

**Environment and Natural Resources Trust Fund  
2015 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 113-E**

BMP Portfolio for Non-forest Biomass for Bioenergy

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**Category:** E. Air Quality, Climate Change, and Renewable Energy

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**Total Project Budget:** \$ 213,250

**Proposed Project Time Period for the Funding Requested:** 1.5 years, July 2015 - December 2016

**Summary:**

We will construct a new comprehensive, holistic, and science based Minnesota BMP portfolio for sustainable planting, managing and harvesting of non-forest biomass for bioenergy.

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**Location**

**Region:** Statewide

**County Name:** Statewide

**City / Township:**

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**Alternate Text for Visual:**

Location of sites in the state where relevant research has been completed

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	



**Environment and Natural Resources Trust Fund (ENRTF)**  
**2015 Main Proposal**  
**Project Title: BMP Portfolio for Non-forest Biomass for Bioenergy**

**PROJECT TITLE: BMP Portfolio for Non-forest Biomass for Bioenergy**

**I. PROJECT STATEMENT**

We will construct a new comprehensive, holistic, and science based Minnesota BMP portfolio for sustainable planting, managing and harvesting of non-forest biomass for bioenergy including nine herbaceous annual and five perennial crops (plus native grasses and forbs), certain residues of these crops, and six short rotation woody crops which are now (or are likely to be in the future) cultivated in Minnesota as feedstock for bioenergy, biofuel, or biochemical products. *The new BMP will emphasize management practices which avoid invasive species and protect and improve soil and water quality as well as wildlife and biodiversity while producing a sustainable biomass feedstock.*

**History:** Minnesota has been progressive in creating opportunities for renewable energy and guidelines for sustainable harvest of forests and brushlands. Minnesota was one of the first states to create Voluntary Site-Level Forest Management Guidelines and Best Management Practices for Managing Brushlands. Together they constitute a Minnesota BMP portfolio for harvesting brush and wood. In the original renewable electricity mandate, the Legislature clearly defined forest residues and certain harvested brush as renewable woody biomass for the production of electric energy and associated the definitions with these BMPs. Since then, they have come to be voluntarily included as performance criteria in wood and brush harvesting contracts, thus, bringing the environmentally protective language of the BMPs into the daily work of managing the forest on the ground. *We will extend this successful model into the realm of non-forest biomass for bioenergy creating new opportunities to improve the management of Minnesota resources for the benefit of the environment, renewable energy and productive conservation.*

**Bioenergy Status:** The State is encouraging the distributive generation of electricity requiring the use not only of wood and brush, but non-forest biomass. Cellulosic biofuel is yet to achieve commercial viability; however, three large-scale production plants are planned to go online in 2014 in other states of the Upper Midwest. Biojet fuel is nearing commercial status. Biochemical producers are already replacing fossil feedstocks with biomass including non-forest biomass. Pressure is increasing to produce thermal energy from biomass. The State has an opportunity to get out ahead of new these developments with environmentally protective non-forest biomass statutes. *However, the lack of a BMP portfolio for non-forest biomass, analogous to the BMP portfolio for wood and brush, hinders, if not prevents, proper legislative initiative.*

Now is a particularly opportune time to develop a portfolio for non-forest biomass. Over the last 5-6 years millions of state and federal dollars have been invested in research to understand the impact of non-forest biomass establishment, management and harvest on the environment in Minnesota. Synthesizing these results into a clear, comprehensive product is the next step to responsible management and utilization of non-forest biomass for renewable energy. The project PI's have led or been actively involved in many of these previous studies, and have established a network of researchers, natural resource managers, producers, end-users, and state and federal practitioners which can serve as a resource for this project. In addition, BMP's have been developed in other parts of the country that also provide important information. Using the research results and synthesis from Minnesota combined with other relevant research from other states provides a unique opportunity to design science based BMP's.

A vigorous stakeholder process was integral to the success of the wood and brush BMPs, validating and gaining voluntary acceptance of them. The Best Management Practices Portfolio for Non-forest Biomass will also be vetted by a diverse stakeholder group prior to publication. The Center for Integrated Natural Resources and Agricultural Management (CINRAM) will utilize the stakeholder team to validate the Portfolio, increase understanding of the practical effects of best practices, and promote acceptance of the material.

To ensure balanced and diverse input, the stakeholder team shall include members representing the interests of the bioenergy industry; wildlife, environmental, and conservation groups; and groups with a broad interest in the life and culture of agricultural communities. The team shall include at least: A representative of corn growers in the state; a second representative of bioenergy crop growers in the state; two statewide farm organizations; a representative from a statewide organization representing bioenergy users in the state; two representatives from



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organizations representing environmental interests in the state; a representative from an organization representing the interests of management of game species; two representatives from statewide habitat conservation organizations; a representative of a labor organization with membership having an interest in sustainable agriculture; a representative of an organization with a main interest in agricultural policy; a representative of a statewide sustainable farming organization; a representative of a statewide organization or a sustainable healthy and economically viable rural society. Legislators participating in the stakeholder meetings and representatives of State, Federal, and University Agencies or Departments shall serve ex-officio.

**II. PROJECT ACTIVITIES AND OUTCOMES**

**Activity 1:** *Review and synthesis of existing research and guidelines related to the establishment, management and harvest of non-forest biomass.* **Budget: \$ 64,750**

Outcome	Completion Date
1. <i>Synthesis report of the existing research</i>	<i>December 2015</i>
2. <i>Summary of existing guidelines/BMP's for non-forest biomass establishment, management and harvest</i>	<i>December 2015</i>

**Activity 2:** *Development of draft BMP's for Minnesota* **Budget: \$ 64,750**

Outcome	Completion Date
1. <i>Draft BMP's prepared.</i>	<i>June 2016</i>

**Activity 3:** *Stakeholder process to prepare final BMP's. We will work with stakeholders to develop final BMP's followed by publication..* **Budget: \$ 83,750**

Outcome	Completion Date
1. <i>Final BMP's published</i>	<i>December 2016</i>

**Note:** We will be consulting with stakeholders throughout the process from project initiation with the more formal stakeholder process in the last 6 months of the project.

**III. PROJECT STRATEGY**

**A. Project Team/Partners (Dr. Sheaffer will receive no salary funding)**

**Dr. Dean Current** will provide overall direction and management of the project.

**Dr. Craig Sheaffer** will provide expertise in the planting, management and harvest operation.

**Dr. Jacob M. Jungers** will carry out literature review and preparation of BMP documents.

**B. Project Impact and Long-Term Strategy**

1. As a voluntary, comprehensive, and holistic document, the new BMP portfolio will be comfortably embraced as an environmentally sensitive standard in legislation for non-forest biomass for bioenergy.
2. Specific legislation to fill statutory gaps relating to the environmentally sound use of non-forest biomass in the production of bioenergy, biofuels, and biochemicals is currently stymied by the absence of a BMP portfolio with which the farm raised biomass can be properly associated. That situation will be remedied with the new BMP portfolio.
3. Importantly it is expected that, under the imprimatur of the Legislature, the new portfolio will come to be commonly employed in biomass aggregation contracts between bioenergy firms and growers as performance criteria, thus inserting real environmental impacts into the day to day business of bioenergy.
4. A future effort will build on the stakeholder process with a focus on education of bioenergy producers and growers alike to the use and value of environmentally sensitive performance criteria. This may require additional funding in the future. Funds will be sought once the current phase is complete.
5. Application of the BMP portfolio will lead to improvements in environmental quality and services while providing economic opportunities for the state.

**C. Timeline Requirements**

All work will be completed in 18 months.

## 2015 Detailed Project Budget

**Project Title:** BMP Portfolio for Non-forest Biomass for Bioenergy

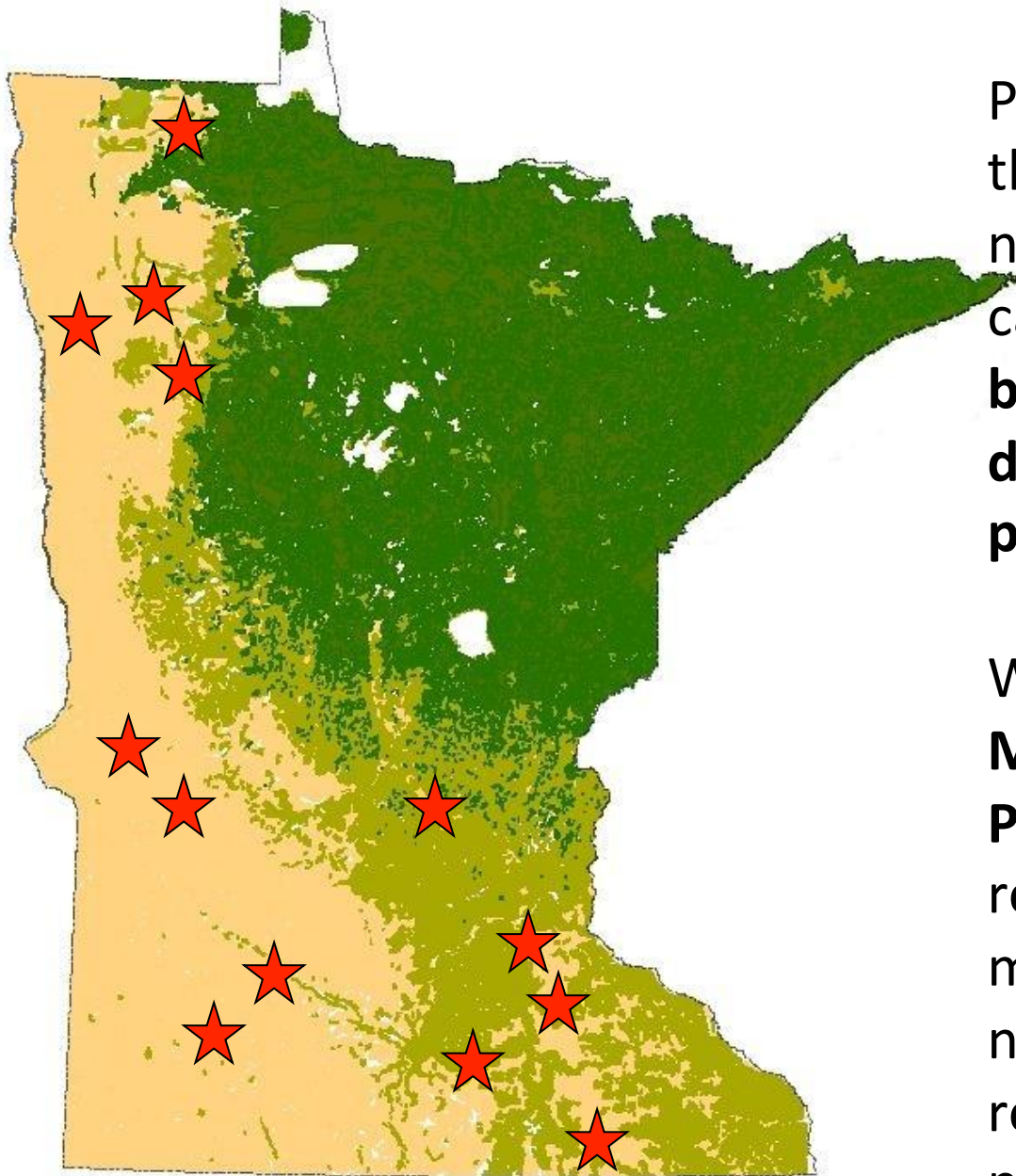
### IV. TOTAL ENRTF REQUEST BUDGET 1.5 years

<u>BUDGET ITEM</u>	<u>AMOUNT</u>
<b>Personnel:</b> Dean Current, PI and Research Associate, 0.23 FTE (33.6% fringe) for 1.5 years, will be responsible for coordination of the project and stakeholder process.	\$ 37,500
Jacob Jungers, Research Associate, 1.0 FTE (33.6% fringe) for 1.5 years, will be responsible for literature review and developing of guidelines and BMP portfolio.	\$ 90,000
TBD, Graduate Research Assistant, 0.5 FTE (Fringe: \$17.32/hr tuition, 15.7% health insurance, 7.4% summer FICA) for 1.5 years, will assist with the gathering of information on best practices and preparing the portfolio of BMPs.	\$ 60,000
<b>Contracts:</b> Professional Meeting Facilitator to facilitate stakeholder meetings to establish voluntary guidelines for the establishment, management and harvest of non-wood biomass.	\$ 15,000
<b>Travel:</b> In-state travel to work with stakeholders either individually or in groups. Estimate a total of 45 trips of ~300 average miles per trip at ~\$0.50/mile.	\$ 6,750
<b>Additional Budget Items:</b> Stakeholder meeting expenses (includes room rental fees, refreshments, printing materials, general meeting supplies, etc.)	\$ 4,000
<b>TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =</b>	<b>\$ 213,250</b>

### V. OTHER FUNDS

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
<b>Other Non-State \$ To Be Applied To Project During Project Period:</b>	N/A	
<b>Other State \$ To Be Applied To Project During Project Period:</b>	N/A	
<b>In-kind Services To Be Applied To Project During Project Period:</b> Co-PI Craig Sheaffer will contribute 0.01 FTE for the duration of the project.	\$ 3,078	Secured
Unrecovered indirect costs @ 52% of modified total direct cost base of \$188,050	\$ 97,786	Secured
<b>Funding History:</b>	N/A	
<b>Remaining \$ From Current ENRTF Appropriation:</b>	N/A	

# Locations of previous research on non-forest biomass



Previous research has found that proper management of non-woody biomass crops can **increase native biodiversity, reduce carbon dioxide emissions, and protect water resources.**

We will produce a **Best Management Practices Portfolio** to ensure responsible establishment, management, and harvest of non-woody biomass for renewable energy and products in Minnesota.

## **Project Manager Qualifications and Organization Description**

Dr. Dean Current is the Program Director of Center for Integrated Natural Resources and Agricultural Management (CINRAM) at UMN. CINRAM is a partner-based organization that catalyzes the development and adoption of integrated land use systems. CINRAM links the expertise of the University of Minnesota with the experience and insights of people and organizations who work with, and have an understanding of, opportunities and issues across the landscape. CINRAM is an interdisciplinary center that works across disciplines in the College of Food Agriculture and Natural Resource Sciences as well as other colleges across the University as needed while working closely with outstate and non-university partners.

Dr. Current focuses his research on community based natural resource management, community forestry, agroforestry, market based conservation, economic and environmental impact assessment, multifunctional agriculture, payments for environmental/ecosystem services, and biomass energy options. He manages a portfolio of interdisciplinary projects involving University researchers, local watershed groups, state and federal agency representatives as well as international researchers and organizations dealing with biomass energy production and processing, carbon sequestration, market-based approaches to integrated watershed management for environmental and economic benefits as well as market based approaches to forest and ecosystem conservation. He also serves as a consultant for many companies/organizations.

Dr. Current was PI with Dr. Lee Frelich for an Initiative for Renewable Energy and the Environment sponsored project titled “Research Assessment for the Development of Principles for the Removal of Woody Biomass from Forests and Brushland” and PI for the BWSR sponsored project, “Scoping Study: Pricing and contract structure procedures for Minnesota Clean Energy RIM Reserve Program”. He was also PI for the Xcel Renewable Development Fund project “Lowering the Cost of Bio-energy Feedstocks while Providing Environmental Services – A Win-Win Opportunity” which included analysis of the impact of biomass plantings on birds and small mammals. The collaborating UMN departments offer unique and complementing expertise and experience which will ensure that the proposed work will be properly carried out and the set of objectives will be successfully delivered.