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

Project Title: **ENRTF ID:** **031-A**

Enhancing Future Forest Conservation Using Gullions Historic Research

Category: A. Foundational Natural Resource Data and Information

Total Project Budget: $ 75,885

Proposed Project Time Period for the Funding Requested: 2 years, July 2015 - June 2017

Summary:

This project will preserve the Gullion ruffed grouse data sets in a series of 2 to 3 phases over the next 4 to 6 years as permanent digital data files.

Name: Kent Montgomery

Sponsoring Organization: Central Lakes College

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Brainerd MN 56401

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Location

Region: Statewide

County Name: Carlton, Mille Lacs

City / Township:

Alternate Text for Visual:

The shaded areas represent the locations of the field locations where Gordon Gullion collected data on the biology of the ruffed grouse that is represented on the deteriorating storage materials.

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

PROJECT TITLE: Enhancing Future Forest Conservation Using Gullion's Historic Research

I. PROJECT STATEMENT

Prior to his untimely death in 1991, Dr. Gordon W. Gullion was universally recognized as the world's foremost authority on ruffed grouse. Dr. Gullion began his landmark study of ruffed grouse ecology and habitat management in 1958 under the auspices of the University of Minnesota at the Cloquet Forestry Center, the Minnesota Department of Natural Resources Mille Lacs Wildlife Management Area and the privately owned Crow Wing Study Area. Dr. Gullion's efforts followed those of Dr. Ralph King who initiated Ruffed Grouse research at Cloquet in the 1930's at the urging of Aldo Leopold. A gap in research occurred from the late 1930's until the mid-1950's at which time Dr. William H. Marshall re-opened the research efforts which included backtagging of ruffed grouse followed by pioneering research in the use of radio-telemetry to study ruffed grouse movements. The longevity and breadth of this research is unparalleled in the profession.

Over 69,000 individual data records were collected on hard copy edge punched field data forms. These irreplaceable data include records documenting ruffed grouse habitat use throughout the year, food habits, reproductive success and mortality factors that when used in concert, provide an assessment of ruffed grouse ecology that is the very foundation of ruffed grouse habitat and population management throughout much of the range of this important game bird, particularly the Great Lakes region. The forest management strategies designed to sustain habitats for ruffed grouse have been demonstrated equally beneficial to many species of nongame wildlife, including the seriously imperiled golden-winged warbler (petitioned for protection under the federal Endangered Species Act - February 2010).

Unfortunately, the hard copy data forms are slowly deteriorating to the point that if they are not soon converted to a more permanent medium, the information they contain will be lost forever – and with it an important chapter in the history of wildlife conservation in Minnesota. The loss of these data would seriously compromise efforts of today's resource management professionals to gain new insight into ruffed grouse ecology and management using recent statistical procedures unavailable to Gullion and his predecessors.

Also, Dr. Gullion, had at the time of his death, over 50 uncompleted technical papers and one book length manuscript describing his personal 30 years of research on Ruffed Grouse. Conversion of the data to current digital format standards is necessary to efficiently complete these manuscripts and eventually seek to have those published in memory of Dr. Gullion's 30-year research endeavor.

Permanent digital preservation of the data sets in an MS Access data format that can be efficiently analyzed using the latest analytical tools and statistical software to guide the development of forest wildlife conservation policies and practices. Following the entry of the first summer's data, a small number of the most completed manuscripts will be selected to finalize. Data retrieval and analysis methods will be tested using MS Access and MS Excel to test and evaluate the effectiveness of the data entry, compilation and analysis process. The completed manuscripts will be saved for possible future publication as "The Unpublished Ruffed Grouse Research Works of Dr. Gordon Gullion".

Student interns from Central Lakes College will be hired for data entry and data analysis tasks. Approximately one-third or around 20,000 data cards will be entered and analyzed over the course of two summer internship periods. The complete data record set of over 69,000 cards represents trapping records, observation records, drumming log usage data, drumming log ecological data, individual bird records, band code data, feeding records, aspen bud production data, radio telemetry records and other miscellaneous data, The digital data will then be stored on computer hardware and will be available to natural resource management professionals upon request. Possible hosts of the electronic data may be the Minnesota Department of Natural Resources Forest Wildlife Research Team at Grand Rapids and/or at the University of Minnesota.

Activity 1: Preserve Data by Converting to Electronic Format; Phase 1 **Budget: $37,547**

Preserve up to 20,000 data records currently stored on deteriorating hard copy field forms by converting these data to an electronic Master Data File. Four student interns at Central Lakes College will be employed over two

summer periods to enter the data into an MS Access format designed to mimic the data card format. These records will be searchable by word, phrase, date, and numeric content.

Outcome	Completion Date
1. Archival of Electronic MS Access Data Records; Phase 1	Sept. 1, 2016

Activity 2: Simplify Data Retrieval to Facilitate Use **Budget: $17,750**

Establish subsets of the Master Data File based on ecological, spatial and temporal attributes (e.g. cause of mortality, location, month-year, etc.). Establish companion subset keys to enable future users to easily and efficiently navigate and retrieve data relevant for the specific analytical task. A conversion key will need to be developed that automatically converts the grid data used to record observation and trapping records to latitude-longitude coordinates. A data conversion routine would be developed to accomplish this whereby specific grid coordinates would be automatically converted and recorded in lat-long data fields in the Access form. Previously mapped locations of drumming logs, trap sites and other fixed location sites have previously been mapped as part of another project and these data would be automatically entered when a fixed feature location was referenced. Two student interns would be selected to work on this task.

Outcome	Completion Date
1. Data Subsets and Data Retrieval Processes	Jan. 31, 2017

Activity 3: Analysis of Entered Data and Evaluation **Budget: $10,690**

Examine the uncompleted manuscripts and select a small sample of those that could be completed to test the effectiveness of the data retrieval and analysis process and potential using MS Access and Excel as data management and analysis tools. Other compatible analytical packages may also be considered if shown to be more effective in the analysis process. One to two student interns would be selected to work on this task

Outcome	Completion Date
1. Project Report Describing Activities, Results and Recommendations	June 30, 2017

III. PROJECT STRATEGY

A. Project Team/Partners

Kent Montgomery, Project Leader, will serve as the primary academic contact for the project as well as providing research oversight leadership and student mentoring. His experience as a field researcher and educator will provide valuable mentoring guidance to the students assigned to the project.

Franklin Svoboda's, Project Manager, past association of over 9 years with Dr. Gullion and the ruffed grouse research project will be of essential value in the data entry and recovery process. His familiarity with the structure of the data cards, the analysis methods applied in extracting data from the edge-punched cards and the field research standard operating procedures will be invaluable in the data recovery process. Frank will coordinate and supervise the development of the Access Data File and related data subsets and companion subset keys. Frank's experience as Dr. Gullion's ruffed grouse research assistant from 1963 to 1973 will be invaluable to ensure the successful completion of this project.

B. Project Impact and Long-Term Strategy

Phase 1: July 1, 2015 to June 30, 2017

C. Timeline Requirements

A significant potential application for these data is the potential completion of over 50 unpublished manuscripts and Dr. Gullion's personal life's work manuscript pertaining to his research of ruffed grouse over a 3 decade period. A second phase of the project would be to complete the entry of the remaining 35,000 data records and publication of the unpublished manuscripts and the book. Data would also be made available from an electronic data repository managed by either the Minnesota Department of Natural Resources or the University of Minnesota.

2015 Detailed Project Budget

Project Title: *Enhancing Future Forest Conservation Using Gullion's Historic Research*

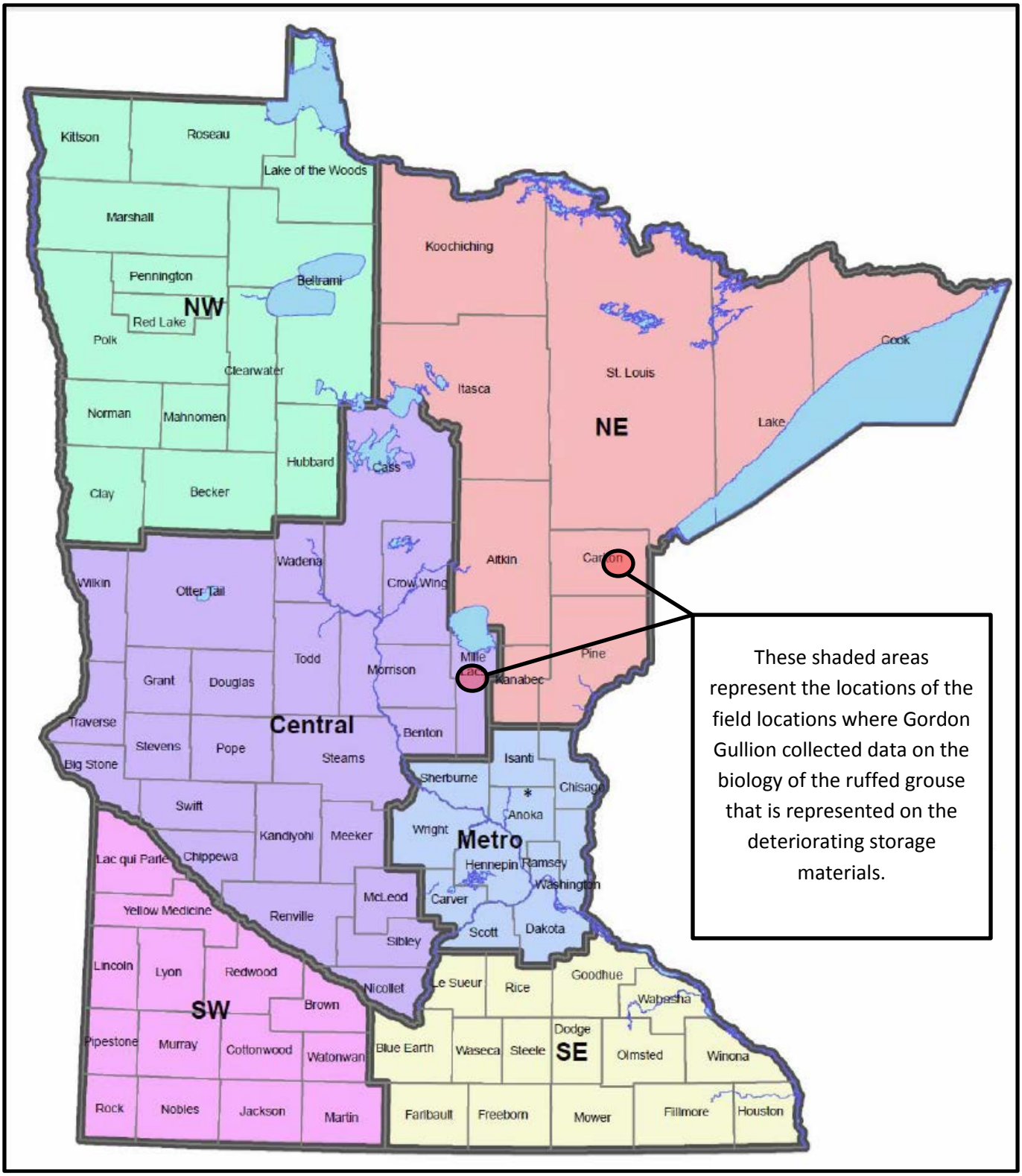
IV. TOTAL ENRTF REQUEST BUDGET *[Insert # of years for project]* **years**

BUDGET ITEM *(See "Guidance on Allowable Expenses", p. 13)*	**AMOUNT**
Personnel:	$ -
Student Interns (6.4 over 2 years x $7,000 = $44,500)	$44,500
Kent Montgomery, Project Manager (80% salary, 20% benefits); 5% FTE for 2 years	$5,607
Contract:	
Frank Svoboda 2 years	$12,500
Travel:	$ -
Mileage Brainerd 30 trips @ 200 mi/trip ($0.50/mi)	$3,000
Cloquet 2 trips @ 380 mi/trip ($0.50)/mi)	$380
Additional Budget Items:	
Institutional Cost Recovery (15%)	$9,898
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$75,885

V. OTHER FUNDS *(This entire section must be filled out. Do not delete rows. Indicate "N/A" if row is not applicable.)*

SOURCE OF FUNDS	**AMOUNT**	**Status**
Other Non-State $ To Be Applied To Project During Project Period:	NA	
Other State $ To Be Applied To Project During Project Period:	NA	
In-kind Services To Be Applied To Project During Project Period:	NA	
Funding History:	NA	
Remaining $ From Current ENRTF Appropriation:	NA	

Field locations of sites where Gordon Gullion conducted his historic ruffed grouse research.



Project Manager Qualifications

Franklin Svoboda's, Project Manager, past association of over 9 years with Dr. Gullion and the ruffed grouse research project will be of essential value in the data entry and recovery process. His familiarity with the structure of the data cards, the analysis methods applied in extracting data from the edge-punched cards and the field research standard operating procedures will be invaluable in the data recovery process. Frank will coordinate and supervise the development of the Access Data File and related data subsets and companion subset keys. Frank's experience as Dr. Gullion's ruffed grouse research assistant from 1963 to 1973 will be invaluable to ensure the successful completion of this project.

Kent Montgomery, Natural Resources Instructor at Central Lakes College (CLC), will serve as the project leader. Mr. Montgomery has managed several smaller Department of Defense grants while at CLC, including supervision of student workers, budget allocation and tracking, and grant reporting. Previously Mr. Montgomery has also administered numerous private, state, and Federal grants while at the University of Minnesota Extension Service and the Natural Resources Research Institute at the University of Minnesota Duluth.

Mr. Montgomery has over thirty years of experience in ecological monitoring and research, laboratory analysis, and remote sensing applied in wildlife management, forest management, and water resources contexts. He holds a B.A. in Education and Zoology from the University of Montana and an M. S. in Biology from the University of Minnesota, Duluth, as well as minors in Geology and Statistics. Mr. Montgomery currently teaches a variety of courses in the natural resources curriculum at CLC.

Organization Description

Central Lakes College is a regional facility, with campuses at Brainerd and Staples, is a member of the Minnesota State College and University System (MNSCU). During the 2011-12 academic year 6,252 students enrolled at Central Lakes College, including both the liberal arts and career/technical areas of study. Among the programs of study offered is a Natural Resources Technology A.A.S. degree, with approximately 40 students enrolled in the program annually. The majority of these students continue their natural resources training at a four-year institution. The Natural Resource program currently has transfer agreements with the Bemidji State University, the University of Minnesota, Crookston, and the University of Wisconsin, Stevens Point. Approximately 65% of students attending Central Lakes College receive some form of financial aid.