Environment and Natural Resources Trust Fund (ENRTF)
M.L. 2015 Work Plan

Date of Report: June 2, 2015

Date of Next Status Update Report: January 1, 2016

Date of Work Plan Approval:

Project Completion Date: June 30, 2018

Does this submission include an amendment request? _No_

PROJECT TITLE: Endangered Bats, White-Nose Syndrome, and Forest Habitat

Project Manager: Richard Baker

Organization: MN DNR

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Location: Statewide

Total ENRTF Project Budget:		
	ENRTF Appropriation:	**$1,250,000**
	Amount Spent:	**$0**
	Balance:	**$1,250,000**

Legal Citation: M.L. 2015, Chp. 76, Sec. 2, Subd. 03i

Appropriation Language:
$1,250,000 the first year is from the trust fund to the commissioner of natural resources in cooperation with the University of Minnesota and the U.S. Forest Service to survey and radio-track endangered bats to define and understand summer forest habitat use in order to minimize forestry impacts and mitigate white-nose syndrome disease impacts. This appropriation is available until June 30, 2018, by which time the project must be completed and final products delivered.

I. PROJECT TITLE: Endangered Bats, White-Nose Syndrome, and Forest Habitat

II. PROJECT STATEMENT:

The Minnesota Department of Natural Resources proposes a partnership with the University of Minnesota and the U.S. Forest Service to learn how to best protect bat summer habitat in Minnesota's forests. This project will build upon a pilot project being jointly implemented in 2014 by the DNR, Superior National Forest (SNF), and Camp Ripley Training Center.

Background and Significance

- Bats are a critical component of Minnesota's ecosystems. A single bat may eat 1,000 insects per hour, and the state's half million bats provide many millions of dollars in pest control each year.
- Seven species of bats are found in Minnesota. Four of these bat species (northern long-eared bat, tricolored bat, little brown bat, and big brown bat) hibernate in caves during the winter, and disperse widely across the state in spring, summer, and fall. These four cave-hibernating bats are all Species of Special Concern in Minnesota.
- Many cave bats use trees for roosting and raising young. Very little is known about this summer habitat. In October 2013, the U.S. Fish and Wildlife Service (USFWS) proposed to list the northern long-eared bat under the federal Endangered Species Act, largely due to the impact of the disease, white-nose syndrome. The Northern long-eared bat was listed on April 2, 2015. The state's three other cave bats are also susceptible to this disease, and may be proposed for listing in the near future.
- While the disease has yet to be observed in Minnesota, the fungus associated with it was detected on bats at Mystery Cave State Park and Soudan Underground Mine State Park in 2013. In the northeastern US, the disease has reduced bat populations by up to 99% over the past decade. Similar declines are expected in Minnesota.
- Bats reproduce very slowly, and successful reproduction will be critical to the four species' survival in the face of white-nosed syndrome and wind turbine fatalities. With the northern long-eared bat listing, the USFWS imposed restrictions on tree cutting between April 1 and September 30. Forest management activities are restricted within 0.25 miles of known hibernacula or maternity roosts, and known roost trees may not be cut. This broad prohibition, and potentially others in the future, will have an enormous impact on the management of Minnesota's 17.4 million acres of forest.
- The listing of Minnesota's cave bats will also affect the future of Minnesota's growing wind energy industry. Wind power is a sustainable energy resource, but fatalities at wind turbines are also having a significant impact on the state's bat populations.
- Collecting acoustic data is an efficient and cost-effective way to survey other bat species in an area, and could provide information on other species of bats in the future.
- Gathering and analyzing existing sonar data and conducting acoustic surveys sequentially across the forested area of Minnesota over three years will create a baseline to evaluate bat presence. If white-nose syndrome appears in Minnesota and begins to affect the bat populations, these data could be used for research and monitoring of bat populations statewide. It is very likely that white-nose syndrome will begin to cause bat mortalities in Minnesota during the timeline of this project, and the data we gather could help quantify the impacts of this disease on all Minnesota bats.
- The information collected about roosts, colony trees, and stands will be used by the DNR, U.S. Forest Service and possibly USFWS to develop forest management recommendations for protecting bat summer habitat in Minnesota.

Objectives

- The project will use available data, surveys, and the latest radio-tracking methods to improve our knowledge of northern long-eared bat summer forest habitat use.
- The project will identify the most critical periods and most critical habitat for bat reproduction in order to more effectively focus any restrictions on tree removal.
- Data will also be collected on the state's three other cave-dwelling bat species for future use as needed.

Activities and Methods

- Review, analyze, and summarize existing unpublished data from acoustic detectors to identify gaps in knowledge about the distribution of bats in Minnesota.
- Use acoustic detectors in areas where acoustic surveys have not been done before.
- Deploy transmitters on northern long-eared bat (NLEB) in the maternity season to identify roost trees.
- Characterize the roost trees and the forest matrix within which NLEB raise young, and use this data to develop appropriate management responses.

III. OVERALL PROJECT STATUS UPDATES:

Project Status as of January 1, 2016:

Project Status as of July 1, 2016:

Project Status as of January 1, 2017:

Project Status as of July 1, 2017:

Project Status as of January 1, 2018:

Overall Project Outcomes and Results:

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Analyze and Summarize Existing Bat Survey Data in Minnesota
Description: The goal of this activity is to analyze all existing Minnesota bat acoustic survey data available. This will allow us to establish bat presence. Existing bat survey data from available sources (Minnesota Department of Natural Resources [DNR], federal agencies, university researchers, private sector consultants, wind industry, etc.) will be collected, analyzed for northern long-eared bat calls, and summarized. We have already identified 17 different studies, some spanning multiple years, within Minnesota, in addition to acoustic data collected on the Minnesota Biological Survey. We will then identify gaps where additional acoustic surveys should be done, and make an initial estimate of distribution of northern long-eared bat (NLEB) in Minnesota.

Range maps of NLEB in the IUCN map for the species (IUCN 2008) include all of Minnesota, but unforested regions in the west and south that were formerly prairie will likely have fewer NLEB. Past acoustic work in southwest Minnesota did not detect NLEB. Therefore, of the study area regions, the northern half of Minnesota will likely have the highest numbers of NLEB.

The existing data were collected under several different protocols which may not meet the U.S. Fish and Wildlife Service (USFWS) data collection guidelines (U.S. Fish and Wildlife Service 2014b), but we will use them as a baseline for NLEB presence in the state. The USFWS guidelines recommend analyzing acoustic data by site and night using two different bat ID programs. We will use a high-frequency filter to determine whether any bat calls were recorded at a site. Then the software programs will be used to identify calls to species, and the results compared between programs. Sites with probable NLEB calls will be confirmed through visual qualitative analysis.

Budget Narrative: Of the $43,378, $10,000 will be used by DNR and $33,378 will be used by the University of Minnesota (UM) to collect, organize, and analyze acoustic data from all existing acoustic surveys for bats in

Minnesota. The budget items for Activity 1 are wages and benefits for both DNR and UM, and an estimated $1,200 for acoustic software for UM.

Summary Budget Information for Activity 1:

ENRTF Budget: $ 43,691
Amount Spent: $ 0
Balance: $ 43,691

Outcome	Completion Date
1. Identify existing sources of bat survey data	December 2015
2. Develop map of existing survey locations	March 2016
3. Analyze recordings for northern long-eared bat calls	March 2016
4. Develop geospatial and database summaries of all northern long-eared bat data	March 2016

Activity Status as of January 1, 2016:

Activity Status as of July 1, 2016:

Project Status as of January 1, 2017:

Project Status as of July 1, 2017:

Project Status as of January 1, 2018:

Final Report Summary:

ACTIVITY 2: Conduct Bat Surveys Throughout Minnesota's Forests

Description: Bats will be surveyed by recording and analyzing their "sonar" calls. Acoustic survey methods will be similar to those of the pilot study conducted by USFS Superior National Forest (SNF) and Minnesota Department of Natural Resources (DNR) personnel in 2013 and 2014, past work by the Minnesota Biological Survey (MBS), and surveys in northeast Minnesota. Surveys will be conducted throughout the forested portion of the state. Bats will be trapped as necessary to strengthen survey results. Survey data will be analyzed for northern long- eared bat calls, and combined with data summarized in Activity 1 to produce a map of the summer distribution of the northern long-eared bat in the forested region of Minnesota.

We will use full spectrum and/or zero crossing detectors to record bats in different forest types (see section II.E). Existing detectors we have are all Anabats. We will follow the survey guidelines developed by the U.S. Fish & Wildlife Service for summer surveys of the endangered Indiana bat (*M. sodalis*). These guidelines recommend a minimum of 4 detector-nights at 2 locations within each 0.5 km^2 site, with acoustic sampling beginning at sunset and ending at sunrise each night. Collecting acoustic data is also an efficient and cost-effective way to survey other bat species in an area, and could provide information on other species of bats in the future.

Budget Narrative: Of the $335,015, $25,000 will be used by DNR, $50,000 will be used by SNF, and $260,015 will be used by the University of Minnesota (UM). DNR and SNF budget items are for wages and benefits to design sampling protocol, deploy detectors, download and analyze acoustic data from new detector locations. UM budget items for Activity 2 are wages and benefits (estimated $122,642), acoustic detectors ($76,000 - 38 estimated at $2,000 each), travel and field expenses (supplies, per diem and mileage expenses ($61,373 estimated).

Summary Budget Information for Activity 2:

ENRTF Budget: $ 337,430
Amount Spent: $ 0
Balance: $ 337,430

Outcome	Completion Date
1. Identify forested areas of the state needing additional bat surveys	March 2016
2. Design additional bat surveys	March 2016
3. Implement bat surveys	September 2016
4. Analyze survey data for northern long-eared bat calls	March 2017
5. Develop geospatial, database, and map summaries of survey data	March 2017

Activity Status as of January 1, 2016:

Activity Status as of July 1, 2016:

Project Status as of January 1, 2017:

Project Status as of July 1, 2017:

Project Status as of January 1, 2018:

Final Report Summary:

ACTIVITY 3: Identify Summer Northern Long-Eared Bat Habitat in Minnesota's Forests
Description: Trapping and radio-tagging bats is a difficult, personnel-intensive, and costly activity. This activity will deploy multiple bat trapping and tracking crews across the forested region of the state. University of Minnesota (UM), Minnesota Department of Natural Resources (DNR), and Superior National Forest (SNF) will collaborate on this activity. At least 3 capture sites with northern long-eared bats will be selected from a sample of forested regions of Minnesota in 2016 and 2017.

Mist-netting and tracking will take place during the maternity season for *Myotis* species of bats, which is generally June 1 – July 15. Mist-nets will be set up along potential travel corridors at each site, and netting will begin at sunset and continue for 3.5-5 hours. Up to 40 female bats will be captured at these sites, equipped with radio transmitters, and tracked to roost sites and maternity colonies. Captured bats will be identified to species, and photographs will be taken of diagnostic features if needed. Captured bats will be marked with numbered wing bands, and personnel will attach radio-transmitters to reproductive female northern long-eared bats of sufficient weight. Colony and roost size will be monitored during the critical reproductive period.

Budget Narrative: Of the $662,076, $40,000 will be used by DNR, $100,000 will be used by SNF, and $522,076 will be used by UM. DNR and SNF budget items are for wages and benefits to deploy mist nets, place radiotransmitters on bats, and monitor roost sites. UM budget items for Activity 3 are wages and benefits (estimated $372,643), radiotransmitters, receivers, and mist net setups ($33,850), travel, and field expenses (supplies, per diem, and mileage expenses ($115,583 estimated).

Summary Budget Information for Activity 3:

ENRTF Budget: $ 666,848
Amount Spent: $ 0
Balance: $ 666,848

Outcome	Completion Date
1. Identify locations with evidence of northern long-eared bat summer populations	March 2016
2. Select study sites for trapping and tracking	March 2016
3. Capture bats, equip with radios, and track to roost sites	September 2017
4. Monitor maternity colonies and roost sites to estimate number of bats present	September 2017

Activity Status as of January 1, 2016:

Activity Status as of July 1, 2016:

Project Status as of January 1, 2017:

Project Status as of July 1, 2017:

Project Status as of January 1, 2018:

Final Report Summary:

ACTIVITY 4: Characterize Summer Northern Long-Eared Bat Habitat in Minnesota

Description: Roosts, colony trees, and stands identified in Activity 3 and randomly selected trees and stands nearby will be ecologically characterized. We will measure roost trees post-maternity season and prior to leaf drop, and will record variables including tree type, tree height, decay class, tree diameter, roost type (e.g. crevice, cavity, under loose bark), and roost height. Comparing used vs. available habitats will determine which ecological variables are important to roost site and habitat selection. Radio tracking data will also be used to estimate home range sizes. The resulting characterization of northern long-eared bat habitat and home range will be used by the Minnesota Department of Natural Resources (DNR) to develop forest management recommendations for protecting bat summer habitat in Minnesota.

To determine landscape attributes that influence species occupancy, habitat covariates will be identified and measured at each site. Potential habitat covariates include cover type, distance to roads and trails, density of roads and trails, distance to water, type of water feature, and Lidar derived estimates of stand height and canopy density. We will evaluate multiple buffer sizes to determine that scale which best predicts species occupancy. We may also add geographic parameters to account for differences in forest type throughout the forested region of Minnesota that may influence northern long-eared bat (NLEB) occupancy. We will also include variables associated with forest harvest (stand age, harvest type, snags, and harvest season) in candidate models.

We will develop a set of candidate occupancy models from the total set of habitat covariates. Combinations of covariates will be selected based on biological significance. We will rank candidate models and use model averaging to create a final model that will be used to map NLEB occupancy across the landscape, similar to what has been done previously for carnivores, warblers, and damselflies. The resulting model could also be used to predict species response to proposed management actions.

Budget Narrative: $200,585 will be used by the University of Minnesota (UM). UM budget items for Activity 4 are wages and benefits (estimated $141,982), and travel and field expenses (supplies, per diem and mileage expenses ($58,603 estimated).

Summary Budget Information for Activity 4:

ENRTF Budget: $ 202,031
Amount Spent: $ 0
Balance: $ 202,031

Outcome	Completion Date
1. Characterize roosts, colony sites, and randomly selected sites nearby	March 2018
2. Summarize data on roosts, colony sites, and home range	June 2018
3. Develop generalized description of roost sites and maternity colonies	June 2018

Activity Status as of January 1, 2016:

Activity Status as of July 1, 2016:

Project Status as of January 1, 2017:

Project Status as of July 1, 2017:

Project Status as of January 1, 2018:

Final Report Summary:

V. DISSEMINATION:
Description: We will create a website to distribute information to the public, but this will be done after the project starts. The website will be modelled after other websites we maintain (e.g., www.nrri.umn.edu/moose).

In addition, we will also prepare and submit papers for publication in peer-reviewed journals.

We will also probably have periodic contact with print and broadcast media, given the nature of the project. These contacts will be documented.

Activity Status as of January 1, 2016:

Activity Status as of July 1, 2016:

Project Status as of January 1, 2017:

Project Status as of July 1, 2017:

Project Status as of January 1, 2018:

Final Report Summary:

VI. PROJECT BUDGET SUMMARY:
A. ENRTF Budget Overview:

Budget Category	$ Amount	Overview Explanation
DNR Total = $83,946		

Personnel:	$ 75,000	DNR Personnel: 1 project technician (salary/fringe) at 0.5 FTE for 1 year; 1 project technician (salary benefits) at 0.5 FTE for 1 year; 1 data manager (salary/fringe) at 0.17 FTE each year for 3 years.
Direct Support Services	$ 8,946	Direct Support Services. DNR's direct and necessary costs pay for activities that are directly related to and necessary for accomplishing appropriated programs/projects. In addition to itemized costs captured in our proposal budget, direct and necessary costs cover HR Support (~$1,989), Safety Support (~$492), Financial Support (~$975), Communication Support (~$1,141), IT Support (~$3,410), Planning Support (~$704), Procurement Support (~$235), and division and regional program management (~$0) that are necessary to accomplishing funded programs/projects.
Professional/Technical/Service Contracts:		
1. University of Minnesota – contract Total=$1,016,054		
Personnel	$ 669,445	UM Personnel: 1 project coordinator (salary/benefits) at 1 FTE each year for 3 years; 1 field manager (salary/benefits) at 0.5 FTE for 1 year; 2 field managers (salary/benefits) each at 0.5 FTE each year for 2 years; project technician (salary/benefits) at 0.5 FTE for 1 year; 4 project technicians (salary/benefits) each at 0.5 FTE each year for 2 years; 1 project technician (salary/benefits) at 1 FTE for 1 year; 1 ecologist (salary/benefits) at 1 FTE for 1 year
Equipment/Tools/Supplies:	$ 114,050	Acoustic detectors (38), transmitters (135), receivers and antennae (8), software (1), and nets, poles, and pulleys (7); field supplies, e.g., bug spray, gloves, batteries
Travel Expenses in MN:	$ 232,559	In-state travel mileage for all project activities and field Expenses (lodging & meals): 19 staff field seasons x 24 wk/season @ $450/wk
2. Superior National Forest – contract Total=$150,000		
Personnel	$ 150,000	SNF (contract) Personnel: 2 project technicians (salary/benefits) at 0.5 FTE for 1 year; 2 project technicians (salary/benefits) at 0.5 FTE each year for 2 years
TOTAL ENRTF BUDGET:	**$ 1,250,000**	

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

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

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 1.50 FTEs

Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: 8.67 FTEs

B. Other Funds:

Source of Funds	$ Amount Proposed	$ Amount Spent	Use of Other Funds
Non-state			
Secured			
Superior National Forest and Chippewa National Forest	$ 145,000	$ 0	Supplement acoustic surveys, netting, and roost/colony monitoring on U.S. Forest Service lands
Blandin Foundation	$ 7,500		Acoustic detection, mist-netting and radiotelemetry.
Pending			
NCASI	$ 25,000		Acoustic detection, mist-netting and radiotelemetry on NLEB and other species.
Camp Ripley Training Center	$ 65,200	$ 0	Training Center staff have applied for Department of Defense Legacy Resource Management Program grant to supplement acoustic surveys, netting, and roost/colony monitoring in Camp Ripley
Minnesota's Lake Superior Coastal Program Grants	$ 15,000	$ 0	UMD has submitted a proposal for additional bat monitoring in the Lake Superior watershed
Minnesota's Lake Superior Coastal Program Grants	$ 50,000		UMD will be submitting a proposal for additional bat monitoring in the Lake Superior watershed
Sea Grant	$ 200,000	$ 0	UMD will be submitting a proposal to support expansion of the project in the vicinity of the St. Louis River Estuary
State			
Nongame Wildlife Program Staff Time (in-kind)	TBD	$ 0	Various
TOTAL OTHER FUNDS:	**$ 475,200**	**$ 0**	

VII. PROJECT STRATEGY:

A. Project Partners:

The overall project will be managed by the DNR's Division of Ecological and Water Resources (Richard

Baker, Endangered Species Coordinator, and Gerda Nordquist, Minnesota Biological Survey Mammalogist) in close cooperation with the Division of Forestry (Amber Ellering, Planner). Project Coordination and Implementation will be handled by the University of Minnesota, Duluth/Natural Resources Research Institute (Dr. Ron Moen, Mammalogist) in cooperation with the U.S. Forest Service.

B. Project Impact and Long-term Strategy:

This project will provide scientific data on the timing and use of forest stands and individual trees by northern long-eared bats during summer. These data will allow the DNR to develop forest management recommendations for protecting bat summer habitat in Minnesota more effectively than would a broad tree removal prohibition. When, as expected, white-nose syndrome infects the state's bat populations, the results of this project will be valuable in mitigating the disease's impacts on all cave bat species. The project's results will also be useful to on-going efforts to mitigate the impacts of wind power development on the state's bat populations. Additional funding will not be required to meet these goals.

C. Funding History:

Funding Source and Use of Funds	Funding Timeframe	$ Amount
A pilot project is being jointly implemented by DNR, Superior National Forest, and Camp Ripley Training Center in 2014 to test methodology that will be used in the proposed ENRTF project. Support for the pilot project is being shared by the DNR (Division of Ecological and Water Resources, Division of Parks and Trails, Division of Forestry), Superior National Forest, U.S. Fish and Wildlife Service, and Camp Ripley Training Center.	2014	$ 117,570

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

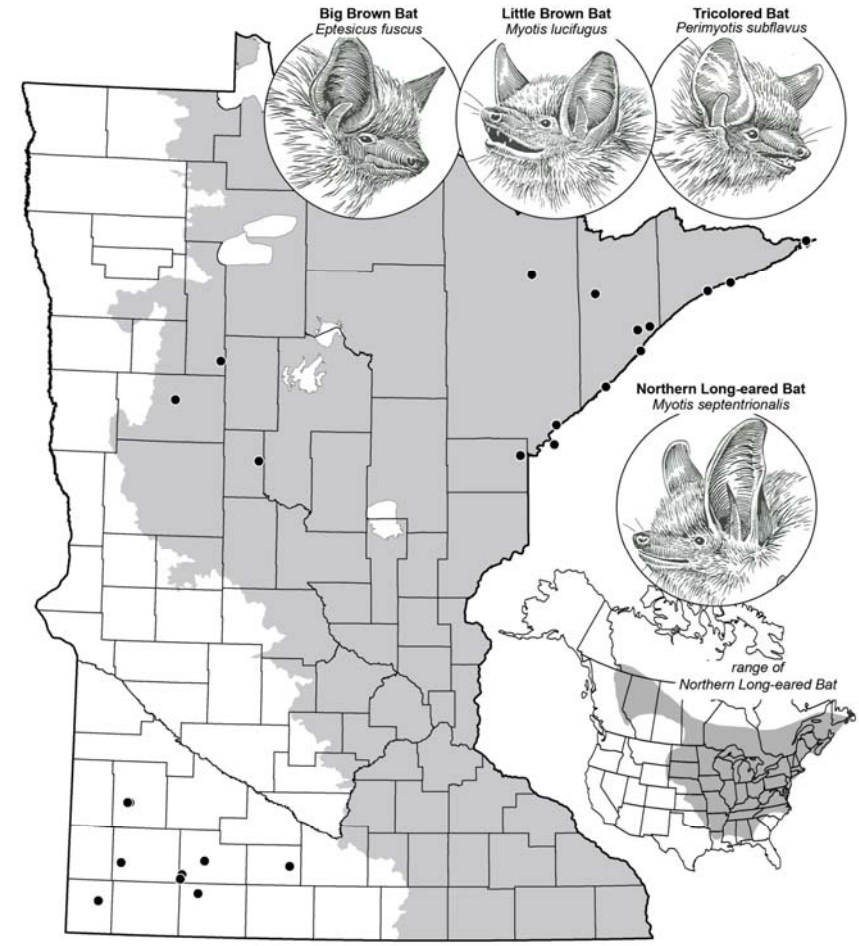
A. Parcel List:

N/A

B. Acquisition/Restoration Information:

N/A

IX. VISUAL COMPONENT or MAP(S):



Map of Minnesota showing:

- forested portion of the state that will be focus of project (shaded)
- locations of acoustic bat surveys as of 2008 (dots)
- range of Northern Long-eared Bat in North America (inset)
- Minnesota's cave-hibernating bat species Illustrations by Don Luce, courtesy of the James Ford Bell Museum of Natural History

X. RESEARCH ADDENDUM:

See attached Research Addendum.

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted no later than January 1, 2016; July 1, 2016; January 1, 2017; July 1, 2017; and January 1, 2018. A final report and associated products will be submitted between June 30 and August 15, 2018.

Environment and Natural Resources Trust Fund
M.L. 2015 Project Budget

Project Title: Endangered Bats, White-Nose Syndrome, and Forest Habitat
Legal Citation: M.L. 2015, Chp. 76, Sec. 2, Subd. 03i
Project Manager: Richard Baker
Organization: MN DNR
M.L. 2015 ENRTF Appropriation: **$** 1,250,000
Project Length and Completion Date: 3 years, June 30, 2018
Date of Report: 02 June 2015

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Activity 1 Balance	Activity 2 Budget	Amount Spent	Activity 2 Balance	Activity 3 Budget	Amount Spent	Activity 3 Balance	Activity 4 Budget	Amount Spent	Activity 4 Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	***Analyze and Summarize Existing Bat Survey Data in Minnesota***			***Conduct Bat Surveys Throughout Minnesota's Forests***			***Identify Summer Northern Long-Eared Bat Habitat in Minnesota's Forests***			***Characterize Summer Northern Long-Eared Bat Habitat in Minnesota***				
Personnel (Wages and Benefits)	$10,000	$0	$10,000	$25,000	$0	$25,000	$40,000	$0	$40,000	$0	$0	$0	$75,000	$75,000
2 Project Technician years: $50,000 (salary/fringe); 50% FTE (est $50,000)														
Data Manager (DNR): $50,000 (salary/fringe); 17% FTE each year for 3 yrs (est $25,000)														
Other	$313	$0	$313	$2,415	$0	$2,415	$4,772	$0	$4,772	$1,446	$0	$1,446	$8,946	$8,946
Direct Support Services. DNR's direct and necessary costs pay for activities that are directly related to and necessary for accomplishing appropriated programs/projects. In addition to itemized costs captured in our proposal budget, direct and necessary costs cover HR Support (~$1,989), Safety Support (~$492), Financial Support (~$975), Communication Support (~$1,141), IT Support (~$3,410), Planning Support (~$704), Procurement Support (~$235), and division and regional program management (~$0) that are necessary to accomplishing funded programs/projects.														
Professional/Technical/Service Contracts with DNR														
1. University of Minnesota Contract ($1,016,054)														
Personnel (Wages and Benefits)	$32,178	$0	$32,178	$122,642	$0	$122,642	$372,643	$0	$372,643	$141,982	$0	$141,982	$669,445	$669,445
Project Coordinator (UM): $69,700 (salary/fringe); 100% FTE each year for 3 yrs (est. $209,066)														
5 Field Manager years (UM): $56,610 (salary/benefits) each at 50% FTE (est. $141,510)														
11 Project Technician years (UM): $47,685 (salary/benefits) each at 50% FTE (est. $262,265)														
Ecologist (UM): $56,604 (salary/benefits) at 100% FTE for 1 year (est. $56,604)														
Equipment/Tools/Supplies	$1,200	$0	$1,200	$76,500	$0	$76,500	$36,350	$0	$36,350	$0	$0	$0	$114,050	$114,050
Acoustic detectors (38 @ est. $2,000), Transmitters (135 @ est. $150), Receivers and antennae (8 @ est. $1,000), Acoustic software (1 @ est. $1,200), Mist nets, poles, pulleys (7 @ est. $800), Field supplies (e.g., bug spray, gloves, batteries) est. $3,000)).														
Travel expenses in Minnesota	$0	$0	$0	$60,873	$0	$60,873	$113,083	$0	$113,083	$58,603	$0	$58,603	$232,559	$232,559
Field travel estimated lodging and meals for ~19 staff x 24 weeks/field season (~$450/week per staff), In-state travel mileage ($0.56/mi) for all project activities.														
2. Superior National Forest Contract ($150,000)														
Personnel (Wages and Benefits)	$0	$0	$0	$50,000	$0	$50,000	$100,000	$0	$100,000	$0	$0	$0	$150,000	$150,000
6 Project Technician years (SNF): $50,000 (salary/benefits) at 50% FTE ($150,000)														
COLUMN TOTAL	**$43,691**	**$0**	**$43,691**	**$337,430**	**$0**	**$337,430**	**$666,848**	**$0**	**$666,848**	**$202,031**	**$0**	**$202,031**	**$1,250,000**	**$1,250,000**