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

**Project Title:** **ENRTF ID:** **004-A**

Endangered Bats, White-Nose Syndrome, and Forest Habitat

**Category:** A. Foundational Natural Resource Data and Information

**Total Project Budget: $** 1,269,546

**Proposed Project Time Period for the Funding Requested:** 3 years, July 2015 - June 2018

**Summary:**

The DNR, University of Minnesota, and Forest Service will survey and radio-track endangered bats to define poorly understood summer forest breeding habitat and mitigate disease impacts.

**Name:** Richard Baker

**Sponsoring Organization:** MN DNR

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St. Paul MN 55155

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**Web Address** http://www.dnr.state.mn.us/eco/nhnrp

**Location**

**Region:** Statewide

**County Name:** Statewide

**City / Township:**

**Alternate Text for Visual:**

A map showing the forested region of the state, locations of bat surveys as of 2008, and the North American range of the northern long-eared bat is provided, along with figures of the state's four cave bat species.

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

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

## I. PROJECT STATEMENT

The DNR 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, and Camp Ripley Training Center.

**Background**

- 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.
- Four Minnesota 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.
- Many cave bats use trees for roosting and raising young. Very little is known about this summer habitat.

**Need**

- In October 2013, the U.S. Fish and Wildlife Service 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 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. If the northern long-eared bat is listed, the U.S. Fish and Wildlife Service will likely impose restrictions on tree cutting between April 1 and September 30. Trees over three inches in diameter will need to be surveyed for bat activity before they are cut. This broad prohibition would have an enormous impact on the management of Minnesota's 17.4 million acres of forest.
- The likely 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.

**Results/Benefits**

- 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.

## II. PROJECT ACTIVITIES AND OUTCOMES

**Activity 1: Analyze and Summarize Existing Bat Survey Data in Minnesota** **Budget: $89,000**

Bats are surveyed by recording and analyzing their "sonar" calls. Existing bat survey data from available sources (MNDNR, federal agencies, university researchers, private sector consultants, wind industry, etc.) will be collected, analyzed for northern long-eared bat calls, and summarized.

| 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 2: Conduct Bat Surveys Throughout Minnesota's Forests** **Budget: $307,000**

Surveys to collect recordings of bat sonar calls 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.

| 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 |
| 6. Develop geospatial, database, and map summaries of survey data | March 2017 |

**Activity 3: Identify Summer Northern Long-Eared Bat Habitat in Minnesota's Forests** **Budget: $603,600**

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. Sites with northern long-eared bats will be selected from a sample of forest types. Up to 40 female bats will be captured at these sites, equipped with radio transmitters, and tracked to roost sites and maternity colonies. Colony and roost size will be monitored during the critical reproductive period.

| 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 4: Characterize Summer Northern Long-Eared Bat Habitat in Minnesota** **Budget: $164,000**

Roosts, colony trees, and stands identified in Activity 3 and randomly selected trees and stands nearby will be ecologically characterized. Radio tracking data will be used to estimate home range sizes. The resulting characterization of northern long-eared bat habitat and home range will be used by the DNR to develop forest management recommendations for protecting bat summer habitat in Minnesota.

| 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 |

## III. PROJECT STRATEGY

### A. Project Team/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, WNS 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. Timeline Requirements

This project is designed to support two full field seasons during which NLEB can be trapped, equipped with radio transmitters, and tracked to roost habitat.

# 2015 Detailed Project Budget

**Project Title: Endangered Bats, White-Nose Syndrome, and Forest Habitat**

**IV. DNR TOTAL ENRTF REQUEST BUDGET: 3 years** **$ 83,946**

| BUDGET ITEM | AMOUNT | |
|---|---|---|
| **Personnel:** | $ | 75,000 |
| 1. Project Technician for existing data analysis: 1 x .5 FTE (salary/benefits) for 1 yr | 25,000 | |
| 2. Project Technician for bat surveys: 1 x .5 FTE (salary/benefits) for 1 yr | 25,000 | |
| 3. Data Manager for all project phases: .17 FTE (salary/benefits) for 3 yrs | 25,000 | |
| **Additional Budget Items:** | $ | 8,946 |
| 1. 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. | $ 8,946 | |

**IV. SNF (Contract) TOTAL ENRTF REQUEST BUDGET: 2 years** **$ 150,000**

| | | |
|---|---|---|
| **Personnel:** | $ | 150,000 |
| 1. Project Technicians for bat surveys: 2 x .5 FTE (salary/benefits) for 1 yr | 50,000 | |
| 2. Project Technicians for summer habitat study: 2 x .5 FTE (salary/benefits) for 2 yrs | 100,000 | |

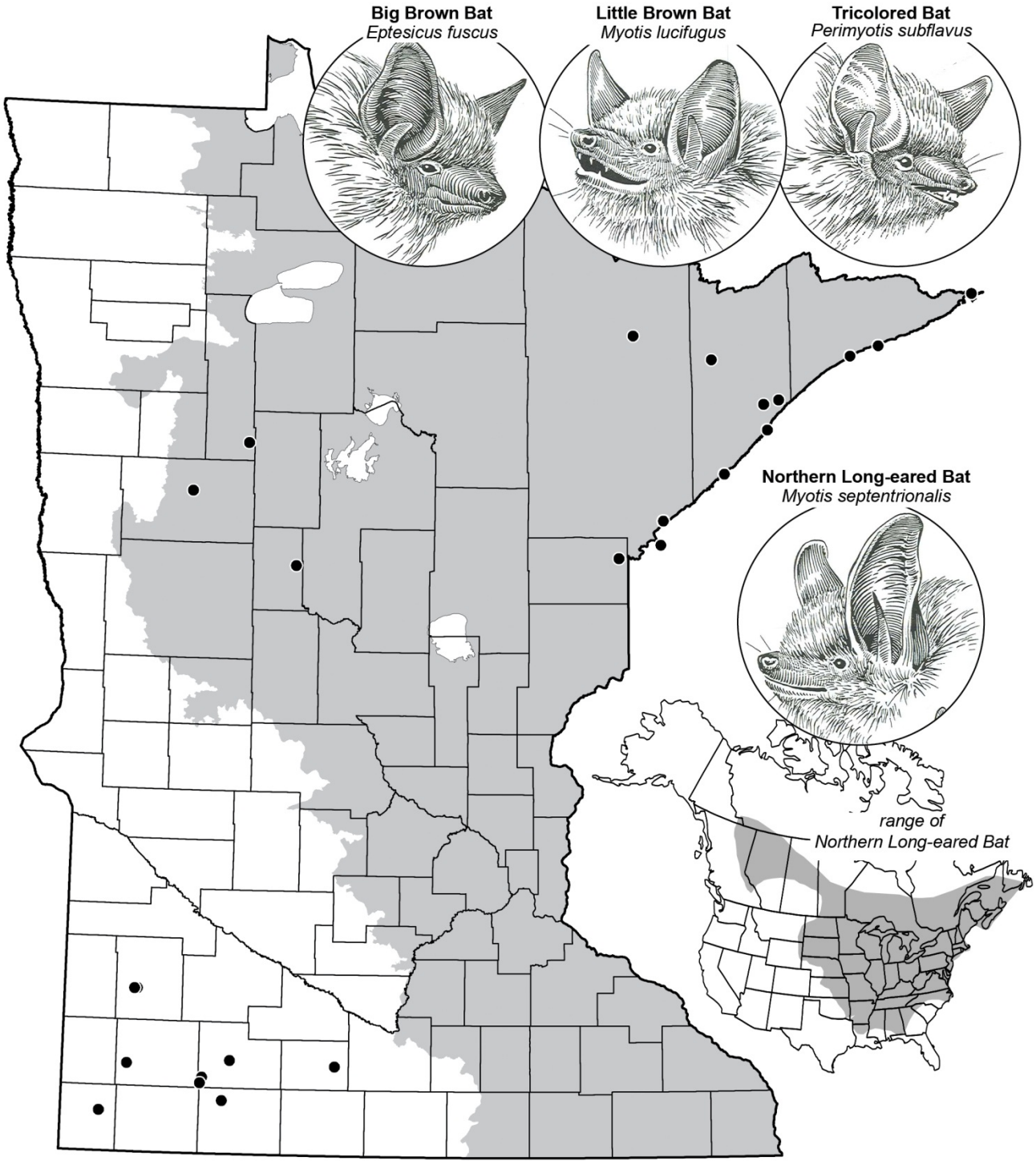
**IV. UM (Direct Appropriation) TOTAL ENRTF REQUEST BUDGET: 3 years** **$ 1,035,600**

| | | |
|---|---|---|
| **Personnel:** | $ | 710,000 |
| 1. Project Coordinator for all project activities: 1 x 1FTE (salary/benefits) for 3 yrs | 225,000 | |
| 2. Field Manager for bat surveys: 1 x .5 FTE (salary/benefits) for 1 yr | 30,000 | |
| 3. Field Managers for summer habitat study: 2 x .5 FTE (salary/benefits) for 2 yrs | 120,000 | |
| 4. Project Technicians for bat surveys: 1 x .5 FTE (salary/benefits) for 1 yr | 25,000 | |
| 5. Project Technicians for summer habitat study: 4 x .5 FTE (salary/benefits) for 2 yrs | 200,000 | |
| 6. Project Technician for habitat charaterization: 1 FTE (salary/benefits) for 1 yr | 50,000 | |
| 7. Ecologist for habitat characterization: 1 FTE (salary/benefits) for 1 yr | 60000 | |
| **Equipment/Tools/Supplies (all purchases by UM; non-expendibles retained by UM):** | $ | 61,600 |
| 1. Acoustic detectors: 20 @ $2,000 ea | 40000 | |
| 2. Transmitters: 40 @ $200 ea | 8000 | |
| 3. Receivers and antennae: 8 @ $1,000 ea | 8000 | |
| 4. Nets, poles, and pulleys: 8 @ $1,000 ea | 5600 | |
| **Travel:** | $ | 264,000 |
| 1. Mileage for all project activities | 36000 | |
| 2. Field Expenses (lodging & meals): 19 staff field seasons x 24 wk/field season @ $500/wk | 228000 | |

| | | |
|---|---|---|
| **TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =** | $ | 1,269,546 |

**V. OTHER FUNDS**

| SOURCE OF FUNDS | AMOUNT | Status |
|---|---|---|
| **Other Non-State $ To Be Applied To Project During Project Period:** | | |
| 1. Camp Ripley Training Center staff has applied for a Department of Defense Legacy Resource Management Program grant to supplement acoustic surveys, netting, and roost/colony monitoring on Camp Ripley. | $ 65,200 | Pending |
| 2. Superior National Forest and Chippewa National Forest will supplement acoustic surveys, netting, and roost/colony monitoring on U.S. Forest Service lands. | $ 145,000 | Secured |
| 3. Coastal Zone Program grant to UMN will supplement acoustic surveys along the shore of Lake Superior (50% CZP:50% UM) | $ 12,000 | Secured |
| **Other State $ To Be Applied To Project During Project Period:** | N/A | |
| **In-kind Services To Be Applied To Project During Project Period:** | | |
| 1. Nongame Wildlife Program staff time will be contributed as opportunity allows | TBD | Pending |
| **Funding History:** | | |
| 1. 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. | $ 117,570 | Secured |
| **Remaining $ From Current ENRTF Appropriation:** | N/A | |




**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

**Environment and Natural Resources Trust Fund (ENRTF)**
**2015 Main Proposal**
**Project Title:** Defining Endangered Bat Habitat for Summer Forest Management

**Project Manager Qualifications**


Project Manager: Richard Baker, Endangered Species Coordinator
Affiliation: Department of Natural Resources, Division of Ecological and Water Resources
Mailing Address: 500 Lafayette Rd., St. Paul, MN 55155
Telephone: 651-259-5073
Email: richard.baker@state.mn.us


Rich Baker has been Endangered Species Coordinator for the DNR since 2008. Prior to that, he served as Research Coordinator for the DNR's Nongame Wildlife Program since 1987. In that position, Rich administered over one hundred research projects on a wide range of topics (see http://www.dnr.state.mn.us/eco/nongame/projects/research_reports/index.html for access to project reports that have resulted from Baker's work in this capacity). Large survey project s managed by Baker include studies of bald eagles, common loons, and Canada lynx.

Prior Employment:

1984-1987 Natural Resource Specialist
Division of Resource Management and Research
National Park Service, San Francisco, CA

1983-1984 Pre-Doctoral Fellow
Smithsonian Institution, Washington, DC

Education:

1983 Master of Science, Wildlife Ecology and Conservation Biology
Cornell University, Ithaca, NY

1978 Bachelor of Science, Plant Ecology and Anthropology
Evergreen State College, Olympia, WA

**Project Leader Qualifications**

Ronald A. Moen, Natural Resources Research Institute, University of Minnesota Duluth

Dr. Moen is a research associate at the Natural Resources Research Institute, adjunct assistant professor in the Dept. of Biology at the University of Minnesota Duluth, with appointments in the graduate programs of Integrated Biological Science (Duluth campus) and Conservation Biology (Twin Cities campus).

**Education**
University of Minnesota, Wildlife Conservation, Ph.D. 1995
University of Minnesota, Wildlife, M.S. 1988
Cornell University, Biological Sciences, B.S. 1984