July 1, 1993

LCMR Final Status Report

I. Data Base for Plants of Minnesota - Wildlife 18

Program Manager: Anita F. Cholewa, Curator & Coordinator
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A. M.L. 91 Ch. 254, Art. 1, Sec. 14, Subd. 9(e) Appropriation: $130,000
Balance: $ 0

Data Base for Minnesota Plants: This appropriation is from the Minnesota environment and natural resources trust fund to the University of Minnesota to computerize the data base for Minnesota plants, including distribution, ecology, history, and management of each species.

B. Compatible Data: During the biennium ending June 30, 1993, the data collected by this project will conform to information architecture as defined in guidelines and standards adopted by the Information Policy Office. In addition, the data will be provided to and integrated with the Minnesota Land Management Center's Geographic Data Bases with the integration costs borne by the activity receiving funding.

C. Match Required: (not applicable)

II. Narrative

There are approximately 2,000 species of plants that grow wild in Minnesota. Collectively, they constitute the vegetation of Minnesota, and are managed for forestry, agriculture, wildlife, and recreation. The primary source of scientific data for these plants are botanical specimens collected by field biologists. Since 1890 the University of Minnesota Herbarium has been the official state-wide

repository for all botanical specimens. The Herbarium holdings currently number approximately 110,000 specimens, and are increasing at a rate of nearly 4,000 specimens per year. This represents a tremendous amount of unique ecological data. With the increasing emphasis of biological diversity in natural resource management, it is becoming imperative to integrate these data into ongoing inventory and management efforts of the DNR. However, the data are not currently computerized and are therefore largely inaccessible for many important uses. Computerization will allow rapid access to these data by the public and private agencies.

III. Objective

A. Data-base design

A.1 Narrative: Design a flexible and versatile computerized data base for all primary botanical data (i.e. biological, ecological, geographic, and management) housed in the University of Minnesota Herbarium.

A.2 Procedures: Select format for data entry, evaluate various available computer software data management programs, select the most appropriate software, and write the necessary programs for data entry. Evaluate, select and purchase best available computer hardware to execute the data base programs. Write documentation in the form of a user manual.

A.3 Budget

Amount Budgeted: $20,000
Balance: 0

A.4 Timeline for Products/Tasks

	July91	Jan92	June92	Jan93	June93
Establish data base design	*****				
Purchase hardware & software	******				
Review draft of user manual	**********				
Final draft of user manual	**********	**********	**********	**********	**********

1991-96

A.5 Status:

Data format was designed to address the needs of all potential users. The database software and design is such that the data can be downloaded into a user's file and easily converted/incorporated in other standard software. This will give users flexibility in their use of these data. Query menus were created and tested and a user manual written. Even though the database is not complete, passwords and accounts are now available for remote access to currently entered data.

A.6 Benefits: A computer system will be in place for the rapid entry and retrieval of all specimen-related botanical data.

B. Data base implementation

B.1 Narrative: Enter at least 2/3 of all specimen-related botanical data on deposit in the MN collection at the University of Minnesota Herbarium. This includes data on biology, ecology, geography, management and history that accompanies each specimen (currently estimate at 110,000).

B.2 Procedures: Two data entry technicians will enter and proof all specimen-related data into the data base. Student assistants will help verify data.

B.3 Budget

Amount Budgeted: $105,000
Balance: 0

B.4 Timeline for Products/Tasks

	July91	Jan92	June92	Jan93	June93
Enter all specimen-data	**********	**********			
Proof all data in data base		**********	**********		

B.5 Status: The equivalent of two full time data entry people were hired; 1 and 1/2 positions were added to help with data proofing and entry and editing.

Data entry is continuing with approximately 85,000 specimens entered to date; with proofing of data occurring periodically. Initial delays in acquiring software and the consequent delays in hiring data entry people will require an extension of the completion date. The U of M has provided funds to cover the extension of data entry/editing. The Herbarium is committed to maintaining the database with the addition of data as new specimens are added to the Herbarium's collection. Corrections and updating of data will also continue as necessary. User fees will be collected to help defray costs.

B.6 Benefits: The completion of the computerization will allow all users to enjoy rapid access to the entire range of botanical data on deposit at the University of Minnesota Herbarium.

C. Summary Analysis

C.1 Narrative: Perform an analysis of the distribution and abundance of each plant species that grows wild in Minnesota. These will include, but are not limited to, check lists of plant species known from each county, state-wide distribution maps for each species, and estimates of the abundance of each species throughout the State.

C.2 Procedures: A summary analysis will be performed on the computer and a report of this analysis written.

C.3 Budget

Amount Budgeted: $5,000
Balance: 0

C.4 Timeline for Products/Tasks

	July91	Jan92	June92	Jan93	June93
Perform summary analysis					**
Write report					***

C.5 Status: Searches and summaries of entered data have been tried and adjustments have been made to make them more efficient. Menus have been programmed to provide easy access to common queries. Software to create distribution maps has been purchased and installed and maps are now available for each taxon currently in the database.

C.6 Benefits: The summary analysis will serve as an example of the capabilities of the data base, and provide a general reference for the flora of Minnesota.

IV. Evaluation:

For the FY92-93 biennium, the program can be evaluated by its ability to: 1) produce computerized reports on the vegetation of Minnesota, and 2) make the data base and reports from the data base available to the public.

V. Context

A. Minnesota County Biological Survey (CBS) of the DNR is currently inventorying the biological diversity of Minnesota on a county-by-county basis. As such, they are a major contributor/user of the herbarium. Computerization of the herbarium specimens would greatly facilitate their inventory efforts and enhance their ability to analyze and summarize their results.

The scope of exotic species control in the DNR includes all non-native plant species that grow wild in Minnesota (estimated at 400 species). This includes purple loose-strife and Eurasian water-milfoil. The University of Minnesota herbarium has data on approximately 33,000 occurrences (locations of wild populations) of these non-native species. These data, when computerized, will serve as the initial data source for the location of these potentially harmful plants.

The Minnesota Department of Transportation (MNDOT) is responsible for numerous restoration and reseeding projects statewide. They have recently established a policy favoring native species over non-native

species in many of their plantings. As a result, they have an ongoing need to determine which plant species are native to each part of the State and what their habitat preferences are. MNDOT has identified the University of Minnesota Herbarium as their primary source for this information. Their access to the data will be greatly enhanced by this computerization project.

B. Not applicable.

C. Not applicable.

D. Not applicable.

E. Biennial Budget System Program Title and Budget: Not available at this time.

VI. Qualifications

1. Program Manager:

Dr. Anita F. Cholewa
Curator & Coordinator, Herbarium
University of Minnesota

Ph.D. Botany, University of Idaho, 1983
M.S. Forestry, University of Idaho, 1977

Dr. Cholewa's interests and expertise are in floristic and taxonomic botany. She has authored over 10 scientific publications in taxonomic botany. She has an extensive knowledge of the flora of Minnesota and teaches the Minnesota Plant Life laboratory and field trips and the Herbarium Curation class at the University of Minnesota. In her role as Herbarium Curator, she interacts frequently with many State and private organizations including the DNR, The Nature Conservancy, and U.S. Forest Service. She was a member of Lt. Gov. Marlene Johnson's

Wildflower Task Force and the MN Dept. of Agric.'s Exotic Species Task Force.

2. Major Cooperators:

Welby R. Smith
Botanist, Natural Heritage Program
Section of Wildlife
Minnesota Department of Natural Resources

M.S. Botany, St. Cloud State University, 1974

Mr. Smith's interests and expertise are in floristic botany, primarily the flora of Minnesota. During his 15 years of botanical research, he has collected over 20,000 specimens of Minnesota plants, and is considered the leading authority on Minnesota plant life. His role as DNR botanist includes acting as endangered plant species liaison to the U.S. Department of the Interior and participating in the environmental review process.

VII. Reporting Requirements

Semiannual reports will be submitted not later than January 1, 1992, July 1, 1992, January 1, 1993 and a final status report by June 30, 1993.

1991 RESEARCH PROJECT ABSTRACT
FOR THE PERIOD ENDING JUNE 30, 1993
This project was supported by MN Environment and Natural Resources Trust Fund

TITLE:	Data Base for Plants of Minnesota
PROGRAM MANAGER:	Dr. Anita F. Cholewa
ORGANIZATION:	University of Minnesota
LEGAL CITATION:	M.L. 91, Ch. 254, Art. 1, Sec. 14, Subd. 9(e)

STATEMENT OF OBJECTIVES:

Approximately 2,000 species of higher plants grow wild in Minnesota. To provide scientific data regarding these plants to researchers, natural resource managers, field biologists, and state and federal agencies, a computerized database was needed that would allow access to information stored with the botanical specimens housed in the University of Minnesota Herbarium.

OVERALL PROJECT RESULTS:

Using commercial software, a relational database was created to provide easier access to biological data associated with plant specimens collected in Minnesota. The stored information includes data on species' name, locality, preserve or state park name (if applicable), nearby town, township and range, latitude and longitude (if available), other locality data, habitat, collector and collection date. Menu driven user queries can generate checklists for parks, preserves, counties, township and ranges, or lists of counties in which a particular species occurs. The database can also provide complete locality or habitat information for specific species. Tailored queries are also possible and can generate lists based on collector, or date of collection, habitat key words or other combinations. The database has also been linked to a mapping program so that current statewide distribution maps can be created. Network connections allow for remote access by users.

PROJECT RESULTS USE AND DISSEMINATION

The MN DNR Natural Heritage Program has been informed of the progress of this project and a user account has been established so Heritage Personnel can access the database in conjunction with their work on rare plants and the County Biological Survey. The MN DOT has also been notified of the availability of these data for use in their work with roadside plantings of native plants. Notification will also be made to DNR Regional Resource Managers, The Nature Conservancy-MN Chapter; Chippewa and Superior national forests. The project was described in the MN State Lottery's Environmental Journal and briefly aired as a short radio segment. Public requests for plant distribution information will also be answered partly through the use of the database. A report will also be made to "Herbarium News," a newsletter serving the national botanical community.