



# Environment and Natural Resources Trust Fund (ENRTF) M.L. 2017 LCCMR Work Plan

**Date of Submission:** September 14, 2016

**Date of Next Status Update Report:** January 1, 2018

**Date of Work Plan Approval:** 06/07/2017

**Project Completion Date:** June 30, 2020

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

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**PROJECT TITLE:** Economic Assessment of Precision Conservation and Agriculture

**Project Manager:** Tanner Bruse

**Organization:** Pheasants Forever

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**Location:** Ag matrix of MN (NW, W, WC, C, SW, S and SE)

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**Total ENRTF Project Budget:**

**ENRTF Appropriation:** \$400,000

**Amount Spent:** \$0

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**Balance:** \$400,000

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**Legal Citation:** M.L. 2017, Chp. 96, Sec. 2, Subd. 08j

**Appropriation Language:**

\$400,000 the first year is from the trust fund to the commissioner of natural resources for an agreement with Pheasants Forever to demonstrate a new approach to promote conservation practices utilizing return-on-investment analysis and identifying revenue-negative acres on agricultural land to assist farmers in implementing conservation practices that will provide environmental and economic benefits. This appropriation is available until June 30, 2020, by which time the project must be completed and final products delivered.

## **I. PROJECT TITLE: Precision Conservation and Agriculture: Growing Green<sup>2</sup> Together**

### **II. PROJECT STATEMENT:**

With recent advancements of real-time yield monitoring combined with substantial declines in commodity prices it has been demonstrated that, on many farms, 3-15% of cropped acres cost money to farm (revenue negative acres). This proposal will foster an unprecedented level of cooperation between agriculture and conservation. It will accelerate conservation delivery, by applying cutting-edge precision technology and ag-business planning principles, to identify areas that make sense for farmers to apply conservation practices. By utilizing technology and return on investment (ROI) precision agriculture software, such as but not limited to; AgSolver's Profit Zone Manager (PZM), we are able to look at subfield planning (acre by acre) to identify areas in a field that consistently cost money to farm, year after year, no matter the uncontrollable variables. Traditional views have been based on whole farm or whole enterprise levels which doesn't take into consideration that every single acre performs differently. Previous perceptions are that profitability and environmental performance are competitive. By using technology and data already being collected, analyzing every single acre independently, we find that by increasing profitability we also gain positive environmental performance.

By using this technology and business planning concept we will demonstrate a new return-on-investment (ROI) approach to precision conservation by sourcing approximately 5,000-8,000 acres for conservation implementation to guide new and additive opportunities to maximize water and land stewardship decisions. Using this innovative approach, we will work in the agricultural matrix of Minnesota to provide conservation acres on the landscape that are beneficial to water quality and wildlife while maintaining individual farm profitability. This project will work with approximately 160 Minnesota farmers, analyze approximately 80,000 acres, identifying revenue negative acres to show how implementing conservation may actually increase profitability for the farmer while providing soil, water and wildlife benefits. While working with Minnesota farmers, analyzing their entire operations acre by acre, opportunities for State, Federal, local and individual working lands programs can be used to increase on farm profitability. Using Federal programs such as the conservation reserve program (CRP), environmental quality incentive program (EQIP) and conservation stewardship program (CSP) can be used to best place grassland practices and utilize working lands (cost share) initiatives that are mutually beneficial for sustainability and economic performance.

It has become increasingly apparent that meeting our State's water quality and habitat goals will require adoption of thousands of acres of perennial vegetation combined with innovative conservation practices. With that in mind we will test a pilot that provides cost share on seed, seeding recommendations and maintenance information to provide an alternative option to traditional programs such as CRP. This program will have a shorter contract duration and be less restrictive while still providing environmental and wildlife benefits. While state and federal programs, such as CRP and RIM are important, we believe it's equally important to provide working lands opportunities to the producer. Working lands, such as pasture restoration, can benefit profitability by diversifying working capital and provide tremendous wildlife habitat along with water quality benefits when done correctly. This pilot is based on sustainability and generating additional acres, beyond the traditional program enrollment, to benefit water quality, soil health, wildlife habitat and producers bottom lines.

We will contract out the work to create an online profitability map. This map will be based on both soil types and economic performance to provide an interactive tool for conservation professionals and others to determine areas that best suites the farmer to install conservation based on profitability. This web based map will be available to the public. By using this map in conjunction with previous tools such as the environmental benefits index (EBI), we can find common places to implement conservation that provide the greatest benefit for conservation and take into consideration the potential willingness of the farmer to install on identified acres.

Working with the farmer to implement conservation on acres that will increase his or her bottom line will set a new standard for conservation and agriculture working together in MN. This innovative process, mapping and

working lands program will have the ability to work with new farmers, new partners and showcase mutually beneficial scenarios. This project will give guidance to the incentives necessary for installation of conservation practices, a need for alternative working lands programs and source acres not previously considered for conservation.

**III. OVERALL PROJECT STATUS UPDATES:**

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

**Project Status as of July 1 2018:**

**Project Status as of January 1 2019:**

**Project Status as of July 1 2019:**

**Project Status as of January 1 2020:**

**Project Status as of July 1 2020:**

**Overall Project Outcomes and Results:**

**IV. PROJECT ACTIVITIES AND OUTCOMES:**

**ACTIVITY 1:**

**Description:**

Two precision planning specialists, with an education in agriculture (ag business, precision ag, agronomy), will be hired and trained to work directly with approximately 160 Minnesota farmers along with retail ag businesses. The goal is to source approximately 5,000-8,000 acres for conservation implementation while still maintaining farm profitability. This new economic approach will test the viability of identifying new acres for conservation to achieve water, soil and wildlife outcomes. By working with ag-business, getting this concept into other offices, such as co-ops, consultant offices and ag-retail space it will create a paradigm shift of collaboration between agriculture and conservation by focusing on technology and concentrating on the dollars and cents of conservation delivery. Spreading this message, collaboration with conservation and agriculture entities and promoting this concept will be a very important component to help amplify results. Once acres have been analyzed by the specialist they will work with the grower to identify land use goals and bring the farmer to conservation professionals to explore program options (See attached graphic: Precision Ag Business Planning Cycle). This ability to walk them through the entire process, bringing customer service full circle, provides the best opportunity to see conservation delivered on the landscape along with generating an increase in working capital for the farmer.

We will conduct 14 outreach, demonstration and workshops to showcase successes, provide educational experiences and display this innovative approach showcasing opportunities for producers to be sustainable both environmentally and economically. These ROI planning workshops will involve a wide audience to include growers, conservation professionals, ag business and other individuals/groups, such as ag lenders, to demonstrate how universal this program and process is and how it is mutually beneficial. Creating discussion amongst growers is crucial to generating coffee shop talk and creating the domino effect within local communities to expand the use of this innovative approach. Over the course of this project we will attend farm fest annually to engage agriculture communities and showcase successful results to both promote and implement this concept, in turn, amplifying results.

We will test a working lands program with interested producers providing cost share on seed. This working lands program will be less restrictive than current state and federal programs and also provide a shorter contract duration. By making it less restrictive and a shorter contract duration it should provide an intriguing option for producers and source acres that traditionally had no consideration for a conservation practice. The reality is that while state and federal programs are extremely important we feel it's equally important to create a program that pays less but in turn is favorable to operations interested in working lands alternatives. By implementing a working lands pilot, it will help determine incentives necessary to implement conservation on revenue negative acres that traditionally drew no previous attention.

We will contract out the creation of an online profitability map. This map of Minnesota will be an interactive tool for conservation professionals and others to determine areas that best suites the farmer to install conservation based on profitability. This web based map will be available to the public. This map will show estimates of profitability of fields in corn or soybean. This map will be meant to provide insight into alternative land management to improve farm profitability using publicly available data. While useful for insight into relative performance of areas within fields this map will not contain individual economic or management data, and actual profitability will depend on actual expenses, revenue and management. Local variations of yields, management and marketing practices, land tenure, and underlying spatial data result in deviations from the estimates that will be produced by the map. By using this map in conjunction with previous tools such as the environmental benefits index (EBI), we can find common places to implement conservation that provide the greatest benefit for conservation and take into consideration the potential willingness of the farmer to install on identified acres.

**Summary Budget Information for Activity 1:**

**ENRTF Budget: \$ 400,000**  
**Amount Spent: \$ 0**  
**Balance: \$ 400,000**

<b>Outcome</b>	<b>Completion Date</b>
1. 2 Precision Specialists to conduct planning with ~160 farmers on ~80,000 acres to source ~5,000-8,000 acres to implement conservation practices that increase ROI and have a positive environmental impact.	June 30, 2020
2. Engage the retail sector of agri-business including agronomists, independent crop advisers, seed dealers, absentee land managers, ag lending, co-ops and other key partners. Gain support from different ag based businesses and groups to show the connection between ag and conservation.	June 30, 2020
3. Conduct demonstration events/workshops and host a booth at Farm Fest to demonstrate how bottom lines can be increased by utilizing the precision planning process as well as promote, implement and amplify results of conservation implementation on revenue negative acres.	June 30, 2020
4. Test the viability of a pilot working lands conservation program that provides additional opportunities for conservation by offering a shorter term (3-6 years) and less restrictive program that offers cost share assistance.	June 30, 2020
5. Create a publicly accessible, web-based, statewide profitability map based on soil types and economics to identify acres that are currently generating a negative return to identify acres that make sense to a farmer for conservation practices.	June 30, 2019

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

**Activity 1 Status as of July 1 2018:**

**Activity 1 Status as of January 1 2019:**

Activity 1 Status as of July 1 2019:

Activity 1 Status as of January 1 2020:

Activity 1 Status as of July 1 2020:

Final Report Summary:

**V. DISSEMINATION:**

Description:

Status as of January 1 2018:

Status as of July 1 2018:

Status as of January 1 2019:

Status as of July 1 2019:

Status as of January 1 2020:

Status as of July 1 2020:

Final Report Summary:

**VI. PROJECT BUDGET SUMMARY:**

**A. Preliminary ENRTF Budget Overview:**

**\*This section represents an overview of the preliminary budget at the start of the project. It will be reconciled with actual expenditures at the time of the final report.**

Budget Category	\$ Amount	Overview Explanation
Personnel:	\$ 340,000	2 precision specialists (70% salary 30% benefits), 100% FTE, over 3 years.
Professional/Technical/Service Contracts:	\$ 5,000	Contract work with, TBD (through bidding process), to produce an interactive statewide profitability map that uses data to predict past and present profitability by commodity price and soil type. This interactive map will be an online tool that is available to the public and will assist in promoting conservation on acres that may make sense to the farmer.
Equipment/Tools/Supplies:	\$ 3,000	2 computers: Necessary to perform daily duties along with working in numerous locations to provide planning to farmers. Needed because when traveling there will be no true "office".
Travel Expenses in MN:	\$ 45,730	Mileage, meals and hotel per commissioner's plan while traveling to meet with MN farmers to run analysis/precision planning.

Other:	\$ 3,270	Booth at MN Farmfest to promote, implement and amplify results of precision business planning. \$1,090 per year for 3 years
Other:	\$3,000	Implement workshops, field days and/or events to promote, implement and amplify results of precision business planning. 15 events @ \$200 each. Associated costs may include, but not limited to; postage, posters, printing materials (brochure, handouts, etc.) and event notifications (press, radio, etc.).
<b>TOTAL ENRTF BUDGET:</b>	<b>\$400,000</b>	

**Total Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 6 FTE**

**Total Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: .10 FTE**

**B. Other Funds:**

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
<b>Non-state</b>			
AgSolver	\$3,600 (cash)	\$	2 Wi-Fi Hot Spots at \$50 per month, per Specialist over 3 years = \$3,600
Landowner's	\$160,000 (cash)		50% contribution for subscription "program" use (\$1,000 per landowner) which generally costs \$2,000 per landowner
AgSolver	\$160,000 (in-kind)		50% in-kind contribution via reduced subscription contribution for "program" use.
Pheasants Forever	\$54,189 (in-kind)		Indirect on salary for 2 specialists (\$45,000 x .2007 x 2 specialist's x 3 years) for overhead costs.
Pheasants Forever	\$15,000 (Cash)		Chapter contribution (when project is in that particular County) towards cost share for working lands program.
<b>State</b>			
N/A	\$	\$	
<b>TOTAL OTHER FUNDS:</b>	<b>\$392,789</b>	<b>\$</b>	

**VII. PROJECT STRATEGY:**

**A. Project Partners:**

**Partners receiving ENRTF funding**

- TBD through bidding process, \$5,000, Create a statewide profitability map that is online, interactive and accesible to the public.

**Partners NOT receiving ENRTF funding**

- Through the use of the analysis program and precision planning process it may provide conservation program options and/or technical assistance from organizations such as, but not limited to; BWSR, SWCD's, DNR, NRCS, FSA and/or USFWS.

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

By showcasing the substantial benefits of working together with Minnesota farmers to implement voluntary conservation practices, we will achieve greater water quality, soil health, and wildlife (including pollinators) outcomes. By working side by side with both agriculture and conservation professionals it enables all parties to work together with a high level of collaboration providing sustainable opportunities to increase bottom lines, provide water quality benefits and wildlife benefits on acres that make sense for the farmer. By creating a working lands program it provides additional opportunities for farmers to implement beneficial practices on acres not previously considered for conservation. Working lands alternatives also provides opportunity to explore new and innovative crops, increase livestock production and the ability to diversify operations. The key question is whether we can shape this future by harnessing the technology to also include the economics of conservation practices at a sub-field planning scale. Once we demonstrate the value of using economics and environmental performance at a sub-field scale, we believe this technology and approach will be sustaining into the future.

**B. Funding History:**

Funding Source and Use of Funds	Funding Timeframe	\$ Amount
National Fish and Wildlife Foundation (NFWF) grant used to hire/employ precision specialist/s. These funds will expire on 6/30/17 and will be used to get employees up to speed allowing them to be fully prepared to utilize this opportunity from LCCMR and ENRTF funds to execute work at an efficient/accelerated speed.	FY16-FY17 Funds expire on 6/30/17	~\$66,000 from October 2016 through September 30 2017.

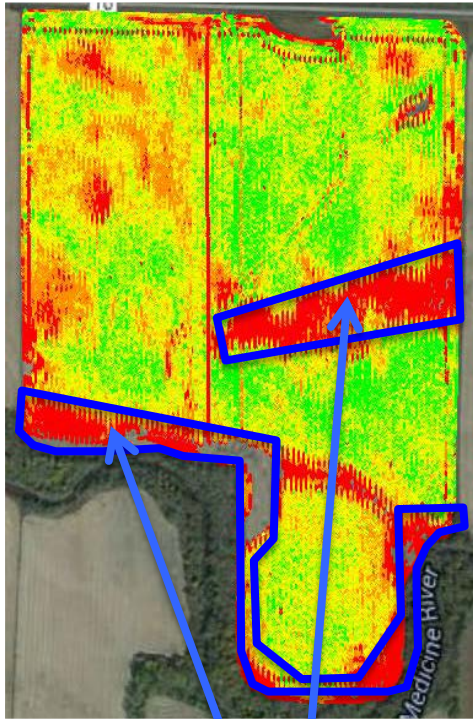
**VIII. REPORTING REQUIREMENTS:**

- **The project is for 3 years, will begin on 07/01/17, and end on 06/30/20.**
- **Periodic project status update reports will be submitted *January 1* and *July 1* of each year.**
- **A final report and associated products will be submitted between June 30 and August 15, 2020.**

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

See attached

# A WIN for Water, Wildlife and Farmers

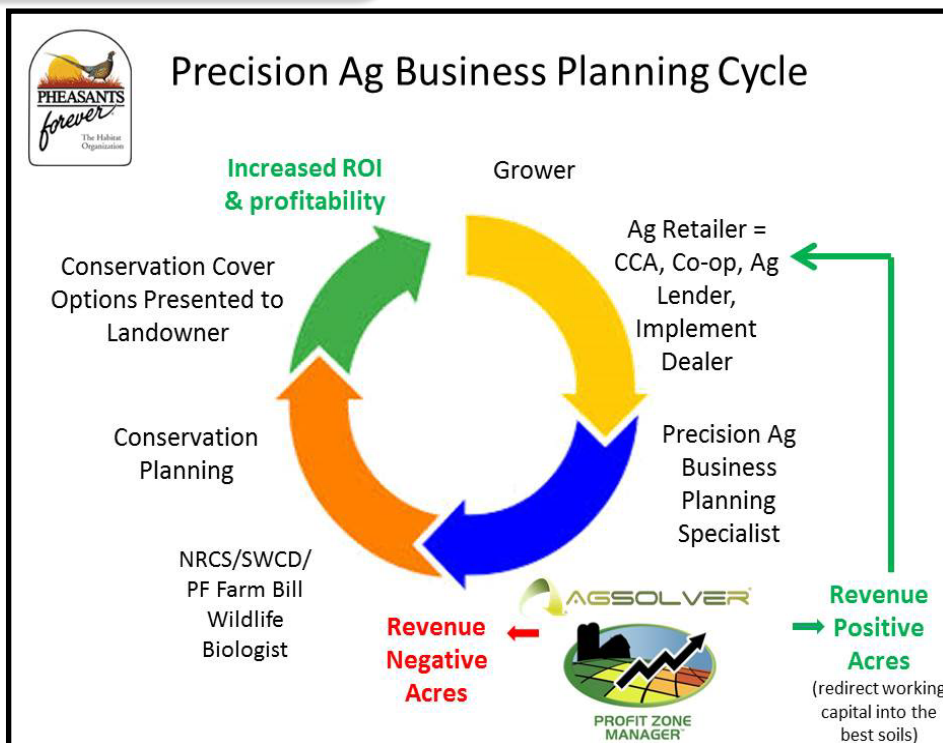
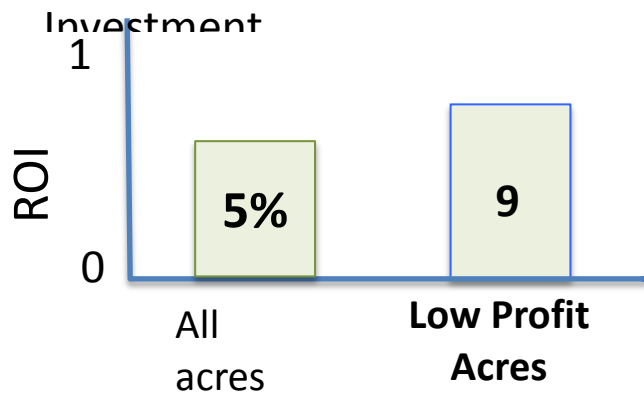


## LEGEND: Profit:

- + \$100 to
- + \$0 to
- \$0 to (-\$200)/acre

Revenue Negative Acres Identified for Conservation

## Whole Farm Return on Investment





**Environment and Natural Resources Trust Fund  
M.L. 2017 Project Budget**

**Project Title:** Economic Assessment of Precision Conservation and Agriculture

**Legal Citation:** M.L. 2017, Chp. 96, Sec. 2, Subd. 08j

**Project Manager:** Tanner Bruse

**Organization:** Pheasants Forever

**M.L. 2017 ENRTF Appropriation:** \$400,000

**Project Length and Completion Date :** 3 Years, June 30, 2020

**Date of Report:** Fill in the date of report submission (this will be updated for each status update report)

<b>ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET</b>	<b>Activity 1 Budget</b>	<b>Amount Spent</b>	<b>Activity 1 Balance</b>	<b>TOTAL BUDGET</b>	<b>TOTAL BALANCE</b>
<b>BUDGET ITEM</b>	<i>Precision Conservation and ROI: Sourcing New Acres for Conservation</i>				
<b>Personnel (Wages and Benefits)</b>					
<i>PF Precision Planning Specialist: \$170,000 (70% salary, 30%benefits): 100% FTE each year for 3 years</i>	\$170,000			\$170,000	\$170,000
<i>PF Precision Planning Specialist: \$170,000 (70% salary, 30%benefits): 100% FTE each year for 3 years</i>	\$170,000			\$170,000	\$170,000
<b>Professional/Technical/Service Contracts</b>					
<i>Contract work with, TBD (through bidding process), to produce an interactive statewide profitability map that uses data to predict past and present profitability by commodity price and soil type. This interactive map will be an online tool that is available to the public and will assist in promoting conservation on acres that may make sense to the farmer.</i>	\$5,000			\$5,000	\$5,000
<b>Equipment/Tools/Supplies</b>					
<i>Laptop. Necessary to perform daily duties along with working in numerous locations to provide planning to farmers. Needed because when traveling there will be no true "office".</i>	\$1,500			\$1,500	\$1,500

<i>Laptop. Necessary to perform daily duties along with working in numerous locations to provide planning to farmers. Needed because when traveling there will be no true "office".</i>	\$1,500			\$1,500	\$1,500
<b>Travel expenses in Minnesota</b>					
<i>Mileage. Travel to meet on site with farmers to run analysis/precision planning. Approximate mileage will be 10,000 miles per specialist, per year, at .54 per mile for 3 years</i>	\$32,400			\$32,400	\$32,400
<i>Lodging and Meals. While traveling to meet on site with farmers to run analysis/precision planning. Per commissioners plan lodging and meals will consist of approximately 15 nights lodging per specialist, per year, at \$100 per stay over 3 years (\$9,000) and approximately 70 meals per specialist, per year, over 3 years (\$4,330).</i>	\$13,330			\$13,330	\$13,330
<b>Other</b>					
<i>Booth at MN Farmfest to promote, implement and amplify results of precision business planning. \$1,090 per year for 3 years</i>	\$3,270			\$3,270	\$3,270
<i>Implement workshops, field days and/or events to promote, implement and amplify results of precision business planning. 15 events @ \$200 each. Associated costs may include, but not limited to; postage, posters, printing materials (brochure, handouts, etc.) and event notifications (press, radio, etc.).</i>	\$3,000			\$3,000	\$3,000
<b>COLUMN TOTAL</b>				<b>\$400,000</b>	<b>\$400,000</b>