning in July 2014 and ending June 30, 2017
Outdoor Heritage funding, cash	\$50,000		\$50,000 in Outdoor Heritage Funding will be used to implement floodplain forest enhancement projects at research study sites. This is part of a \$412,000 appropriation being recommended by LSOHC for funding beginning in July 2016
University of Minnesota , in-kind	\$65,000		Indirect contributions from faculty (2% time for 3 years, 66% salary and 44% fringe) and unrecovered indirect costs at 52% of direct cost base \$107,700.
TOTAL OTHER FUNDS:	\$211,500	\$	

VII. PROJECT STRATEGY:

A. Project Partners: This project is a collaborative effort between Audubon Minnesota, the University of Minnesota, and the University of Wisconsin La Crosse. Primary team members include: Andy Beebe, Sue Swanson, and Tim Schlagenhaft (Audubon Minnesota); Dr. Rebecca Montgomery (University of Minnesota); Dr. Meredith Thomsen (UW La Crosse). Dr. Montgomery is a forest ecologist with experience in research and assessment of floodplain forest ecosystems, and Dr. Thomsen is a leader in reed canary grass control and effects on regeneration along the Upper Mississippi River. Dr. Thomsen’s expertise in reed canary grass research specific to the Mississippi River is the reason some funding would go out of state.

The University of Minnesota, via contract with Audubon, Minnesota would receive \$118,800 (\$107,700 for research staff [e.g. graduate student, staff scientist or postdoctoral research associate and undergraduate research intern] salaries, fringe, and \$11,100 for travel), and the University of Wisconsin - La Crosse via contract with Audubon would receive \$47,200 (\$36,100 for graduate student salary and fringe and \$11,100 for travel), \$5,200 will be spent on supplies, and Audubon Minnesota will spend \$46,800 to manage the overall project, implement restoration and enhancement projects at the study sites, and assist with monitoring and research activities.

This team will also work closely with foresters and biologists from the US Fish and Wildlife Service, U.S. Army Corps of Engineers, and Minnesota DNR who will help with developing site prescriptions and project implementation, as well as dissemination of the final products and decision support tool. Funding from the Outdoor Heritage fund through a grant with Audubon will be used to implement projects on public lands.

B. Project Impact and Long-term Strategy: This effort is part of Audubon’s long-term strategy to sustain and restore floodplain forest for birds and other wildlife along the Upper Mississippi River. Audubon hired a full time Forest Ecologist in January, 2015 to expand our work in this area. We secured \$300,000 in Outdoor Heritage funding (July 2014-June 2017) and \$20,000 in private funding and have been implementing restoration projects.

However, we do not have funding to study the most effective restoration techniques. This is a critical question facing foresters and wildlife managers across the Upper Mississippi River. LCCMR funding will be used to conduct the studies needed to determine the most effective methods to control reed canary grass and regenerate trees, and to get this information in the hands of resource managers as a practical decision making tool for writing site-level management prescriptions. This will ensure future funds are spent on the most effective restoration projects.

Approximately \$30,000 of a current LSOHC grant for \$300,000 will be available to implement projects at the sites selected for study if the LCCMR proposal is funded. An additional \$412,000 is being recommended for funding by LSOHC to continue implementing forest restoration projects from 2016-2019, \$50,000 of this grant will be used to implement projects at the research study sites. This LCCMR proposal will provide the information and decision support tools for river managers to most effectively implement forest restoration projects using funding from other sources into the future.

C. Spending History:

Funding Source	M.L. 2008 or FY09	M.L. 2009 or FY10	M.L. 2010 or FY11	M.L. 2011 or FY12-13	M.L. 2013 or FY14
Outdoor Heritage Funding					300,000

(add or remove rows and columns as needed)

VIII. ACQUISITION/RESTORATION LIST: This work will be conducted on approximately 10 acre study plots located within larger project areas. Outdoor Heritage funding will be used to do the actual enhancement work (treating reed canary grass, tree planting) within the larger project areas, and LCCMR funding will be used to conduct the research and monitoring at study plots within those areas. Potential project areas have been identified near La Crescent, Winona, and Red Wing, MN, but the specific project areas for this study have not yet been determined. They will be selected based upon existing vegetation (dominated by reed canary grass), soil type, and hydrology. The Research Addendum will describe in more detail how we will select project sites and locations for study plots.

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

X. ACQUISITION/RESTORATION REQUIREMENTS WORKSHEET: All activities within the project areas and study plots will occur on permanently protected land, primarily within the Upper Mississippi River National Wildlife and Fish Refuge, Minnesota state forests, and Minnesota state Wildlife Management Areas.

Enhancement activities will be conducted following state and federal guidelines to ensure ecological integrity and pollinator enhancement. All enhancement activities will follow the recommendations of MN DNR Foresters or USFWS Biologists.

Conservation Corps Minnesota will be given the opportunity to bid on projects involving tree planting.

XI. RESEARCH ADDENDUM: Will be provided by December 11, 2015 deadline

XII. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted no later than December 31, 2016; April 30, 2017; October 31, 2017; April 30, 2018; October 31, 2018, and April 30, 2019. A final report and associated products will be submitted between June 30 and August 15, 2019.

Environment and Natural Resources Trust Fund
M.L. 2016 Project Budget



Project Title: Controlling Reed Canary Grass to Regenerate Floodplain Forest

Legal Citation: M.L. 2016, Chp. 186, Sec. 2, Subd. 08e

Project Manager: Tim Schlagenhaft

Organization: Audubon Minnesota

M.L. 2016 ENRTF Appropriation: \$ 218,000

Project Length and Completion Date: June 30, 2019

Date of Report: June 3, 2016

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Activity 1 Balance	Activity 2 Budget	Amount Spent	Activity 2 Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	Determine most effective methods to control reed canary grass and regenerate trees			Provide foresters and wildlife managers with information on the most effective methods to control reed canary grass and regenerate trees				
Personnel (Wages and Benefits)	\$46,800	\$0	\$46,800				\$46,800	\$46,800
Tim Schlagenhaft, Project Manager: \$22,400 (66.5% salary, 33.5% benefits); 9% FTE each year for three years.								
Andrew Beebe, Forest Ecologist: \$19,200 (66.5% salary, 33.5% benefits); 10% FTE each year for three years.								
Sue Swanson, Administrative Assistant: \$5,200 (66.5% salary, 33.5% benefits); 4% FTE each year for three years.								
Professional/Technical/Service Contracts								
University of Minnesota contract to fund one graduate student, staff scientist, or post doctoral research associate and one undergraduate research intern to conduct research. Graduate student will be a 50% FTE for 2.5 years (55% salary, 45% fringe benefits) for a total cost of \$97,700 (45% of total project cost). Undergraduate research intern will assist with data collection for 3 months each of two years for a total cost of \$10,000 (\$5,000/year and 5% of the total budget).	\$99,400	\$0	\$99,400	\$8,300	\$0	\$8,300	\$97,700	\$107,700
University of Wisconsin La Crosse contract to fund one graduate student to conduct research. Position salary will be funded 80% by US Fish and Wildlife Service and 20% from grant. Position will work 50% FTE for 2.5 years (76% salary, 24% fringe benefits) on the research project for a total cost of \$36,100 (17% of total project cost).	\$33,000	\$0	\$33,000	\$3,100	\$0	\$3,100	\$46,100	\$36,100
Travel expenses in Minnesota								
Mileage for three project staff (graduate students, staff scientists, or post doctoral research associates, undergraduate research intern) to each travel up to an estimated 100 miles/day to and from research sites for 60 days each year for two years, for a total project cost of approximately \$13,200 (6% of total project cost).	\$13,200	\$0	\$13,200				\$13,200	\$13,200
Overnight lodging and meals (estimated \$90/day) are anticipated for up to 48 days for project staff during each of the two years of field work, for a total cost of \$8,500 (4% of total project cost).	\$9,000	\$0	\$9,000				\$9,000	\$9,000
Supplies								
Supplies including flagging, pvc pipe, hand tools, work gloves, data collection supplies, seedling tags, etc.	\$5,200	\$0	\$5,200				\$5,200	\$5,200
COLUMN TOTAL	\$205,000	\$0	\$205,000	\$13,000	\$0	\$13,000	\$218,000	\$218,000

LCCMR Reed Canary Study Site Locations



