



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

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**Date of Report:** December 4, 2015

**Date of Next Status Update Report:** January 1, 2017

**Date of Work Plan Approval:**

**Project Completion Date:** June 30, 2018

**Does this submission include an amendment request?** No

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**PROJECT TITLE:** Analysis of Thermally Modified Wood Nesting Boxes for Birds

**Project Manager:** Ryan Hueffmeier

**Organization:** Natural Resources Research Institute

**Mailing Address:** 5013 Miller Trunk Highway

**City/State/Zip Code:** Duluth, MN 55811

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**Email Address:** rhueffme@d.umn.edu

**Web Address:** www.nrri.umn.edu

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**Location:** Statewide

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**Total ENRTF Project Budget:**

**ENRTF Appropriation:** \$117,000

**Amount Spent:** \$0

**Balance:** \$117,000

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**Legal Citation:** M.L. 2016, Chp. xx, Sec. xx, Subd. xx

**Appropriation Language:**

**I. PROJECT TITLE: Analysis of Thermally Modified Wood Nesting Boxes for Birds**

**II. PROJECT STATEMENT:**

Many of Minnesota’s abundant wood species have inadequate durability (i.e., resistance to rot/decay) for many exterior applications. Thermal modification uses controlled heating of lumber in a low- or no-oxygen environment to impart advantageous properties, including increased moisture resistance, improved dimensional stability, and increased resistance to rot/decay. Thermal modification has strong potential to transform low-value, underutilized wood species with historically poor outdoor performance into new materials with exterior performance rivaling that of imported Western red cedar, cypress, and other tropical hardwoods. In addition, it is an effective treatment for timber affected by the Emerald Ash Borer (EAB), rendering ash wood safe for transport and being manufactured into value-added products.

Bird-centered retail outlets, nature centers, and environmental learning centers (ELCs) across Minnesota are requesting thermally-modified nest boxes for breeding birds. However, before these nest boxes can be distributed commercially, their exterior performance needs to be verified. In this project UMD NRRI will construct a series of bird nest boxes from thermally modified ash species harvested in Minnesota. The goals of the proposed project are to:

1. Test the exterior performance of thermally modified ash wood by placing 500 nest boxes at nature and environmental learning centers, and Minnesota School Forests for use in student and citizen science-based nest box monitoring and environmental education programs.
2. Collect relevant Minnesota bird data as a contribution to Cornell University’s nationwide NestWatch project. The resulting exterior performance data generated from the nest boxes will be used to optimize nest box construction and finishing methods, raise public awareness of the material, and create a Minnesota-based non-profit to supply nature and environmental centers, schools, and retail stores with nest boxes and other wildlife housing and feeding equipment to support ongoing conservation programs across the State.

**III. OVERALL PROJECT STATUS UPDATES:**

**Project Status as of January 1, 2017:**

**Project Status as of July 1, 2017:**

**Project Status as of January 1, 2018:**

**Overall Project Outcomes and Results:**

**IV. PROJECT ACTIVITIES AND OUTCOMES:**

**ACTIVITY 1: Nest box construction**

**Description:**

Nest box kits (500) will be constructed at UMD NRRI from regional ash species harvested from areas threatened by EAB and thermally modified in the UMD NRRI’s Thermal Modification Pilot Plant. Kits will be designed and prepared according to specifications from *Woodworking for Wildlife, 3<sup>rd</sup> Edition* by Carrol L. Henderson, MN DNR publication and targeted toward bird species of greatest conservation interest or particular interest of workshop naturalists, instructors, and participants.

Data collection protocol materials will be prepared to ensure accurate collection of NestWatch and wood performance data by workshop participants.

**Summary Budget Information for Activity 1:**

**ENRTF Budget: \$ 56,415**  
**Amount Spent: \$ 0**

Balance: \$ 56,415

Outcome	Completion Date
1. Five hundred nest box test kits produced	November 30, 2016
2. Fifty packets with protocols for bird, wood data, and nest box placement created	November 30, 2016

Activity Status as of January 1, 2017:

Activity Status as of July 1, 2017:

Activity Status as of January 1, 2018:

Final Report Summary:

**ACTIVITY 2: Nest box workshops, distribution, and placement**

**Description:**

Workshops will be conducted statewide where nest boxes and data collection protocol materials will be delivered to nature and environmental learning centers and Minnesota School Forests. Nest boxes will be sited in the field as part of workshops delivered by naturalist staff and teachers and logged into the online database at NestWatch.org by late winter 2017.

**Summary Budget Information for Activity 2:**

ENRTF Budget: \$ 26,604  
Amount Spent: \$ 0  
Balance: \$ 26,604

Outcome	Completion Date
1. 12 workshops held throughout state (2 in each of 6 regions)	March 31, 2017
2. 500 nest boxes distributed and placed at 20 locations	April 31, 2017

Activity Status as of January 1, 2017:

Activity Status as of July 1, 2017:

Activity Status as of January 1, 2018:

Final Report Summary:

**ACTIVITY 3: Data collection and reporting**

**Description:**

Under the guidance of naturalist staff and teachers, nest boxes will be monitored throughout two bird breeding seasons, spring and summer 2017 and 2018. The collected data will include nest box occupation with identification of species, breeding success, and exterior performance of the nest box. The bird-related data will be entered into the NestWatch.org database, and wood performance data collection sheets and a representative sample of the nest boxes will be returned to NRRI for analysis.

**Summary Budget Information for Activity 3:**

ENRTF Budget: \$ 33,981  
Amount Spent: \$ 0  
Balance: \$ 33,981

Outcome	Completion Date
1. Generate performance data from 500 nest boxes.	June 30, 2018

2. Enter bird data from 20 sites (representing Minnesota bird species over 2 breeding seasons) into the NestWatch.org database	June 30,2018
3. Prepare report detailing the exterior performance of the thermally-modified ash species, and make recommendations for market readiness	June 30, 2018

**Activity Status as of January 1, 2017:**

**Activity Status as of July 1, 2017:**

**Activity Status as of January 1, 2018:**

**Final Report Summary:**

**V. DISSEMINATION:**

**Description:**

Project information will be disseminated through citizen science and school workshops, advertised via social media websites and newsletters associated with workshop venues, a project specific website linked to the main website of the Natural Resources Research Institute ([www.nrri.umn.edu](http://www.nrri.umn.edu)) will be created, and formal presentations made at Forest Products, Environmental Education, and Wildlife Conservation related conferences.

**Status as of January 1, 2017:**

**Status as of July 1, 2017:**

**Status as of January 1, 2018:**

**Final Report Summary:**

**VI. PROJECT BUDGET SUMMARY:**

**A. ENRTF Budget Overview:**

Budget Category	\$ Amount	Overview Explanation
Personnel:	\$ 72,824	1 project manager at 20% FTE each year for 2 years (\$18,200); 3 co-managers, 2 at 15% FTE each year for 2 years (Sue French: \$16,200; Ed Zlonis: \$16,600; \$32,800 total), and 1 at 1% FTE each year for 2 years (Matthew Aro: \$2,700); 1 field technician at 20% FTE each year for 2 years (\$11,524); 1 undergraduate student with 9-month appointment at 15% FTE for year 1 and 10% FTE for year 2 (\$5,200); administrative support staff at 2% FTE each year for 2 years (\$2,400).
Equipment/Tools/Supplies:	\$ 6,300	Ash lumber (\$3,600); spy cameras (\$2,700)
Printing:	\$ 500	Nest watch materials and park flyers
Travel Expenses in MN:	\$ 13,076	Mileage (\$6,056); vehicle use fee (\$480); lodging (\$3,320); Meals (\$3,220)
Other:	\$ 24,300	Workshop space rental (\$1,200); shipping (\$3,600); kiln use (\$19,500)
<b>TOTAL ENRTF BUDGET:</b>	<b>\$ 117,000</b>	

**Explanation of Use of Classified Staff:** Project funding will provide partial support for full-time classified staff who is uniquely qualified to complete tasks required for this project. During the time that a portion of the employee’s time is redirected to work on this project, their responsibilities will be back-filled by temporary staff who do not have the skills needed to complete tasks for this project.

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

**Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation:** 2 FTEs

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

**B. Other Funds:**

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
<b>Non-state</b>			
Citizen volunteers (in-kind support)	\$ 3,200	\$ 0	Volunteers (4 anticipated) will lead educational activities to support successful completion of the project.
Nature Center volunteers	\$ 1,600	\$ 0	Volunteers will provide time to support successful completion of project
<b>State</b>			
Foregone F&A (52% MTDC)	\$ 60,840	\$ 0	Indirect costs on personnel, travel, supplies, and other expenses related to work on the sponsored project
<b>TOTAL OTHER FUNDS:</b>	<b>\$ 65,640</b>	<b>\$ 0</b>	

**VII. PROJECT STRATEGY:**

**A. Project Partners:**

Team:

Sue French, Wood Scientist, UMD NRRI. Role: develop thermally modified wood materials, construct nest box kits, analyze wood performance data.

Ed Zlonis, Ornithologist, UMD NRRI. Role: to identify targeted bird species by location, analyze bird data.

Matt Aro, Research Fellow, UMD NRRI. Role: perform thermal modification, analyze wood data.

Ryan Hueffmeier, Scientist/Environmental Educator, UMD NRRI. Role: deliver workshops at Hartley Nature Center, Sax-Zim, and others, provide environmental education support, coordinate data collection with naturalists and teachers.

Partners:

Robyn Bailey, Project Leader, NestWatch/The Cornell Lab of Ornithology. Role: provide support in integration of collected bird data into existing NestWatch database.

Kurt Mead, Naturalist, Tettegouche State Park. Role: deliver workshops at Tettegouche.

Peter Harris, Science Projects Coordinator, Wolf Ridge ELC. Role: oversee delivery of environmental education programs at Wolf Ridge.

Alexis Grinde, Ornithologist/Biology Instructor, Pine Technical and Community College. Role: deliver workshops at Pine Technical and Community College.

**B. Project Impact and Long-term Strategy:**

The long-term strategy of the project is to generate sufficient exterior performance data for the optimization of nest boxes manufactured from thermally modified ash species for successful commercialization. The resulting Minnesota-based small business (potentially started through the Cultural Entrepreneurship Program at UMD)

will manufacture wildlife housing and feeding equipment, targeting birds and other threatened native species, such as bats and bees, with profits used to support the ongoing and increased delivery of conservation and citizen-science workshops across the state.

**C. Funding History:** N/A

**VIII. FEE TITLE ACQUISITION/CONSERVATION EASEMENT/RESTORATION REQUIREMENTS:**

**A. Parcel List:** N/A

**B. Acquisition/Restoration Information:** N/A

**IX. VISUAL COMPONENT or MAP(S):** See attached.

**X. RESEARCH ADDENDUM:** N/A

**XI. REPORTING REQUIREMENTS:**

Periodic work plan status update reports will be submitted no later than January 1, 2017; July 1, 2017; and January 1, 2018. A final report and associated products will be submitted between June 30 and August 15, 2018.

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



**Project Title:** Analysis of Thermally Modified Wood Nesting Boxes for Birds

**Legal Citation:** M.L. 2016, Chp. xx, Sec. xx, Subd. xx

**Project Manager:** Ryan Hueffmeier

**Organization:** Natural Resources Research Institute, University of Minnesota Duluth

**M.L. 2016 ENRTF Appropriation:** \$117,000

**Project Length and Completion Date:** 2 Years, June 30, 2018

**Date of Report:** 12/04/2015

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
<b>BUDGET ITEM</b>	<b>Nest box construction and placement</b>			<b>Nest box workshops, distribution, and</b>			<b>Data collection and reporting</b>				
<b>Personnel (Wages and Benefits)</b>	\$28,915	\$0	\$28,915	\$18,266	\$0	\$18,266	\$25,643	\$0	\$25,643	\$72,824	\$72,824
Ryan Hueffmeier, Project manager: \$18,200 (72.6% salary, 27.4% benefits); 20% FTE each year for 2 years											
Sue French, Co-manager: \$16,200 (72.6% salary, 27.4% benefits); 15% FTE each year for 2 years											
Ed Zlonis, Co-manager: \$16,600 (66.3% salary, 33.7% benefits); 15% FTE each year for 2 years											
Matthew Aro, Co-manager: \$2,700 (66.3% salary, 33.7% benefits); 1% FTE each year for 2 years											
Field Technician: \$11,524 (92.1% salary, 7.9% benefits); 20% FTE each year for 2 years											
Undergraduate student: \$5,200 (100% salary, 0% benefits); 15% 9-mo appt for year 1, 10% year 2											
Administrative support: \$2,400 (72.6% salary, 27.4% benefits); 2% FTE each year for 2 years											
<b>Equipment/Tools/Supplies</b>											
Ash lumber; 3 cords at \$1,200 each	\$3,600	\$0	\$3,600							\$3,600	\$3,600
Nest box spy cameras: \$108 ea x 25 units	\$2,700	\$0	\$2,700							\$2,700	\$2,700
<b>Printing</b>											
Publication costs for nest watch materials and park flyers	\$500	\$0	\$500							\$500	\$500
<b>Travel expenses in Minnesota</b>											
Mileage \$6056 (5267 mi/yr * \$0.575/mi * 2 yrs) + vehicle fee \$480 (\$10/day * 48 days)				\$3,268	\$0	\$3,268	\$3,268	\$0	\$3,268	\$6,536	\$6,536
Lodging ( 2 ppl w/ 2 rooms traveling 20 nights * \$83/night)				\$1,660	\$0	\$1,660	\$1,660	\$0	\$1,660	\$3,320	\$3,320
Meals (2 people, 40 days, estimated \$40.25/day)				\$1,610	\$0	\$1,610	\$1,610	\$0	\$1,610	\$3,220	\$3,220
<b>Other</b>											
Workshop space \$600 each yr rental fee for 2 yrs	\$1,200	\$0	\$1,200							\$1,200	\$1,200
Kiln charge: 26 loads at \$750 each load	\$19,500	\$0	\$19,500							\$19,500	\$19,500
Shipping: 100 school forests x \$18/box shipping cost each yr for 2 yrs (three birdhouses in each box)				\$1,800	\$0	\$1,800	\$1,800	\$0	\$1,800	\$3,600	\$3,600
<b>COLUMN TOTAL</b>	<b>\$56,415</b>	<b>\$0</b>	<b>\$56,415</b>	<b>\$26,604</b>	<b>\$0</b>	<b>\$26,604</b>	<b>\$33,981</b>	<b>\$0</b>	<b>\$33,981</b>	<b>\$117,000</b>	<b>\$117,000</b>

According to the Minnesota DNR ~1 BILLION Ash trees are in Minnesota. Largest concentration in the country.



Emerald Ash Borer has killed millions of trees across the country.



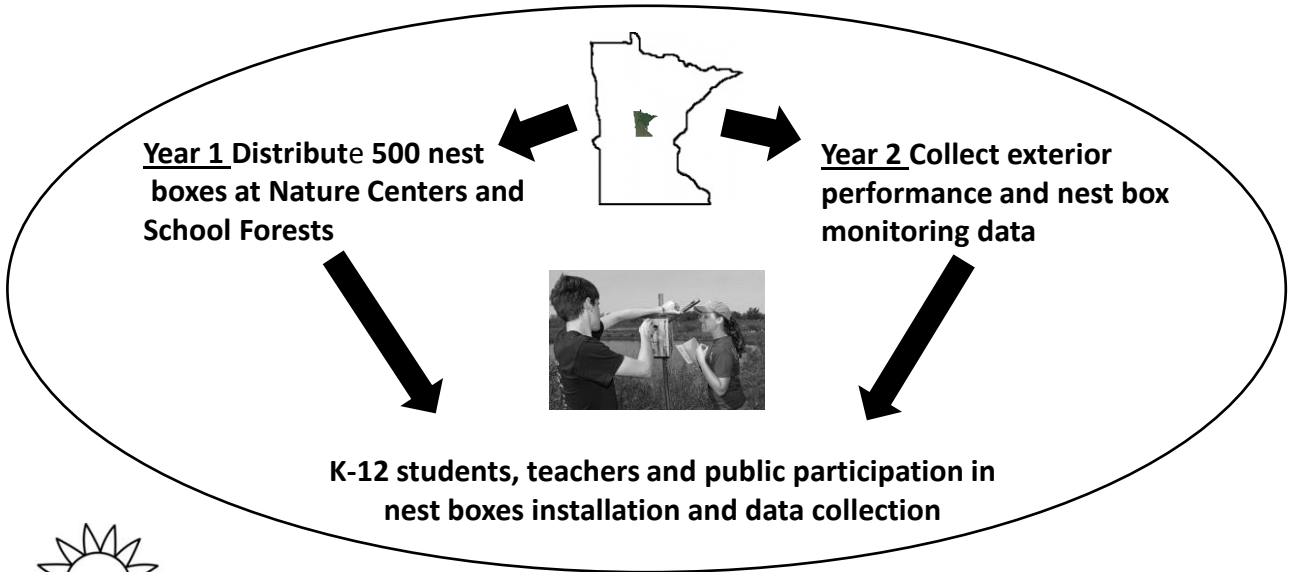
Thermal modification through pressure and heat can make low value species such as infested Ash trees safe to be moved and manufactured.



Value added products can be created such as thermally modified nest boxes



Public Participatory Data Collection on nest box performance and bird activities



Outcomes



• Data on the exterior performance of nest boxes

• Small-scale pilot with expanded "product line" to include bees and bats

Foundational Natural Resource Data

02/19/2016



• Bird conservation Data in partnership with NestWatch

Sub 05k - DRAFT  
Foundational Resource, conservation, and environmental literacy