

M.L. 2014, Chp. 226, Sec. 2, Subd. 05n Project Abstract

For the Period Ending June 30, 2017

PROJECT TITLE: Expansion of Minnesota Wildflowers Online Botanical Reference

PROJECT MANAGER: Catherine Chayka

AFFILIATION: Minnesota Wildflowers Information

MAILING ADDRESS: 1590 Long Lake Rd

CITY/STATE/ZIP: New Brighton, MN 55112

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E-MAIL: info@minnesotawildflowers.info

WEBSITE: <https://www.minnesotawildflowers.info>

FUNDING SOURCE: Environment and Natural Resources Trust Fund

LEGAL CITATION: M.L. 2014, Chp. 226, Sec. 2, Subd. 05n

APPROPRIATION AMOUNT: \$150,000

AMOUNT SPENT: \$150,000

AMOUNT REMAINING: \$0

Overall Project Outcomes and Results

Minnesota Wildflowers, an online field guide to the plants of Minnesota, was launched in 2007 by an amateur botanist who grew frustrated with the lack of information and quality imagery specific to Minnesota's flora. The task of systematically seeking out specific plants, photographing the identifying characteristics, describing each species in non-technical terms, and publishing on the web was undertaken with the goal of becoming a comprehensive reference for all of Minnesota's 2100+ plants.

The need for such a reference, especially targeted to non-botanists, has been evident by the number and type of users of the website, virtually anyone asking such questions as: *What is that plant? Is it native or a weed? How to distinguish it from similar plants?* These users include natural resource managers, restoration specialists, educators from elementary school through university level, citizen scientists, native plant advocates, gardeners and the general public. In 2014 when ENRTF funding began, 799 species (mostly forbs) had been published and the average traffic during peak season was 2,000 visits and 10,000 web pages viewed per day.

During the 3-year funding period, the 2-member team traveled 35,000 miles visiting locations in 64 Minnesota counties, photographed 1200 plant species, 500 of which had not previously been photographed. This field work resulted in significantly increased coverage. As of June 30, 2017, 1337 species have been published (over 60% of all Minnesota plant species) including trees/shrubs, grass-like plants and ferns. More than 220 species profiles were updated with improved images and information. Traffic has more than doubled with over 5,000 visits and nearly 23,000 pages viewed per day during 2017 peak season. 468,000 unique users were served in 2016 and numbers continue rising. This clearly shows the website is a valued resource and the more species covered, the more valuable it becomes.

Project Results Use and Dissemination

While word-of-mouth and Google searches are the source of much traffic, our web statistics show the single highest usage comes from the State of Minnesota, which includes multiple state agencies as well as the University of Minnesota. Our plant images are in high demand for other educational and outreach purposes, including interpretive signs, PowerPoint presentations, and invasive species fact sheets. Our field work puts us in contact with many state parks, nature centers and educational institutions across the state where we promote the project to their staff and visitors. During the past 3 years we partnered with the DNR State Parks and Trails on their wildflower geocaching program, were profiled in the Minnesota Conservation Volunteer magazine, and gave presentations about the project to the Minnesota Native Plant Society, the Minnesota Wetlands Professionals Association, the

Minnesota Landscape Arboretum, Master Naturalists, Master Gardeners, Wild Ones and several garden clubs.



Environment and Natural Resources Trust Fund (ENRTF)

M.L. 2014 Work Plan

Date of Report: July 17, 2017

Date of Next Status Update Report: Final Report

Date of Work Plan Approval: June 4, 2014

Project Completion Date: 06/30/2017

Does this submission include an amendment request? NO

PROJECT TITLE: Expansion of Minnesota Wildflowers Online Botanical Reference

Project Manager: Catherine Chayka

Organization: Minnesota Wildflowers Information

Mailing Address: 1590 Long Lake Road

City/State/Zip Code: New Brighton, MN 55112

Telephone Number: (651) 399-4064

Email Address: info@minnesotawildflowers.info

Web Address: <https://www.minnesotawildflowers.info/>

Location:

Plant Survey & Photography: Selected sites statewide

Website publishing: In-house at New Brighton address

Total ENRTF Project Budget:

ENRTF Appropriation: \$150,000

Amount Spent: \$150,000

Balance: 0

Legal Citation: M.L. 2014, Chp. 226, Sec. 2, Subd. 05n

Appropriation Language:

\$150,000 the second year is from the trust fund to the commissioner of natural resources for an agreement with Minnesota Wildflowers Information in cooperation with the University of Minnesota Bell Museum of Natural History to accelerate field work for surveying and imaging of plant species and publication of species profiles to a plant identification reference website available to the public and land managers. Images acquired and information compiled using these funds are for purposes of public information available on a website. If the organization is no longer able to maintain the website it shall work with the state and the University of Minnesota Bell Museum of Natural History to ensure the materials remain publicly available on the web. This appropriation is available until June 30, 2017, by which time the project must be completed and final products delivered.

I. PROJECT TITLE: Expansion of the Minnesota Wildflowers Online Botanical Reference

II. PROJECT STATEMENT:

Apart from a handful of professionals, the average Minnesotan and even most professional natural resource managers are not skilled in plant identification, yet the ability to positively identify plants is crucial in identifying areas that need protection, in recognizing new or existing invasive species, in monitoring restoration projects, in delineating wetlands, in managing invasive species. The Minnesota Wildflowers project fills this need by providing a free, web-based field guide that currently profiles over 750 plant species with more than 5500 high quality photos. This 3-year funding commitment will allow the project to more than double the rate new species are published, expand the image catalog by a target 500-700 additional species, and bring it approximately 2/3 the way to profiling all 2100+ vascular plant species in Minnesota, as recognized by the Minnesota Department of Natural Resources.

Quality control is paramount to producing a quality reference. We use only credible botanical sources as well as our extensive personal experience in drafting species accounts. The richness of the resource comes from the high quality technical images associated with each species. Experience has taught us that the only way to reliably obtain the quality images required for identification purposes is to photograph the plants ourselves (donated images rarely meet quality standards, are inadequate to supply a complete suite for a species account, or simply do not exist for many Minnesota plant species). Gathering technical images requires extensive field work throughout the state during the growing season, and intensive publishing through the winter months.

III. PROJECT STATUS UPDATES:

Project Status as of: January 18, 2015

In July, 2014, the USDA online plants database (plants.usda.gov) implemented a new county distribution mapping system. The old USDA distribution maps were utilized by approximately 160 species published on the MWI website and this resulted in those species no longer having any county distribution maps. The decision was made to give priority to updating these 160 species with new maps created by MWI staff, which meant a temporary slow-down in publishing new species until those updates were complete. This also provided an opportunity to update those older species accounts with improved images and information. As of December 31, 100 of these species have been updated, with 885 total species published to-date.

Project Status as of: November 22, 2015

All but four of the 160 species noted above requiring new distribution maps were updated by the end of April, with 1025 total species published as of October 31.

In late January we purchased a high-quality macrophotography system which enables us to produce clear, high-resolution images of the flowering and fruiting structures of graminoids (grasses, sedges and rushes), and eventually the aquatics, through a process called photo stacking. We felt this was necessary to provide quality species accounts for these plant groups. While the system gives the intended results, it is a time-consuming process and must be done in a lab setting during the field season when fresh plant material is available. This has resulted in a slow-down in publishing new species during the field season but provides the necessary images for future publishing. It has also resulted in many more hours logged in field and publishing prep time. For each week in the field, 2 to 5 additional days can be spent on this macrophotography process, which is time not spent on publishing or other field work. The loss this year of a part-time, seasonal field photographer has put added pressure on Peter Dziuk, currently the only full-time seasonal field photographer. We expect another part-time field photographer will join the project next field season and ease the work load for Dziuk.

Amendment Request (November 22, 2015):

Two unexpected added tasks have caused delays in publishing new species:

As noted in the first status update, approximately 160 previously published species accounts were affected when the USDA Plants website implemented new distribution maps. For quality reasons, we deemed it necessary to escalate updating these older species accounts with new maps (which we create ourselves), and also took the opportunity to update related images and information where warranted. This caused a temporary slow-down in adding new species. These 160 updates have since been completed.

As noted in the second status update, we purchased a high quality macrophotography system for the purpose of photographing the tiny flowering and fruiting structures of graminoids, which are necessary to produce high quality species accounts for this plant group. While the system gives the expected results, it is a time-consuming process with a limited window for completion, during the field season while fresh plant material is available. Time spent on this process is time not spent on publishing or other field work.

Consequently, these publishing delays and slow-downs mean the target number of 600-700 new species will not be met by the end of the 3-year project. The new target is 500 species.

Amendment Approved: December 11, 2015

Project Status as of: April 12, 2016

Publishing is progressing on schedule with no unexpected slow downs or delays. As of March 31, 1127 total species have been published on the website. Little travel is done over the winter months except to obtain a limited number of images for dormant trees and shrubs.

Project Status as of: November 14, 2016

The project is on track to meet all objectives. As of October 31, 1245 total species have been published on the website. During the 2016 field season, 12,700 miles were traveled within Minnesota and approximately 375 species photographed in preparation for future publishing.

Project Status as of: April 14, 2017

Publishing targets have already been met. As of April 1, 527 species have been added with 1319 total species published on the website. Publishing will continue while funds remain, part of which will include developing a plant search facility specific to grasses. Planning for the 2017 field season is in progress.

Amendment Request (June 4, 2017):

Since Activity #2 publishing goals have already been met and personnel needs for the last month of funding would be over and above our commitment, we request most of the remaining funds designated for personnel and equipment/supplies (total amount \$949) move to Activity #1 travel. June is one of the most important months in our field season and these funds would be best utilized covering necessary travel expenses.

Activity #1: \$390 personnel and \$2 equipment/supplies moved to Activity #1 travel.

Activity #2: \$511 personnel and \$46 equipment/supplies moved to Activity #1 travel.

This will deplete all personnel funds, leave \$64 in Activity #2 equipment/supplies, and increase travel funds for the final month from \$1109 to \$2058.

Amendment Approved: [06/04/17]

Overall Project Outcomes and Results:

Minnesota Wildflowers, an online field guide to the plants of Minnesota, was launched in 2007 by an amateur botanist who grew frustrated with the lack of information and quality imagery specific to Minnesota's flora. The task of systematically seeking out specific plants, photographing the identifying characteristics, describing each species in non-technical terms, and publishing on the web was undertaken with the goal of becoming a comprehensive reference for all of Minnesota's 2100+ plants. The need for such a reference, especially targeted to non-botanists, has been evident by the number and type of users of the website, virtually anyone asking such questions as: *What is that plant? Is it native or a weed? How to distinguish it from similar plants?* These users include natural resource managers, restoration specialists, educators from elementary school through university

level, citizen scientists, native plant advocates, gardeners and the general public. In 2014 when ENRTF funding began, 799 species (mostly forbs) had been published and the average traffic during peak season was 2,000 visits and 10,000 web pages viewed per day. During the 3-year funding period, the 2-member team traveled 35,000 miles visiting locations in 64 Minnesota counties, photographed 1200 plant species, 500 of which had not previously been photographed. This field work resulted in significantly increased coverage. As of June 30, 2017, 1337 species have been published (over 60% of all Minnesota plant species) including trees/shrubs, grass-like plants and ferns. More than 220 species profiles were updated with improved images and information. Traffic has more than doubled with over 5,000 visits and nearly 23,000 pages viewed per day during 2017 peak season. 468,000 unique users were served in 2016 and numbers continue rising. This clearly shows the website is a valued resource and the more species covered, the more valuable it becomes.

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Field Survey and Digital Photography

Description:

Precise, high resolution digital images of all key plant morphological characteristics that are necessary for accurate identification will be collected from locations across the state. Over 99% of images used in the Minnesota Wildflower identification resource are obtained directly in the field by staff through survey, using historical records available from the Herbarium at the Bell Museum of Natural History as a primary source of location information for specific species. Survey sites are selected based on age, habitat quality and site accessibility. While increasing time and mileage, routes such as freeways are avoided, rather state trunk, county highways and rural back roads are utilized allowing for slower speeds, closer proximity to remnant habitats and facilitating frequent stops to explore areas such as road ditches, gravel pits, railroad rights-of-way, and public boat accesses en route to planned survey destinations. Every attempt is made to capture high resolution digital images of all relevant morphological details in a natural setting using natural light and without destroying the target specimen. When appropriate and permitted, specimens may be collected for further study and photography in vitro. If species are located but not suitable for photography, for reasons such as poor weather or phenology, their locations are documented using GPS for return trips later that season or in subsequent seasons. Most images are reviewed post field season for quality and/or redundancy.

Summary Budget Information for Activity 1:

ENRTF Budget: \$ 42,065
Amount Spent: \$ 42,065
Balance: \$ 0

Activity Completion Date: June 30, 2017

Outcome	Completion Date	Budget
1. 39,000 miles traveled statewide, 40-60 sites visited/yr, complete image sets obtained for 450-750 plant species - both native and exotic, including forbs, trees, shrubs, ferns, grasses, sedges, rushes	June 30, 2017	\$42,065

Activity Status as of: January 18, 2015

For the period of July 1-December 31, 10,270 miles were traveled across the state, visiting destinations in 45 Minnesota counties. Images were obtained for over 175 plant species, though not all are complete sets. Some of the more than 12,000 images captured completed or improved upon species sets obtained in prior years.

Activity Status as of: November 22, 2015

For the period of January 1-October 31, 16,302 miles were traveled across the state, visiting destinations in 35 Minnesota counties (26,572 total miles to-date for the project). Over 20,000 images were captured covering 420 plant species, approximately 200 of which are graminoids, though complete sets were not obtained for all of these species. Approximately 25% were improvements or expansions upon previously published species.

Activity Status as of: April 12, 2016

For the period of November 1-March 31, fewer than 100 miles were traveled, primarily to obtain late season fruits, dormant buds, and early spring flowers for approximately 20 tree and shrub species.

Activity Status as of: November 14, 2016

For the period of April 1-October 31, 12,692 miles were traveled across the state, visiting destinations in 49 Minnesota counties. Nearly 16,000 images were captured covering 375 plant species, 165 of which are graminoids, though complete sets were not obtained for all of these species. Approximately 20% were improvements or expansions upon previously published species.

Activity Status as of: April 14, 2017

For the period of November 1-April 1, fewer than 100 miles were traveled, primarily to obtain a late season flowering shrub.

Final Report Summary:

For the period of April 1 to June 30, 4532 miles were traveled, visiting all four corners of the state and photographing over 110 plant species. Over 3 years, the 2-member team has traveled more than 35,000 miles to locations in 64 of Minnesota's 87 counties and photographed 1200 species, 500 of which had not been previously photographed by the team. Over 60,000 images were added to the image catalog. The vast majority of field work was done solo, by Peter Dziuk. The work can be physically challenging, not only when hiking over rough terrain, but from the endless hours of driving to reach distant destinations. Future field work should be done by a team of at least 2 people. This not only takes away some of the monotony of driving, but also puts a second pair of eyes on survey tasks, which can lead to even more successful outings.

ACTIVITY 2: Publishing Plant Identification Pages to the Field Guide

Description:

Species identification accounts are drafted addressing all key morphological structures (i.e. flowers, leaves, stems, etc.). Field notes are cross-referenced with standard accepted botanical references (e.g. Gleason & Cronquist, Flora of North America, Britton & Brown, Smith, Mohlenbrock, Hitchcock, etc.). Any inconsistencies or conflicting information between various references and field observations are resolved prior to publication. County distribution maps are constructed using confirmed personal observations and Herbarium records (Bell, Lakela) for point locations, along with the DNR's MNTaxa county level information. Technical terms are rephrased as needed to ensure understanding by users of all experience levels. Cross references are made to related and/or similar species, and a previously published species may be updated to include new information, additional or improved images, and/or a reciprocal link to the new species account. Cataloged field images are again reviewed for completeness, selected and edited as required to clearly show the desired traits, then optimized for web use and uploaded to the remote web site. The final text draft is typically reviewed by a collaborator before publishing and any errors, omissions or ambiguities corrected.

Taxonomy and the statewide vascular plant spreadsheet published by the Minnesota Department of Natural Resources (i.e. MNTaxa) are reviewed annually. Previously published species accounts are updated when appropriate.

Summary Budget Information for Activity 2:

ENRTF Budget: \$ 107,935
Amount Spent: \$ 107,935
Balance: \$ 0

Activity Completion Date: June 30, 2017

Outcome	Completion Date	Budget
1. 500 new plant species pages added to field guide, at least 50% non-forbs (trees, shrubs, ferns, grasses, sedges, rushes)	June 30, 2017	\$ 107,935

Activity Status as of: January 18, 2015

For the period July 1-December 31, 92 species were added to the website: 42 forbs (46%), 31 trees/shrubs, 10 ferns/fern allies, 9 grasses. In addition, 122 previously published species were updated with improved images, information, and new county distribution maps. An updated MNTaxa plant list was downloaded in early January and preparations made for associated species revisions, primarily updating county distribution information for 18 species.

Activity Status as of: November 22, 2015

232 species have been added to the website and 209 updated since the project began in July, 2014. For the period of January 1 - October 31, 140 species were added: 59 forbs (42%), 39 trees/shrubs, 36 sedges, 6 ferns. In addition, 87 species were updated with improved images, information and new or updated county distribution maps. A new search facility specific to *Carex* species was developed to aid visitors attempting to identify sedges.

Activity Status as of: April 12, 2016

335 species have been added to the website and 213 updated since the project began in July, 2014. For the period of November 1 - March 31, 103 species were added: 38 forbs (37%), 42 trees/shrubs, 20 grasses/sedges, 3 ferns; 4 other species were updated. An updated MNTaxa plant list was downloaded in early January and county distributions updated for 56 previously published species; a total of 211 species had new distribution maps created. 28 species were added to the plant list but no county-level information is yet available from MNTaxa.

Activity Status as of: November 14, 2016

452 species have been added to the website and 225 updated since the project began in July, 2014. For the period of April 1 - October 31, 118 species were added: 41 forbs (35%), 14 trees/shrubs, 61 grasses/sedges, 2 ferns. In addition, 12 species were updated with improved images and/or information, and new or updated county distribution maps created for 42 species.

Activity Status as of: April 14, 2017

527 species have been added to the website and 249 updates made since the project began in July, 2014. For the period of November 1 - April 1, 74 species were added: 20 forbs (27%), 13 trees/shrubs, 33 grasses/sedges, 8 ferns; 24 other species were updated and new distribution maps created for 63 species. An updated MNTaxa plant list was downloaded in early January and county distribution data updated for 86 previously published species, though new distribution maps for all 86 are not yet complete. A number of algae species were added to the MNTaxa plant list but we will not be profiling these.

Final Report Summary:

For the period of April 1 to June 30, 17 species were added to the website; 544 total species have been added since funding began: 207 forbs (38%), 163 grass-like plants, 141 trees and shrubs, 33 ferns. Over 220 species have been updated with improved images and information, and hundreds of new distribution maps created. Total number of species published is 1337, representing over 60% of Minnesota's flora. The images in the existing catalog are sufficient to add at least an additional 200 species, while the remaining species have either incomplete image sets or have not yet been obtained.

V. DISSEMINATION:

Description:

Individual species additions and updates are announced on the web site's home page (<http://www.minnesotawildflowers.info>) as they are made, and announcements of important project updates and discoveries are made to social networking sites and/or the web site's blog. A statewide email mailing list is being compiled of nature centers, environmental organizations, educators and natural resource agencies to

notify those groups of the expanded project and how they may utilize this resource in their own programs. We seek additional public outreach opportunities at relevant expositions and conferences, as well as presentations to garden clubs and other groups interested in the wild plants of Minnesota.

Activity Status as of: January 18, 2015

In early July, an announcement regarding the ENRTF funding was made on the website's blog and on social media, and the ENRTF logo with recommended citation added to the website footer. Discussions are now taking place regarding tentative collaborations with multiple MN DNR departments.

Activity Status as of: November 22, 2015

Public outreach activities since January have included 5 presentations, including the Keynote speaker presentation to the Winona Master Gardeners, and presentations to the Minnesota Wetland Professionals Association and at the MN Landscape Arboretum. A partnership was also formed with MN DNR State Parks and Trails in their wildflower geocaching program, which provides additional exposure to the Minnesota Wildflowers project. Contacts have been made at a number of State Parks visited during the field season. The email list of statewide contacts continues to grow.

Activity Status as of: April 12, 2016

Public outreach activities included a presentation for the Minnesota Native Plant Society and a table at the annual Wild Ones convention. An article about the website was published in the March-April edition of Minnesota Conservation Volunteer magazine. Website traffic continues to grow, reaching 358,000 unique users viewing over 2.6 million web pages in all of 2015, with the first three months of 2016 showing a 20% increase in users and 40% increase in page views over the same period in 2015, which also indicates a rise in individual users using the website more than before.

Activity Status as of: November 14, 2016

No specific public outreach activities were performed during the field season but arrangements have been made for multiple events over the coming winter months. During field season travels we continue to promote the project to staff at State Parks and nature centers, and to other visitors encountered in parks and natural areas. The overwhelming response is "I use your website all the time". As of October 31, 420,000 unique users have visited the website in 2016, viewing over 3.2 million web pages.

Activity Status as of: April 14, 2017

Public outreach activities included presentations to Master Gardeners and Wild Ones, and manning tables at the Minnesota Wetland Professionals annual conference and Minnesota Native Plant Society annual symposium. For the first 3 months of 2017, website traffic is up more than 50% over the same period in 2016.

Final Report Summary:

No specific public outreach activities were performed during the period of April 1 - June 30 but the usage of the website continues to grow. Over 468,000 unique users were served in 2016 and web statistics for the first 6 months of 2017 now show a 75% increase in usage over 2016. Expectations are we will hit 1 million users in 3 years. While word-of-mouth and Google searches are the source of much traffic, our web statistics show the single highest usage now comes from the State of Minnesota, which includes multiple state agencies as well as the University of Minnesota. Our plant images are in high demand for other educational and outreach purposes, including interpretive signs, PowerPoint presentations, and invasive species fact sheets. Our field work puts us in contact with many state parks, nature centers and educational institutions across the state where we promote the project to their staff and visitors. During the past 3 years we partnered with the DNR State Parks and Trails on their wildflower geocaching program, were profiled in the Minnesota Conservation Volunteer magazine, and gave presentations about the project to the Minnesota Native Plant Society, the Minnesota Wetlands Professionals Association, the Minnesota Landscape Arboretum, Master Naturalists, Master Gardeners, Wild Ones and several garden clubs.

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget Overview:

Budget Category	\$ Amount	Explanation
Personnel:	\$ 119,189	Field survey: .08FTE for 3yrs - P. Dziuk Web publishing: .67FTE for 3 yrs - K. Chayka (base salary for each \$53372/yr, no benefits)
Professional/Technical/Service Contracts:	\$	NA
Equipment/Tools/Supplies:	\$ 2,512	Camping gear, batteries, miscellaneous photography equipment, maps (both printed and for GPS), graphics software
Capital Expenditures over \$5,000:	\$	NA
Fee Title Acquisition:	\$	NA
Easement Acquisition:	\$	NA
Easement – Long-term Monitoring, Management, and Enforcement	\$	NA
Professional Services for Fee Title and Easement Acquisition:	\$	NA
Printing:	\$	NA
Travel Expenses in MN:	\$ 28,299	Field work mileage (13000/yr, statewide), parking, permits, lodging for 45-50 nights/yr, food for overnight trips plus 10-15 day trips/yr (the preferred and least expensive lodging option is tent camping at state parks and other public lands)
Other:	\$	NA
TOTAL ENRTF BUDGET:	\$ 150,000	

Explanation of Use of Classified Staff: N/A

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

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 2.25 (~.75 FTE x 3 years)

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
Non-state	\$ 10,000	\$ 10,730	Operating costs, field tablet and software, photographic equipment, out-of-state travel, accounting services
TOTAL OTHER FUNDS:	\$10,000	\$10,730	

VII. PROJECT STRATEGY:

A. Project Partners: A primary partner presently is the Bell Museum of Natural History for the purpose of ensuring permanency of public access to the online field guide and also as a repository of all high resolution

images collected by the project. The Bell also provides access to physical specimens for our review, records in their database not readily accessible to the general public, and species identification clarification when requested. The project is also increasingly attracting individual collaborators or contributors that can provide for reliable field observations for species' locations or high quality habitats, as well as providing phenological reports in out-state locations. Plans are being made to incorporate relevant pollinator information, provided by the Xerces Society or other agencies and/or qualified individuals. Volunteer contributors have provided species write-ups on species for which they have experience and in-depth knowledge as well as high quality digital images. These are informal partnerships of various contribution levels or time commitment, but collectively meaningful to date and a high future potential.

B. Project Impact and Long-term Strategy: Increases in online usage of just the past several years demonstrates the dramatic future potential of the online field guide. Of two factors that drive usage (presence on internet over time and volume of content), this project's greatest contribution will be towards the latter. It can be expected usage will nearly double, approaching .5M users annually in the 3 year period of this funding cycle. Continued funding will be sought beyond the present period, as well as from other sources.

C. Spending History:

Funding Source	M.L. 2008 or FY09	M.L. 2009 or FY10	M.L. 2010 or FY11	M.L. 2011 or FY12-13	M.L. 2013 or FY14
NA – the project has previously been funded by volunteers					

VIII. ACQUISITION/RESTORATION LIST:

NA

IX. VISUAL ELEMENT:



X. ACQUISITION/RESTORATION REQUIREMENTS WORKSHEET:

NA

XI. RESEARCH ADDENDUM:

NA

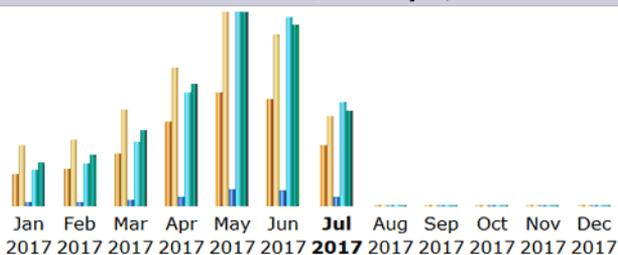
XII. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted no later than January 30, 2015, November 30, 2015, April 30, 2016, November 30, 2016, and April 30, 2017. A final report and associated products will be submitted between June 30 and August 30, 2017.



Environment and Natural Resources Trust Fund								
M.L. 2014 Project Budget								
Project Title: Expansion of Minnesota Wildflowers Online Botanical Reference								
Legal Citation: <i>M.L. 2014, Chp. 226, Sec. 2, Subd. 05n</i>								
Project Manager: Catherine Chayka								
Organization: Minnesota Wildflowers Info								
M.L. 2014 ENRTF Appropriation: \$ 150,000								
Project Length and Completion Date: 3 years ending June 30, 2017								
Date of Report: July 17, 2017								
ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET								
	Activity 1 Budget	Amount Spent	Activity 1 Balance	Activity 2 Budget	Amount Spent	Activity 2 Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	<i>Field survey and Photography</i>			<i>Publishing to web</i>				
Personnel (Wages and Benefits)	\$11,928	\$11,928	\$0	\$107,261	\$107,261	\$0	\$119,189	\$0
Catherine Chayka, Project manager: \$107,772 (100% salary); .67 FTE for 3 yrs.								
Peter Dziuk, Field Survey Coord. & Photographer: \$12,318 (100% salary); .08 FTE for 3 yrs								
Equipment/Tools/Supplies	\$1,838	\$1,838	\$0	\$674	\$674	\$0	\$2,512	\$0
Software: photo editing and Garmin maps (~\$870)								
Field maps (~\$60)								
Photographic supplies, camera, batteries (~\$1480)								
Camping supplies (~\$150)								
Travel expenses in Minnesota	\$28,299	\$28,299	\$0				\$28,299	\$0
Mileage, throughout MN: ~12000/yr								
Lodging: 40-50 nights/yr								
Food: overnight plus 10-15 day trips/yr								
Parking and permits								
COLUMN TOTAL	\$42,065	\$42,065	\$0	\$107,935	\$107,935	\$0	\$150,000	\$0

Monthly history as of July 17, 2017



Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Jan 2017	26,899	51,829	154,999	1,545,953	33.60 GB
Feb 2017	31,438	56,897	174,540	1,825,963	39.28 GB
Mar 2017	44,107	82,180	245,613	2,762,328	58.44 GB
Apr 2017	71,869	118,366	416,015	4,914,456	93.13 GB
May 2017	97,192	165,213	705,363	8,420,103	148.21 GB
Jun 2017	91,449	146,279	680,193	8,217,640	138.35 GB
Jul 2017	51,676	77,071	376,016	4,495,631	72.88 GB
Aug 2017	0	0	0	0	0
Sep 2017	0	0	0	0	0
Oct 2017	0	0	0	0	0
Nov 2017	0	0	0	0	0
Dec 2017	0	0	0	0	0
Total	414,630	697,835	2,752,739	32,182,074	583.89 GB

Daily history for May, 2017

Day	Number of visits	Pages	Hits	Bandwidth	Day	Number of visits	Pages	Hits	Bandwidth
01 May 2017	4,876	19,420	220,232	4.19 GB	17 May 2017	4,946	20,879	244,189	4.37 GB
02 May 2017	4,811	16,275	201,889	4.04 GB	18 May 2017	5,089	23,095	259,184	4.55 GB
03 May 2017	4,770	16,610	205,579	3.97 GB	19 May 2017	4,817	23,054	248,622	4.30 GB
04 May 2017	4,972	19,519	225,668	4.31 GB	20 May 2017	4,780	18,073	220,842	4.01 GB
05 May 2017	4,895	18,043	224,410	4.06 GB	21 May 2017	5,546	21,826	260,252	4.75 GB
06 May 2017	5,228	18,844	244,007	4.17 GB	22 May 2017	5,389	24,613	291,978	5.17 GB
07 May 2017	6,155	25,190	297,770	5.09 GB	23 May 2017	4,865	23,845	272,680	4.93 GB
08 May 2017	5,892	25,449	301,615	5.50 GB	24 May 2017	4,953	23,200	271,819	4.81 GB
09 May 2017	5,376	21,896	260,639	4.72 GB	25 May 2017	4,933	24,534	276,727	5.06 GB
10 May 2017	5,427	24,251	285,967	4.83 GB	26 May 2017	5,228	23,388	285,124	4.65 GB
11 May 2017	5,609	22,543	278,985	4.77 GB	27 May 2017	5,637	21,664	281,929	4.53 GB
12 May 2017	5,186	21,909	266,323	4.41 GB	28 May 2017	6,487	25,097	330,079	5.15 GB
13 May 2017	5,083	18,680	244,805	4.08 GB	29 May 2017	6,790	31,262	377,713	6.59 GB
14 May 2017	5,437	19,549	256,639	4.52 GB	30 May 2017	5,853	34,348	381,637	6.89 GB
15 May 2017	5,602	25,104	296,240	5.10 GB	31 May 2017	5,247	28,820	324,448	5.67 GB
16 May 2017	5,334	24,383	282,112	5.02 GB	Average	5,329	22,753	271,616	4.78 GB
					Total	165,213	705,363	8,420,103	148.21 GB