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1985

### Wildlife Database Management for New York Ecosystems

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Bayer, Mary and Underwood, H. Brian, "Wildlife Database Management for New York Ecosystems" (1985). *Adirondack Wildlife Research Project Reports Funded by the Pittman-Robertson Act*. 26. <https://digitalcommons.esf.edu/awrpr/26>

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State: New York  
Project No: W-105-R

Project Title: Wildlife Ecology, Behavior and Habitat Improvement  
in New York

Study Number and Title: XIV - Wildlife Database Management for New York  
Ecosystems

Study Objective: Develop a computerized indexing system for sorting and  
accessing data records and develop descriptive summaries  
of existing data files.

Job Number and Title: XIV-1 - Development of a Computerized Database for  
All Records Pertaining to Selected Wildlife Species.

Job Objective: Develop a database management system and input records of  
all theses and P-R reports pertaining to work conducted  
under the P-R program at the Huntington Wildlife Forest.

Period Covered: April 1, 1984 - March 31, 1985

Abstract: The Huntington Wildlife Forest (HWF) of the State University of  
New York, College of Environmental Science and Forestry, has served as a  
research station for the biology and management of wildlife species and  
their habitats for the past 50 years. Approximately 25 percent of this  
research has been funded by the New York State Department of Environmental  
Conservation, Bureau of Wildlife (PR Project W-105-R). The data collected  
have extensive potential applications, which are enhanced by increased  
accessibility. These data provided from past research activities are  
collectively referred to as the "Database". This Database is organized  
into "Data Files". The computerized "Database System", serves as an  
efficient tool for accessing Data Files that meet user specified criteria.  
The Data Files are classified by various criteria which provide  
information about the particular file. These criteria include file type,  
subject, taxa, study areas, investigators, dates of study and key words.  
Following completion of the search, the system responds with a one page  
summary of the Data File, and information specifying access procedures to  
the thesis or report. The Database System is functional on an IBM-PCXT.  
The program is "user-friendly" and allows searching, creating, and editing  
Data Files.

Background: The New York State program for management of wildlife in the northern region is designed to provide maximum recreational use in a manner that is consistent with long-term ecological stability and social constraints. The program recognizes the need for alternative approaches to management in various parts of this region, and the need for broad governmental/public support.

The management program acknowledges that rigorous management in the northern region is difficult. This difficulty arises because the ecosystems in this region are less predictable and more difficult to manipulate than those where classical management has been practiced. Further, effective management is built on an understanding of the biology of wildlife species and, in this region, our knowledge is incomplete. Nevertheless, it appears, that properly synthesized, the information currently available could provide the basis for developing basic management programs. Further, such synthesis of information would help identify key areas where future research should be focused. With refinement of our understanding of the biology of the key species in this region, management programs specifically tailored to various portions of the region could be designed. Ultimately, multiple species management on selected areas should be possible.

Because of the extensive investigations of wildlife conducted by the College of Environmental Sciences and Forestry in the Adirondack region, and because of the College's facilities and expertise at the Adirondack Ecological Center, this institution is in an excellent position to aid the Bureau of Wildlife. The existing data are of exceptional value and this project is envisioned as an opportunity to synthesize these data in support of broader Bureau programs.

Results: A data-base indexing system was developed for use on an IBM PCXT micro-computer. Summaries of all theses and PR reports were loaded into the system. An informational meeting was held with Bureau personnel during the project to allow input. A user manual was developed and the software, data summaries and IBM PCXT machine were delivered to the Delmar Wildlife Research Center. (See Appendix I)

Recommendations: This Study should be continued to allow development of other, more flexible data-base management software to meet Bureau needs and to allow summarization of data sets on file at the Adirondack Ecological Center that would be of value to the Bureau, but which are not included in theses or reports.

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USER'S GUIDE TO THE  
WILDLIFE DATABASE SYSTEM

## INTRODUCTION

The Huntington Wildlife Forest (HWF) of the State University of New York, College of Environmental Science and Forestry, has served as a research station for the biology and management of wildlife species and their habitats for the past 50 years. Approximately 25 percent of this research has been funded by the New York State Department of Environmental Conservation, Bureau of Wildlife (PR Project W-105-R). The data collected have extensive potential applications, which are enhanced by increased accessibility.

These data provided from past research activities are collectively referred to as the "Database". This Database is organized into descriptive "Data Files". Each Data File is a composite of information pertaining to a research activity. The computerized "Database System", described in the following pages, serves as an efficient tool for accessing Data Files that meet user specified criteria.

The Data Files are classified by various criteria which provide information about the particular file. Seven of these criteria have coded categories associated with them. Values for these criteria are specified by the user and serve as the basis for the Database System. The remaining criteria are uncoded and serve to convey general information about the Data File to the user. A listing of criteria and appropriate descriptions is presented in Table 1.

The Database System (from hereon, referred to as the "System") is functional on an IBM-PC XT and is programmed utilizing the language APL\*PLUS. The program is "user-friendly"; all information required for searching, creating, and editing Data Files is requested from the user and simple instructions accompany each request. Incorrect responses to a request are

identified and the request is repeated until an appropriate response is input.

### ONLINE OPERATION

The instructions for accessing the Database System are as follows:

1. Turn the IBM-PC on. If a printer is connected, it must also be turned on and the ON LINE key on the printer should appear green. If it does not, press the ON LINE key once.

2. After a short time period, a request for the current date appears. Type in the appropriate response and hit the ENTER key.

(e.g. 1-13-85)

3. A request for the current time appears next. Type in the appropriate response and hit the ENTER key (e.g. 1:30).

4. The Database workspace is loaded by inputting the command:

```
)LOAD DATABASE
```

Before proceeding with information about the System, a brief review of the APL\*PLUS keyboard is important. Table 2 contains a list of the important keys and their functions.

After loading the System workspace, the user is presented with

4 options:

1. GET A DESCRIPTION OF THE DATABASE SYSTEM
2. SEARCH THE DATABASE
3. EDIT THE DATABASE
4. QUIT

#### DATABASE SYSTEM REVIEW

Selection of Option 1 presents the user with a brief summary of the System, criteria available, their associated categories and code numbers. If the user is not familiar with the System, it is advantageous to review this information and to obtain a hardcopy if a printer is available.

#### SEARCHING THE DATABASE

Selection of Option 2 begins the Search procedure. Before proceeding, an understanding of the Search procedure is essential for efficient use of the System. The System is based upon a comparison between the coded criteria information contained within a Data File and the user specified criteria categories. When a user specifies a category within a criterion, the System utilizes a logical "or" to search the Database. For example, the user specifies the categories "fisheries" and "forestry" for the File Subject criterion. The System searches for Data Files having either a file subject "fisheries" or "forestry", or both. The Data Files that are associated with these File Subject categories are then compiled into a new "Database". When the user specifies another criterion, the System searches this reduced



Database for the designated categories.

Inputting a 2 in response to the prompt begins the Search. A list of possible criteria appears on the screen. These criteria are:

1 = FILE TYPE	5 = INVESTIGATORS
2 = FILE SUBJECT	6 = DATA DATES
3 = FILE TAXA	7 = KEY WORDS
4 = STUDY AREAS	

Following criterion selection, the System displays a menu of categories and code numbers associated with the selected criterion. A prompt is then issued, and the user must input the code numbers corresponding to the desired categories. More than 1 category is permitted to be input, however a space must separate different values. Code numbers do not need to be input in any specific order. An exception to criteria having coded categories is the Data Dates criterion. The user simply inputs the correct dates or date (a 4 number sequence such as "1984") in response to the prompt.

When utilizing the Search procedure, it is important to keep certain concepts in mind. First, because of the programming techniques utilized, the criteria that undergo the fastest search are the File Type and Data Dates. Therefore, if the user has knowledge of this information, a reduced Database is obtained more quickly if either or both of these criteria are specified prior to other criteria selection. Consequently, time spent at the terminal is reduced. Once a criterion is specified, it cannot be re-searched during that terminal session. Therefore, it is essential for the user to designate all desired categories within a criterion when that information is requested.

After the user inputs the coded categories for a criterion, the Search

for Data Files containing the specified categories begins. Depending upon the number of Data Files within the Database and the criterion specified, there is a relatively short waiting period during which the Search progresses.

Following completion of the Search, the System responds by displaying the criterion most recently specified, all previously specified criteria, and the number of Data Files that meet all designated categories associated with these criteria. The user is then given the following options:

1. SPECIFY ANOTHER CRITERION
2. END THIS SEARCH AND GET FILE DESCRIPTIONS OR QUIT

If Option 1 is selected, the System displays all criteria that have been previously selected and then presents the original criteria menu. Once a criterion is searched, it cannot be re-specified during that terminal session. If a criterion is selected that has been previously searched, the System indicates the error and requests for the user to specify another criterion.

After all desired criteria are selected and the Search is completed, the user must select the Option 2. This ends the Search and permits the user to either get Data File descriptions or quit. The following options are then presented.

1. GET A DESCRIPTION OF THE FILES YOU JUST FOUND
2. DO ANOTHER SEARCH
3. QUIT

The choices are basically self-explanatory, however a review of them is appropriate. If Option 1 is selected, the File Numbers corresponding to the Data Files that meet all specified criteria are listed. The user is then offered the choice of reviewing all these Data Files or selecting a portion of this list. Once the files are selected for review, the user is given the opportunity to review file descriptions on the screen or receive a hardcopy if a printer is attached. Once selected, there is a short time period before a file description appears on the screen. When obtaining a hardcopy, one Data File is printed per page. Therefore, the user should align the paper at line 1 prior to having the Data File printed.

After all designated file descriptions are reviewed, the user is asked if more file descriptions are desired. If "YES", the System requests the numbers of those files. A response of "NO" results in the loss of Data Files previously found and the System responds by displaying the original option menu:

1. GET A DESCRIPTION OF THE DATABASE SYSTEM
2. SEARCH THE DATABASE
3. EDIT THE DATABASE
4. QUIT

Selection of Option 2 initiates another Search. Inputting a 3 in response to the prompt enables the user to begin the Editing procedure. Selection of Option 4 terminates the execution of the System. However, the DATABASE workspace is still loaded. If the user wants to utilize the System

again, the following command must be issued:

MASTER

### EDITING THE DATABASE

Selection of Option 3 loads the DATAEDIT workspace. The interactive Editing program is also "user-friendly" and it is designed so that the creation of new Data Files or the editing of old Data Files is relatively simple. As in the Search procedure, information is requested from the user and incorrect responses are identified. A sample Data File is presented in Figure 1.

After the DATAEDIT workspace is loaded, the following message appears:

note: SYSTEM CONTROL HAS BEEN TRANSFERRED TO THE DATABASE  
EDITOR WORKSPACE

The user is then given the following options:

1. EDIT EXISTING FILE DESCRIPTIONS
2. ADD NEW FILE DESCRIPTIONS
3. QUIT EDITING

## Editing Data Files

If the user chooses to edit existing Data File descriptions, Option 1 is selected. The System responds by prompting for the File Number that the user wishes to edit. If the Data File does not exist, an error message appears. If the Data File does exist, the System responds by asking the user if a review of the file description is desired. A "YES" or "NO" is an acceptable response.

The user is then asked to identify the information that must be changed. The following menu appears:

- 1 = FILE NAME
- 2 = CODED INFORMATION
- 3 = DESCRIPTIVE SUMMARY
- 4 = PHYSICAL LOCATION
- 5 = PHYSICAL FORM

Only one option may be selected at a time. However, the Editing procedure returns to this menu if the user desires to make more changes. If more than 1 number is input, an error message appears and the user is asked to try again. According to the Option selected, appropriate requests by the Editing procedure appear on the screen.

If coded information is to be changed, the user inputs a 2 in response to the prompt. The user is then asked what coded information is to be edited and a list of criteria and associated code numbers are presented. In response to an appropriate numerical input, the System requests for the user to input the criterion information. If errors are present in the category

codes or dates that are input, the System indicates this and requests for the user to input the correct information. Only 1 criterion can be edited at one time. However, the user is given the opportunity to make additional changes in coded criteria if the need arises.

If the File Name, Physical Location, or Physical Form are criteria that need to be altered, the user must input the appropriate numerical code in response to the prompt (i.e. a 1, 4, or 5, respectively). Upon receiving the information, the System responds by issuing a command for the user to input either a File Name, Physical Location, or Physical Form, depending upon the user's request.

If changes are to be made to the Descriptive Summary, the Full-Screen Editor must be utilized. Because of the programming techniques utilized, the user must input the entire Descriptive Summary regardless of how much editing was required in the original version. A review of the Full-Screen Editor appears at the end of this manual. An unfamiliar user should refer to this prior to and during a Descriptive Summary input.

After all changes are made, the user has the option of reviewing the edited Data File. Following this, the user is given the opportunity to make additional changes to this Data File. If the response is a "YES", the user is asked to identify the information requiring modification. If the response is a "NO", the System responds by indicating that the revised Data File is saved. The user is then given the opportunity to edit another Data File. If the user chooses not to edit another Data File, an Option must be chosen from

the following editing menu:

1. EDIT EXISTING FILE DESCRIPTIONS
2. ADD NEW FILE DESCRIPTIONS
3. QUIT EDITING

#### Creating Data Files

If the user chooses to create a new Data File, Option 2 is selected. The procedure is very similar to that utilized for editing a Data File, however all the information contained within a Data File must be input by the user.

Immediately following the selection of Option 2, a message containing the File Number for the new Data File appears. For successful organization, this number should be recorded on the file description form from which the user is obtaining the information. The user is then asked to input appropriate information for the various criteria which comprise a Data File. Inappropriate responses, in terms of code numbers, are recognized by the System, and the user is required to input the corrected information. When inputting more than 1 category for a criterion, a space must separate different values.

When inputting the Descriptive Summary, the Full-Screen Editor is utilized. The information pertaining to the Full-Screen Editor is found at the end of this manual and should be reviewed prior to creating a new Data File.

After all information is correctly input, the user is given the opportunity to review the newly created Data File. An example Data File is

presented in Figure 1. If a printer is available, a hardcopy may be obtained. After reviewing the information, the user has the option of making changes in the Data File or saving the Data File as it is.

If the user desires to make changes in any or all of the Data File criteria, the System responds by listing the criteria and the code numbers associated with the various criteria. At this point, the user is basically "editing an existing Data File" and should refer to that section of the User's Manual.

After the user indicates that the newly created Data File is to be saved, a message appears that signifies the process is taking place. An example message is:

```
note:  APL DATA FILE DBF1 HAS BEEN
        FILLED AND DATA FILE DBF2 IS
        BEING CREATED.  A COPY OF FILE
        DBF1 SHOULD BE ARCHIVED TO
        PREVENT ACCIDENTAL LOSS OF
        THIS INFORMATION.
```

The "DATA FILE DBF1" is simply a coding procedure for the System and it represents a "package" of Data Files that have been stored together. This message indicates that the "package" is full and another "package" (DATA FILE DBF2) is being created. If a new Data File Package is not being created, this message will not appear. After a short time period, the following message appears:

```
note:  FILE 25 HAS BEEN SAVED.
```



The above is simply an example, however a message such as this indicates that the creation of a Data File has been successfully completed. After this message appears, the user is given the option of creating another Data File or returning to the original editing menu. If more Data Files are to be created, the user responds with a "YES" and the System responds with a message containing the File Number of the Data File that is to be created. If "NO", the user is presented with the following editing menu:

1. EDIT EXISTING FILE DESCRIPTIONS
2. ADD NEW FILE DESCRIPTIONS
3. QUIT EDITING

#### Quit Editing

Selection of Option 3 loads the DATABASE workspace and the user is presented with the main menu. A description of the options available is given in the section called "ONLINE OPERATION."

#### FULL-SCREEN EDITOR

When editing Data Files, the user has an opportunity to make changes in the Descriptive Summary of that file. When creating Data Files, the user is required to input a Descriptive Summary. In both cases, the Full-Screen Editor is utilized. It is a relatively simple process, however a brief review of the Editor is necessary. Important keys and their associated functions are found in Table 3.

After the System receives a command that a Descriptive Summary is to be either altered or created, the following message appears:

note: YOU WILL BE USING THE FULL-SCREEN EDITOR. HIT "ENTER"  
WHEN READY TO BEGIN AND "CONTROL E" WHEN FINISHED TYPING  
THE DESCRIPTION....

When the user is ready to begin typing the Descriptive Summary, the ENTER key must be pressed. A screen appears that has a [0] in the upper left hand corner. This is the first line of the Descriptive Summary. The user must begin to type in the information on this line. It is important for the user to remember that the Descriptive Summary appears in the Data File exactly as it appears on the editing screen, however empty lines at the end of the Descriptive Summary are removed. Therefore, if a word is split into 2 parts, it remains that way in the Data File. Because of the programming techniques utilized, it is imperative that the user never includes a "Δ" in the Descriptive Summary. Although not seen by the user, this symbol appears at the end of each Data File and serves as a convenient "sign" which enables the System to identify the beginning and end of a Data File. After creating or editing a Data File, the System automatically appends a "Δ" to the end of the file description, thereby ensuring its proper placement. After the user finishes inputting the Descriptive Summary, the CONTROL and E keys must be pressed simultaneously. This returns the user to the Editing program and completes the Descriptive Summary input.

Table 1. A listing of criteria and appropriate descriptions associated with the Database System.

---

<u>Criterion</u>	<u>Description</u>
File Number	assigned by the Database System according to order of input; not a classification criterion
File Name	descriptive title; should be unique; not a classification criterion
File Type	delineates type of information Data File contains; only 1 File Type per Data File
File Subject	gives general subject category/categories with which Data File deals
File Taxa	gives taxonomic classification of plants or animals associated with Data File; not always applicable
Study Areas	delineates geographic location associated with Data File
Investigators	first letters of last names of person/people associated with Data File
Data Dates	specifies first and last years associated with Data File
Key Words	similar to File Subject, but more specific categories
Descriptive Summary	brief summary of information in Data File; not a classification criterion
Physical Location of the File	informs user about accessing information described by Data File; not a classification criterion
Physical Form of the File	informs user of the physical form of information described in Data File; not a classification criterion

Table 2. A listing of important keys and corresponding functions necessary for utilizing the Database System.

<u>Key</u>	<u>Function</u>
ENTER	inputs information to System
SHIFT	changes meaning of key to green symbol on key (e.g. SHIFT A = "α")
ALT	changes meaning of key to red symbol on key or lower case letters (e.g. ALT A = "a")
UNTYPE	deletes character immediately before cursor
DEL	deletes character at cursor
Scroll ↑	scrolls material on screen up 1 line; beeps if no more lines are in memory
Scroll ↓	scrolls material on screen down 1 line; beeps if no more lines in memory
CTRL S	stops printing on screen; does not stop program execution
CTRL Q	initiates printing on screen after CTRL S

Table 3. A listing of important keys and corresponding functions necessary for utilizing the Full-Screen Editor.

<u>Keys</u>	<u>Function</u>
Ctrl B	breaks the line into 2 lines at the cursor
Ctrl E	ends editing with the Full-Screen Editor
Ctrl G	joins the following line to the end of the line marked by the cursor
ENTER	within text, moves cursor to next line
Up Arrow	moves cursor up 1 line
Down Arrow	moves cursor down 1 line