

## Lessard-Sams Outdoor Heritage Council Laws of Minnesota 2014 Final Report



**Date:** January 30, 2018

**Program or Project Title:** Floodplain Forest Enhancement - Mississippi River

**Funds Recommended:** \$300,000

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**Legislative Citation:** ML 2014, Ch. 256, Art. 1, Sec. 2, Subd. 3(h)

**Appropriation Language:** \$300,000 is to the commissioner of natural resources for an agreement with National Audubon Society to enhance floodplain forest habitat for wildlife on public lands along the Mississippi River. A list of restorations and enhancements must be provided as part of the required accomplishment plan.

**County Locations:** Goodhue, Houston, Wabasha, and Winona.

**Regions in which work was completed:**

- Southeast Forest

**Activity types:**

- Enhance

**Priority resources addressed by activity:**

- Forest

### Summary of Accomplishments:

Floodplain forest enhancement projects were implemented at 10 sites covering 292 acres along the Mississippi River from Red Wing to the Iowa border. We completed site preparation; controlled invasive species; planted trees and shrubs using a combination of direct seeding, bare root seedlings and large, potted trees; protected trees from deer and voles; completed post tree planting weed control; and installed willow and cottonwood cuttings. Outcomes varied by site, ranging from poor to excellent tree seedling survival.

### Process & Methods:

Audubon's floodplain forest enhancement program was designed to sustain floodplain forest along the Mississippi River and the lower ends of major tributaries. These forests, which provide critical habitat for forest dependent birds, are under threat from invasive species like reed canary grass. Without active management these forests will continue to decline over time.

Our program focused on controlling invasive species and regenerating a variety of tree and shrub species. We prepared sites for planting or natural regeneration using herbicide, disking, or mowing; planted tree seedlings, cottonwood cuttings, or direct seeded; protected trees from deer and voles; improved tree vigor and growth through selective thinning; and controlled weeds (herbicide, mowing) after planting.

Our geographic scope included the Mississippi River from Hastings to the Iowa border, and the lower ends of major tributaries. Much of

this area included state forest, Wildlife Management Areas, or National Wildlife and Fish Refuge lands.

Our priorities were determined in cooperation with MN DNR, US Fish and Wildlife Service, and US Army Corps of Engineers. All projects were on public lands owned and managed by these agencies. Priorities were based on forest condition and threats, habitat needs, logistics, and access. Our goal was to prevent or control invasive species long enough to establish forest canopy and maintain a diverse forest structure that benefits birds and other wildlife. Our objectives were designed to utilize a variety of enhancement tools, monitor results, and apply that information to designing new projects.

A description of each project is provided below. For several sites additional work will be completed with Phase 2 of our floodplain forest enhancement program.

At Gores WMA, a 20-acre site north of Red Wing, we completed site preparation, planted bare root seedlings on 10 acres, and completed post planting weed control following tree planting on 10 additional acres that had been previously planted by US Army Corps of Engineers.

At the Cannon River Collischan Road Willow Project, a 10-acre site near Red Wing, we treated reed canary grass and cut willow trees along strips to encourage aggressive expansion of willows to prevent reed canary grass encroachment into adjacent high quality floodplain forest.

At Dukes Pond, a 22-acre site near Red Wing, we completed site preparation on 15 acres along the edge of existing high quality floodplain forest. Our intention was to plant trees the next fall on the treated area, but unusually high water prevented this from occurring. Bare root seedlings and potted trees had been purchased, so instead of planting the treated areas we planted 7 adjacent acres where DNR Forestry was planning a timber harvest. The planted trees will regenerate when the canopy opens up following harvest, and before reed canary grass can become established.

At North Clear Lake, a 9-acre site north of Red Wing, bare root seedlings were planted in the understory of existing floodplain forest scheduled for harvest by DNR Forestry. The planted trees will give a head start to regeneration when the canopy opens up following harvest, and before reed canary grass can become established.

At East Indian Creek Delta, a 55-acre site north of Weaver, site preparation was completed and tree and shrub seedlings were planted in an area dominated by ash trees. Shade tolerant seedlings will grow when the canopy opens up due to the death and decline of older trees.

At Whitewater Delta, a 51-acre site near Weaver, buckthorn was removed and bare root seedlings and potted trees were planted in an area dominated by ash trees with pockets of reed canary grass. The seedlings will grow when the canopy opens up due to emerald ash borer impacts on the existing trees.

At Whalen Tract, a 55-acre site just north of the Iowa border, a variety of activities were completed including site preparation, tree planting, cottonwood cuttings, and post planting weed control.

At Whitewater DNR, a 16-acre site approximately 5 miles upstream of the mouth of the Whitewater River, site preparation and direct seeding were completed.

At Cannon River Bottoms State Forest, a 30-acre site near Red Wing, site preparation was completed and tree seedlings and potted trees were planted in open pockets of reed canary grass within existing forest scheduled for harvest.

At Root River, a 93-acre site near La Crescent, a variety of activities were completed including site preparation, tree planting, cottonwood cuttings, direct seeding, and post planting weed control.

At four of the above sites (Cannon River Collischan Road Willow project, Whitewater DNR, Root River, Whalen Tract) up to 8 acres within or near each site was also treated for reed canary grass and planted with different tree species and stock types. This was part of a LCCMR study evaluating reed canary grass control, and tree survival and growth.

Evaluating success will take time. Because trees are slow growing, it can take a decade or longer for them to grow large enough to form a canopy, which will ultimately determine the success of these projects. Preliminary findings indicate initial survival of seedlings was variable. At some sites, post planting observations suggest low survival, however, small seedlings are difficult to locate in the forest understory. First year survival of bare root seedlings at the LCCMR study sites was 80-90%. Survival of potted trees at many sites was good, however there was some damage from deer.

Other findings resulting from this grant included: post tree planting weed control and maintenance is essential for tree seedling survival; tree guards and deer repellent are effective at protecting trees from deer and voles; cottonwood cuttings were relatively easy to install and effective at establishing trees; swamp white oak were resilient, relatively fast growing, and resistant to deer browse

making them a good choice for these sites; plantings on drier sites, with proper maintenance, take less time to establish than wetter sites; good natural regeneration can occur on some sites after exposing mineral soils; and back-up sites are needed to adjust to flooding situations which may prevent scheduled tree plantings. These findings have been incorporated into project management prescriptions.

## Explain Partners, Supporters, & Opposition:

Major partners included the US Fish and Wildlife Service (USFWS), US Army Corps of Engineers (USACE), Minnesota Department of Natural Resources (DNR), LCCMR, University of Minnesota (UM), and University of Wisconsin - La Crosse (UWL). We are working together to implement the Upper Mississippi River Systemic Forest Stewardship Plan which covers 300,000 acres along the Upper Mississippi River.

The USFWS funds 50% of the salary for our full-time Forest Ecologist who was responsible for implementing many of these projects. In addition, the USFWS provided vehicles and equipment to accomplish this work. USFWS also provided in-kind staff time for tree planting.

The USACE and DNR provided guidance, management prescriptions, tree planting recommendations for project sites, and in-kind staff time to help implement projects.

LCCMR provided funding for UM and UWL staff who assisted with tree planting and site preparation.

We are unaware of any opposition to these projects.

## Additional Comments:

### *Exceptional challenges, expectations, failures, opportunities, or unique aspects of program*

Floodplain forests are a difficult environment to work in due to frequent flooding, invasive species, deer and voles, logistics, and access. These challenges can affect project cost and success. Regeneration methods are not as well understood as traditional upland forest regeneration, and assessing success is difficult as it takes many years for trees to survive and grow large enough to create a forest canopy.

We have seen both successes and failures in seedling survival. This grant, phase 1, has greatly improved our understanding and knowledge of floodplain forest enhancement methods. With phase 2 and beyond, we will continue to adjust our project designs as we learn more about, and apply, the most effective methods for floodplain forest enhancement.

## Other Funds Received:

- Environmental and Natural Resource Trust Fund

### How were the funds used to advanced the program:

Environment and Natural Resource Trust Funds were used in combination with Outdoor Heritage funds to conduct a research study on the most effective ways to control reed canary grass and regenerate trees. OHF funding was used to complete the floodplain forest enhancement work including site preparation, purchase and plant trees, and conduct post planting weed control on study sites. LCCMR funding was used to hire graduate students and pay for supplies to conduct the research aspect of the project. Graduate students and faculty also provided significant in-kind contributions to site preparation and tree planting. These two funding sources in combination provided an excellent opportunity to implement, monitor, and evaluate floodplain forest enhancement methods. The results of the study advance the science of floodplain forest enhancement overall and will aid in implementing the most effective methods for future projects.

## What is the plan to sustain and/or maintain this work after the Outdoor Heritage Funds are expended:

This work is long-term, requiring site preparation, tree planting, and post planting maintenance, often a 3-5 year process or longer. Audubon will continue to monitor and observe progress at project sites regardless of OHF funding. With FY2016 funding (Phase 2) we will be able to complete post planting weed control and site maintenance at Upper Mississippi River National Wildlife and Fish Refuge project sites needing this work to ensure tree seedling survival. At MN State Forest sites, MN DNR will complete follow up maintenance. If necessary, supplemental plantings will be completed. Our hope is to continue this work long term, and we intend to submit additional OHF proposals for Phase 3 and beyond.

## Outcomes:

*The original accomplishment plan stated the program would*

**Programs in southeast forest region:**

- Healthier populations of endangered, threatened, and special concern species as well as more common species
- Large corridors and complexes of biologically diverse wildlife habitat typical of the unglaciated region are restored and protected

**How will the outcomes be measured and evaluated?**

Ultimately success will be determined by our ability to maintain or create diverse and connected floodplain forests with a variety of tree species, sizes, and ages. It can take a decade or longer for trees to establish and begin to form a canopy and provide habitat for birds and other wildlife. Floods especially can affect project success and require additional work and costs. Connecting fragmented areas to create larger forest tracts will provide habitat for rare species. We will continue to monitor tree survival and growth and adjust management as necessary to sustain healthy forests.

# Budget Spreadsheet

Final Budget line item reallocations are allowed up to 10% and do not need require an amendment to the Accomplishment Plan

Total Amount: \$300,000

## Budget and Cash Leverage

BudgetName	Request	Spent	Cash Leverage (anticipated)	Cash Leverage (received)	Leverage Source	Total (original)	Total (final)
Personnel	\$33,000	\$31,600	\$12,000	\$8,000	Private grants	\$45,000	\$39,600
Contracts	\$157,000	\$207,000	\$0	\$10,000	Private grants	\$157,000	\$217,000
Fee Acquisition w/ PILT	\$0	\$0	\$0	\$0		\$0	\$0
Fee Acquisition w/o PILT	\$0	\$0	\$0	\$0		\$0	\$0
Easement Acquisition	\$0	\$0	\$0	\$0		\$0	\$0
Easement Stewardship	\$0	\$0	\$0	\$0		\$0	\$0
Travel	\$0	\$0	\$0	\$0		\$0	\$0
Professional Services	\$0	\$0	\$0	\$0		\$0	\$0
Direct Support Services	\$0	\$0	\$0	\$0		\$0	\$0
DNR Land Acquisition Costs	\$0	\$0	\$0	\$0		\$0	\$0
Capital Equipment	\$0	\$0	\$0	\$0		\$0	\$0
Other Equipment/Tools	\$0	\$0	\$0	\$0		\$0	\$0
Supplies/Materials	\$110,000	\$61,400	\$0	\$0		\$110,000	\$61,400
DNR IDP	\$0	\$0	\$0	\$0		\$0	\$0
Total	\$300,000	\$300,000	\$12,000	\$18,000		\$312,000	\$318,000

## Personnel

Position	FTE	Over # of years	Spent	Cash Leverage	Leverage Source	Total
Community Conservation Coordinator	0.15	3.00	\$16,300	\$8,000	Private grants	\$24,300
Administrative Assistant	0.00	3.00	\$5,200	\$0		\$5,200
Forest Ecologist	0.00	2.00	\$10,100	\$0		\$10,100
Total	0.15	8.00	\$31,600	\$8,000		\$39,600

## Explain any budget challenges or successes:

Costs varied widely based on the methods implemented, with projects ranging from \$500-\$2500 per acre. We had an approved amendment to the accomplishment plan to adjust the budget to reflect higher administrative assistant costs, and moved a higher percentage of project implementation costs from supplies to contracts. Supply costs were primarily trees. We found it more efficient and effective to hire contractors to secure and plant trees than do the work ourselves with limited staff. Finding contractors was sometimes difficult, however, with only one bid received for some projects. Finding more contractors to bid future projects will reduce costs.

## All revenues received by the recipient that have been generated from activities on land with money from the OHF:

Total Revenue: \$0

Revenue Spent: \$0

Revenue Balance: \$0

- E. This is not applicable as there was no revenue generated.

# Output Tables

**Table 1a. Acres by Resource Type**

Type	Wetlands (original)	Wetlands (final)	Prairies (original)	Prairies (final)	Forest (original)	Forest (final)	Habitats (original)	Habitats (final)	Total (original)	Total (final)
Restore	0	0	0	0	0	0	0	0	0	0
Protect in Fee with State PILT Liability	0	0	0	0	0	0	0	0	0	0
Protect in Fee W/O State PILT Liability	0	0	0	0	0	0	0	0	0	0
Protect in Easement	0	0	0	0	0	0	0	0	0	0
Enhance	0	0	0	0	90	292	0	0	90	292
Total	0	0	0	0	90	292	0	0	90	292

**Table 2. Total Funding by Resource Type**

Type	Wetlands (original)	Wetlands (final)	Prairies (original)	Prairies (final)	Forest (original)	Forest (final)	Habitats (original)	Habitats (final)	Total (original)	Total (final)
Restore	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Enhance	\$0	\$0	\$0	\$0	\$300,000	\$300,000	\$0	\$0	\$300,000	\$300,000
Total	\$0	\$0	\$0	\$0	\$300,000	\$300,000	\$0	\$0	\$300,000	\$300,000

**Table 3. Acres within each Ecological Section**

Type	Metro Urban (original)	Metro Urban (final)	ForestPrairie (original)	Forest Prairie (final)	SE Forest (original)	SE Forest (final)	Prairie (original)	Prairie (final)	N Forest (original)	N Forest (final)	Total (original)	Total (final)
Restore	0	0	0	0	0	0	0	0	0	0	0	0
Protect in Fee with State PILT Liability	0	0	0	0	0	0	0	0	0	0	0	0
Protect in Fee W/O State PILT Liability	0	0	0	0	0	0	0	0	0	0	0	0
Protect in Easement	0	0	0	0	0	0	0	0	0	0	0	0
Enhance	0	0	0	0	90	292	0	0	0	0	90	292
Total	0	0	0	0	90	292	0	0	0	0	90	292

**Table 4. Total Funding within each Ecological Section**

Type	Metro Urban (original)	Metro Urban (final)	ForestPrairie (original)	Forest Prairie (final)	SE Forest (original)	SE Forest (final)	Prairie (original)	Prairie (final)	N Forest (original)	N Forest (final)	Total (original)	Total (final)
Restore	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Enhance	\$0	\$0	\$0	\$0	\$300,000	\$300,000	\$0	\$0	\$0	\$0	\$300,000	\$300,000
Total	\$0	\$0	\$0	\$0	\$300,000	\$300,000	\$0	\$0	\$0	\$0	\$300,000	\$300,000

**Target Lake/Stream/River Feet or Miles (original)**

0

## Target Lake/Stream/River Feet or Miles (final)

0

### Explain the success/shortage of acre goals:

Enhancement work was completed on over 290 acres, exceeding the target goals. This was due to increasing awareness of additional project opportunities, and some projects (creating canopy gaps, direct seeding) being less expensive than others allowing more work to be completed over larger acreages.

## Parcel List

### Section 1 - Restore / Enhance Parcel List

Goodhue

Name	TRDS	Acres	Total Cost	Existing Protection?	Description
Cannon River Bottoms - state forest	11315216	8	\$20,500	Yes	state forest in Cannon River Bottoms area near Red Wing
Cannon River Collischan Road willow project	11315216	14	\$33,700	Yes	state forest along Cannon River Bottoms near Collischan Road
Dukes Pond, Cannon River Bottoms	11315223	22	\$26,100	Yes	state forest in Cannon River Bottoms area near Red Wing
Gores WMA	11416210	20	\$42,300	Yes	Treat reed canary grass and plant trees
North Clear Lake	11416222	9	\$10,100	Yes	State forest lands along Vermillion/Mississippi River

Houston

Name	TRDS	Acres	Total Cost	Existing Protection?	Description
Root River	10404236	80	\$40,400	Yes	National Wildlife Refuge lands along Mississippi River
Whalen Tract	10104235	55	\$45,200	Yes	National Wildlife Refuge lands along Mississippi River

Wabasha

Name	TRDS	Acres	Total Cost	Existing Protection?	Description
East Indian Creek Delta	10909219	55	\$18,900	Yes	National Wildlife Refuge lands along Mississippi River

Winona

Name	TRDS	Acres	Total Cost	Existing Protection?	Description
Whitewater Delta	10909229	20	\$25,900	Yes	National Wildlife Refuge lands along Mississippi River
Whitewater DNR	10810214	9	\$14,300	Yes	Whitewater Wildlife Management Area

### Section 2 - Protect Parcel List

No parcels with an activity type protect.

#### Section 2a - Protect Parcel with Bldgs

No parcels with an activity type protect and has buildings.

### Section 3 - Other Parcel Activity

No parcels with an other activity type.

## Completed Parcel: Cannon River Bottoms - state forest

# of Total Acres:	8
County:	Goodhue
Township:	113
Range:	15
Direction:	2
Section:	16
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	8
# of Acres: Prairie/Grassland:	
Amount of Shoreline:	
Name of Adjacent Body of Water (if applicable):	
Has there been signage erected at the site:	No - A sign will be put up in spring 2018 when ground thaws.
Total cost of Restoration/Enhancement:	\$20,500

## Completed Parcel: Cannon River Collischan Road willow project

# of Total Acres:	14
County:	Goodhue
Township:	113
Range:	15
Direction:	2
Section:	16
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	14
# of Acres: Prairie/Grassland:	
Amount of Shoreline:	
Name of Adjacent Body of Water (if applicable):	
Has there been signage erected at the site:	Yes
Total cost of Restoration/Enhancement:	\$33,700

## Completed Parcel: Dukes Pond, Cannon River Bottoms

# of Total Acres:	22
County:	Goodhue
Township:	113
Range:	15
Direction:	2
Section:	23
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	22
# of Acres: Prairie/Grassland:	
Amount of Shoreline:	
Name of Adjacent Body of Water (if applicable):	
Has there been signage erected at the site:	Yes
Total cost of Restoration/Enhancement:	\$26,100

## Completed Parcel: East Indian Creek Delta

# of Total Acres:	55
County:	Wabasha
Township:	109
Range:	09
Direction:	2
Section:	19
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	55
# of Acres: Prairie/Grassland:	
Amount of Shoreline:	
Name of Adjacent Body of Water (if applicable):	
Has there been signage erected at the site:	
Total cost of Restoration/Enhancement:	\$18,900

## Completed Parcel: Gores WMA

# of Total Acres:	20
County:	Goodhue
Township:	114
Range:	16
Direction:	2
Section:	10
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	20
# of Acres: Prairie/Grassland:	
Amount of Shoreline:	
Name of Adjacent Body of Water (if applicable):	
Has there been signage erected at the site:	No - The site is very remote and only reachable by boat along the Mississippi River.
Total cost of Restoration/Enhancement:	\$42,300

## Completed Parcel: North Clear Lake

# of Total Acres:	9
County:	Goodhue
Township:	114
Range:	16
Direction:	2
Section:	22
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	9
# of Acres: Prairie/Grassland:	
Amount of Shoreline:	
Name of Adjacent Body of Water (if applicable):	
Has there been signage erected at the site:	Yes
Total cost of Restoration/Enhancement:	\$10,100

## Completed Parcel: Root River

# of Total Acres:	80
County:	Houston
Township:	104
Range:	04
Direction:	2
Section:	36
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	80
# of Acres: Prairie/Grassland:	
Amount of Shoreline:	
Name of Adjacent Body of Water (if applicable):	
Has there been signage erected at the site:	Yes
Total cost of Restoration/Enhancement:	\$40,400

## Completed Parcel: Whalen Tract

# of Total Acres:	55
County:	Houston
Township:	101
Range:	04
Direction:	2
Section:	35
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	55
# of Acres: Prairie/Grassland:	
Amount of Shoreline:	
Name of Adjacent Body of Water (if applicable):	
Has there been signage erected at the site:	No - A sign will be erected in spring 2018 when the ground thaws.
Total cost of Restoration/Enhancement:	\$45,200

## Completed Parcel: Whitewater Delta

# of Total Acres:	20
County:	Winona
Township:	109
Range:	09
Direction:	2
Section:	29
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	20
# of Acres: Prairie/Grassland:	
Amount of Shoreline:	
Name of Adjacent Body of Water (if applicable):	
Has there been signage erected at the site:	No - A sign will be erected in spring 2018 when the ground thaws.
Total cost of Restoration/Enhancement:	\$25,900

## Completed Parcel: Whitewater DNR

# of Total Acres:	9
County:	Winona
Township:	108
Range:	10
Direction:	2
Section:	14
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	9
# of Acres: Prairie/Grassland:	
Amount of Shoreline:	
Name of Adjacent Body of Water (if applicable):	
Has there been signage erected at the site:	Yes
Total cost of Restoration/Enhancement:	\$14,300

# Parcel Map

## Floodplain Forest Enhancement - Mississippi River

