



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

Date of Report: 29 May 2016
Date of Next Status Update Report: 30 November 2016
Date of Work Plan Approval: June 7, 2016
Project Completion Date: 30 June 2019
Does this submission include an amendment request? No

PROJECT TITLE: Prairie Butterfly Conservation, Research, and Breeding – Phase II

Activities 4 & 5 by DNR (Activities 1, 2 & 3 are being done by the Minnesota Zoo and are described in a separately submitted work plan - \$421,000)

Project Manager: Robert Dana, Ph.D.

Organization: Minnesota Department of Natural Resources

Mailing Address: 500 Lafayette Road, Box 25

City/State/Zip Code: St. Paul, Minnesota 55155

Telephone Number: (651) 259-5086

Email Address: robert.dana@state.mn.us

Web Address:

Location: Eleven counties in the prairie region of western Minnesota: Murray, Pipestone, Lincoln, Chippewa, Swift, Pope, Clay, Norman, Polk, Mahnomen, Kittson

Total ENRTF Project Budget:	ENRTF Appropriation:	\$329,000
	Amount Spent:	\$0
	Balance:	\$329,000

Legal Citation: M.L. 2016, Chp. 186, Sec. 2, Subd. 03c2

Appropriation Language:

\$750,000 the second year is from the trust fund. Of this amount, \$421,000 is to the Minnesota Zoological Garden and \$329,000 is to the commissioner of natural resources in collaboration with the United States Fish and Wildlife Service to continue efforts to prevent the extinction of imperiled native Minnesota butterfly species through breeding, research, field surveys, and potential reintroduction. This appropriation is available until June 30, 2019, by which time the project must be completed and final products delivered.

I. PROJECT TITLE: Prairie Butterfly Conservation, Research, and Breeding-Phase 2

II. PROJECT STATEMENT: Prairies and their native wildlife are an important part of Minnesota’s natural and cultural heritage. But with only 1% of that native prairie remaining, many prairie plant and animal species—including many species of once prevalent native butterflies—have dramatically declined. Ten of Minnesota’s prairie butterflies are of statewide conservation concern and two, the Poweshiek skipperling *Oarisma poweshiek* and Dakota skipper (*Hesperia dacotae*), are listed as Endangered and Threatened Species under the U.S. Endangered Species Act. Both have disappeared from the majority of their historic ranges (96+% for Poweshiek, 76+% for Dakota) in recent decades. Dakota skippers may only remain in one or two Minnesota locations. The Poweshiek skipperling was once one of the most abundant butterflies on Minnesota’s prairies, but has not been confirmed in Minnesota since 2008. It has also disappeared in North Dakota, South Dakota and Iowa between 2001 and 2008. Intensive surveys across the remaining isolated known populations in Michigan, Wisconsin, and Manitoba indicate that fewer than 500 Poweshiek skipperlings likely remain globally.

In partnership with the US Fish and Wildlife Service and the Minnesota Department of Natural Resources, the Minnesota Zoo’s Prairie Butterfly Conservation Program is establishing the world’s first and only conservation breeding populations for endangered, threatened, and imperiled Minnesota-native prairie butterflies. We utilize the recognized organizational capacity and experience of the Minnesota Zoo for the conservation of endangered species.

Currently largely supported by a M.L. 2014 ENRTF (M.L. 2014, Chp. 226, Sec. 2, Subd. 05j-1), this new ENTRF Project 009-A will provide the resources necessary to continue and expand the Minnesota Zoo’s Prairie Butterfly Conservation Program. Based on the recommendations from an independent working group, the Minnesota Zoo has been tasked with beginning the world’s first wild population supplementations and reintroductions of endangered Poweshiek skipperlings and Dakota skippers. It will also allow the Minnesota Zoo to continue to research on the risk to these endangered butterflies of potential exposure to widely applied agricultural pesticides.

The Minnesota Zoo is collaborating with the Minnesota Department of Natural Resources (DNR) for this joint ENTRF. Described in a separate Work Plan, the DNR will simultaneously monitor the status of these and a number of additional targeted butterfly species on native prairie remnants across Minnesota and will work to train new surveys to help alleviate a severe shortage of qualified observers. This joint work will provide needed information of status of not only Minnesota’s native prairie butterflies, but also the greater prairie ecosystem, and steps that may be needed to further their conservation. Beyond serving as pollinators for various prairie plants and as food sources for other prairie wildlife, butterflies are sensitive “canary in the coalmine” indicators of prairie ecosystem health. The disappearance of these historically widespread Minnesota prairie butterflies is noteworthy and troubling.

III. OVERALL PROJECT STATUS UPDATES:

Project Status as of Nov. 30, 2016:

Project Status as of May 31, 2017:

Project Status as of Nov. 30, 2017:

Project Status as of May 31, 2018:

Project Status as of Nov. 30, 2018:

Project Status as of May 31, 2019:

Overall Project Outcomes and Results: Aug. 15, 2019

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Breeding and potential reintroduction of endangered butterflies (See separate work plan by MN Zoo)

ACTIVITY 2: Pesticides Research – Phase 2 (See separate work plan by MN Zoo)

ACTIVITY 3: Butterfly Survey and Status Monitoring (MN DNR)

Description:

The DNR will continue its critical survey efforts to locate wild populations of prairie butterflies implemented under the ENRTF in 2014, especially those that are federally- and state-listed. The number of sites will be reduced to 16, with more repeat surveys during the flight periods and more extensive surveys in the larger sites. These sites comprise a total of about 7500 acres in seven western MN counties, from Pipestone to Kittson. DNR will also initiate quantitative (abundance) monitoring of the two federally-listed species in at least one and up to five of these sites (depending on results of the survey), with a focus on the response of the butterflies to prairie management, and will monitor any sites where captive-reared insects are released.

Summary Budget Information for Activity 3:

ENRTF Budget: \$320,571
Amount Spent: \$0
Balance: \$320,571

Outcome	Completion Date
1. Extensive survey of prairie sites completed, and current status of MN’s prairie-dependent butterflies, especially the federally listed ones, determined	Sept 15, 2017
2. Two to three years of quantitative data collected in at least two sites on response of the federally and state listed species to prairie management	June 30, 2019
3. Quantitative monitoring initiated for any reintroduction effort	June 30, 2019

Activity Status as of Nov. 30, 2016:

Activity Status as of May 31, 2017:

Activity Status as of Nov. 30, 2017:

Activity Status as of May 31, 2018:

Activity Status as of Nov. 30, 2018:

Activity Status as of May 31, 2019:

Final Report Summary Aug. 15, 2019:

ACTIVITY 4: DNR Butterfly identification and survey training (MN DNR)

Description: The DNR will conduct training workshops in identification and survey techniques to increase the number of qualified surveyors that can identify these butterflies, a critical need for a sustained long-term conservation effort. The target will be wildlife and other natural resource professionals. Special effort will be made to train field workers for the ENRTF-funded project M.L. 2015 03o, Effects of grazing vs. fire for prairie

management, as they will be working in ca. 75 prairie sites in the state. Butterflies are one of the taxa being targeted for study, but the field workers will need special training to reliably identify most of the target species of this project.

Summary Budget Information for Activity 4:

ENRTF Budget: \$8,429
Amount Spent: \$0
Balance: \$8,429

Outcome	Completion Date
1. Two training workshops in prairie butterfly identification and survey completed, with at least 5 individuals successfully trained and able to contribute to survey work. At least as many able to perform a sentinel function.	June 30, 2019

Activity Status as of Nov. 30, 2016:

Activity Status as of May 31, 2017:

Activity Status as of Nov. 30, 2017:

Activity Status as of May 31, 2018:

Activity Status as of Nov. 30, 2018:

Activity Status as of May 31, 2019:

Final Report Summary Aug. 15, 2019:

V. DISSEMINATION:

Description: The presence of either of the Federally listed species (Poweshiek skipperling, Dakota skipper) will be communicated promptly to the MN Zoo, USFWS, and the owners/managers of sites where observed. All survey and monitoring results will be entered into the DNR Natural Heritage Information System. A major use of this database is environmental review. If USFWS initiates status review of any of the other species, the data for these will be made available. For the state-listed species, the species pages in the DNR website will be updated to reflect new information. Beyond the term of this project, the quantitative monitoring of selected sites will be analyzed for evidence of trends and for effects of particular management activities. These data may trigger more intensive research to determine causality.

Status as of Nov. 30, 2016:

Status as of May 31, 2017:

Status as of Nov. 30, 2017:

Status as of May 31, 2018:

Status as of Nov. 30, 2018:

Status as of May 31, 2019:

Final Report Summary Aug. 15, 2019:

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget Overview:

Budget Category	\$ Amount	Overview Explanation
Personnel:	\$ 159,100	DNR entomologist/project coordinator (1 clsfd @ 35% time, salary & benefits, 3 yrs); DNR asst entomologist (1 unclsfd @ 25% time, salary & benefits, 3 yrs; DNR data mgmt specialist (1 unclsfd @ 10% time, salary & benefits, 3 yrs; 1 graphics/Web design specialist (1 clsfd @ 10% time, salary & benefits, 1 yr)
Professional/Technical/Service Contracts:	\$ 126,000	Survey & monitoring contracts (experienced butterfly surveyors)
Equipment/Tools/Supplies:	\$ 3,156	Data measurement & collection, specimen curation supplies
Capital Expenditures over \$5,000:	\$	
Fee Title Acquisition:	\$	
Easement Acquisition:	\$	
Professional Services for Acquisition:	\$	
Printing:	\$	
Travel Expenses in MN:	\$ 24,000	Travel to sites, meals, lodging during field work
Other:	\$ 16,744	DNR Direct and Necessary*
TOTAL ENRTF BUDGET:	\$ 329,000	

*Direct and Necessary expenses include both Department Support Services (Human Resources, IT Support, Safety, Financial Support, Communications Support, Planning Support, and Procurement Support) and Division Support Services. Department Support Services are described in the agency Service Level Agreement, and is billed internally to divisions based on rates that have been developed for each area of service. These services are directly related to and necessary for the appropriation. Department leadership services (Commissioner’s Office and Regional Directors) are not assessed. Division Support Services include costs associated with Division business offices and clerical support. Those elements of individual projects that put little or no demand on support services such as large single-source contracts, large land acquisitions, and funds that are passed-thru to other entities are not assessed Direct and Necessary costs for those activities.

Explanation of Use of Classified Staff:

The project lead for butterfly monitoring is the Entomologist/Prairie Ecologist for the Minnesota Biological Survey (MBS). Survey work by MBS is currently focused on documenting the butterfly and moth fauna in unsurveyed areas of the state and will be conducted by a seasonal employee. This project is a natural complement to the Survey’s normal work. The amount of work for the other classified position, Data Management Specialist, is small—218 hours over three years, or 3% of that position’s time—and is expected to have minimal impact on the normal work of that position.

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

N/A

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

2.2

Number of Full-time Equivalentents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation:

0.8

B. Other Funds:

No other funds will be used for this part of the project.

VII. PROJECT STRATEGY:**A. Project Partners:**

Minnesota Zoo

B. Project Impact and Long-term Strategy:

Two years of extensive mid- and late-summer surveys and one year of late-spring/early-summer surveys carried out by DNR under the current ENRTF grant (M.L. 2014 05j2) have confirmed that Minnesota's prairie-dependent butterflies are in serious trouble. Only one species, the Regal fritillary, appears to be holding its own. Most seriously, the federally endangered Poweshiek skipperling was not detected in any of the surveyed sites, lending further support to the conclusion that it is no longer extant in the state, formerly home to a major proportion of its global population. However, our surveys of the large sites in the far northwest corner of the state, which are only a few miles distant from the southern Manitoba population, the only one known to be extant in the tallgrass prairie region, have not been as extensive or intensive as desired. Further, inspection of new, very high-resolution aerial photography of this area has identified two potential sites that have never been surveyed.

Almost as troubling as the failure to find Poweshiek, the federally threatened Dakota skipper was observed in only one site (same one both years). However, this past summer one individual was photographed in another site by independent observers, in a part of the site not sampled by our transects. This vividly illustrates the difficulty of "proving" absence. Clearly, more extensive survey in this large site is warranted. For similar reasons several other large sites may support butterflies despite our failure so far to detect them. Our failure to find the main target of the early summer survey effort this past season, the first year we could survey during that period, supplemented by failure of an independent survey the previous year to find it in a subset of our sites, indicates that this species may have become as elusive as the previous two, requiring more than two years of effort to clarify its status.

Compounding the intrinsic difficulty in detecting very rare butterflies, variability in weather from year to

year. Insect populations in general fluctuate from year to year, often quite dramatically, in response to weather, disease, predation, and other factors. Numbers can be driven too low to detect without extraordinary effort or luck by several years of unfavorable conditions and then quickly rebound with a year or two of favorable conditions. Additionally, accomplishing survey work during the short part of the flight period when numbers are at their peak and when weather conditions are conducive to activity that makes their presence readily detectable is challenging. Hence, a series of several years if really needed for confident determination of status.

The extension of survey effort accomplished with this project will greatly help resolve uncertainties about the status of Minnesota's prairie-dependent butterflies. In doing so, it may provide important clues regarding the cause(s) of their decline. Management of sites where they are found to be present will be modified to minimize risks and perhaps to enhance the quality of the habitat for the butterflies. Confirmation of presence will also trigger legal safeguards for those species that are federally or state listed. Discovery of extant colonies of Poweshiek in Minnesota will enable the Zoo to include Minnesota genotypes in captive rearing for reintroductions in the state. Monitoring of releases will determine whether they are successful, a critical component of this conservation strategy. Monitoring of these releases and of extant populations will contribute to the understanding of the factors that are major drivers in their population dynamics.

Monitoring is a long-term commitment, and this project will continue what has been initiated in the current project as well as possibly expand with additional sites. We intend this project to refine monitoring protocols developed in the current project for long-term employment. We will continue to work on strategies for funding the long-term work.

The observation this summer of a Dakota skipper in a survey site by independently active “citizen-scientists” underscores the value of individuals who are in places where these butterflies are possible having the ability to recognize them. The identification workshops will increase the supply of such people, magnifying our capacity to survey (and possibly monitor) these insects. We intend to continue holding such workshops on an annual or biennial basis beyond the life of this grant, as trained persons leave and new, untrained ones arrive.

C. Funding History:

Funding Source and Use of Funds	Funding Timeframe	\$ Amount
ENRTF (M.L. 2014 Chp. 226 Sec. 2 Subd. 05j-2): Appropriation of cash funds to support the MN DNR part of the project Imperiled Prairie Butterfly Conservation, Research, and Breeding Program, led by MN Zoo. This (Activity 3) consisted of surveys and initial monitoring of 11 prairie-dependent butterfly species.	FY14-FY16	\$245,000
		\$
		\$

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

No acquisitions or restoration work is included in this part of the project.

IX. VISUAL COMPONENT or MAP(S):

See attached Map of survey sites superimposed on Prairie Plan map.

X. RESEARCH ADDENDUM:

N/A, per communication with LCCMR staff (continuation of project already vetted by peer review)

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted no later than Nov. 30, 2016, May 31, 2017, Nov. 30, 2017, May 31, 2018, Nov. 30, 2018, and May 31, 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: Prairie Butterfly Conservation, Research, and Breeding – Phase II

Legal Citation: M.L. 2016, Chp. 186, Sec. 2, Subd. 03c2

Project Manager: Robert Dana, Ph.D.

Organization: Minnesota Department of Natural Resources

M.L. 2016 ENRTF Appropriation: \$ 239,000

Project Length and Completion Date: 3 years, June 30, 2019

Date of Report: May 29, 2016

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 3 Budget	Amount Spent	Activity 3 Balance	Activity 4 Budget	Amount Spent	Activity 4 Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	Butterfly Survey and Status		Butterfly identification and survey					
Personnel (Wages and Benefits)	\$151,100		\$151,100	\$8,000		\$8,000	\$159,100	\$159,100
Project coordinator/Lead entomologist. \$98,170 (70% salary, 30% benefits); .35 FTE for 3 yrs								
Entomologist \$35,210 (70% salary, 30% benefits); 0.25 FTE for 3 yrs								
Data management specialist \$17,000 (70% salary, 30% benefits); 0.1 FTE for 3 yrs								
Graphics/Web design Specialist \$8,720 (50% salary, 50% benefits) 0.1 FTE for 1 yr								
Professional/Technical/Service Contracts	\$126,000		\$126,000				\$126,000	\$126,000
TBD (competitive bid); site surveys to detect presence of target butterfly species and quantitative monitoring in selected sites; 3 yrs								
Equipment/Tools/Supplies	\$3,156		\$3,156				\$3,156	\$3,156
field measuring/recording devices etc. (GPS), close-focusing binoculars, cameras, and entomological collecting and specimen curation tools								
Travel expenses in Minnesota	\$24,000		\$24,000				\$24,000	\$24,000
field work in-state travel and associated expenses								
Other	\$16,315		\$16,315	\$429		\$429	\$16,744	\$16,744
DNR direct and necessary expenses** HR support (~\$3,201), Safety support (~\$755), Financial support (~\$4,371), Communication support (~\$1,236), IT support (~\$6,147), Planning support (~\$829), and Procurement support (~\$235) necessary to accomplishing funded								
COLUMN TOTAL	\$320,571	\$0	\$320,571	\$8,429	\$0	\$8,429	\$329,000	\$329,000

M.L. 2016 ENRTF 009-A Prairie Butterfly Conservation, Research, and Breeding - Phase 2:
DNR Survey and Monitoring Sites



