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COOPERATIVE PARK STUDIES UNIT

UNIVERSITY OF IDAHO



University of Idaho
College of Forestry,
Wildlife and Range Sciences
Moscow, Idaho 83843



NOTE: THIS DATABASE IS NO
LONGER IN USE. 10/91

THE CRATERS OF THE MOON NATIONAL MONUMENT
WILDLIFE DATABASE

Operating manual

Roger A. Hoffman
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THE CRATERS OF THE MOON NATIONAL MONUMENT
WILDLIFE DATABASE
OPERATING MANUAL

INTRODUCTION

The Craters of the Moon (CRMO) wildlife database was designed to provide a convenient yet powerful method to store and retrieve wildlife data. The system was designed to be used by resource managers and other park personnel with limited computer experience. Information stored consists of: the name and number of the species observed, date and location of observation (including habitat type), name of observer, breeding status (for birds) and comments. Information in the database can be recalled and displayed in various ways. Individual species' distribution maps and specialized maps for more precise locations (such as raptor nests) can be produced on screen or printed. Graphical representations of seasonal distributions of each species can also be produced. Species lists can be generated for each habitat type, month, or combination of these conditions.

The system is written in dBASE III+ with mapping and graphing modules written in Turbo Pascal and executed from within dBASE. The code is not compiled so that changes can be made by future users.

The purpose of this report is to provide a complete overview of how the wildlife database fits within the structure of the computer operating system and it provides detailed instructions on how to use the wildlife database. This overview starts with a discussion of the Disk Operating System (DOS) which provides the framework for all computer operations.

A REVIEW OF DOS

Dos is the link between the user and the computer. It is the software that provides all the basic functions necessary to operate the hardware that makes up the computer system. Instead of each software package recreating the

wheel when it comes to the basic operations of the display, disk drives and printer, Dos takes care of all this while the other software can be tailored to the more specific applications such as word-processing or database management.

A major function of Dos is to organize and manage computer files, disk files, program files and data files. All of these files consist of collections of information stored on a magnetic media such as a floppy disk or a hard disk. Understanding the manner in which these files are organized and used is important to becoming proficient at operating the computer system.

Most microcomputers now include a fixed (also know as a hard) disk for the storage of files. This type of disk, unlike the smaller, removable diskette, is permanently in place in the computer. Because of the large volume of information a fixed disk can store, it is important that it be organized in a systematic manner.

In an office, information is stored in paper files which are organized in some systematic way in a file cabinet so that it can be easily retrieved. The information in a computer is organized in much the same manner. The information, whether it is in the form of a program or collections of data such as wordprocessing documents or databases, is stored in files. If a file is stored on a diskette, it is not too difficult to locate because a diskette holds a limited amount of files (one 5.25" 360K diskette will hold about 480 double-spaced typewritten pages of information). However locating a specific file stored on a hard disk can be much more difficult because hard disks hold so much more information (a 20 megabyte hard disk will hold about 14,000 double-spaced typewritten pages of information). Hard disks that hold three or four times that amount are common. Therefore an efficient system is

required to organize the storage of files on a computer system with a hard disk.

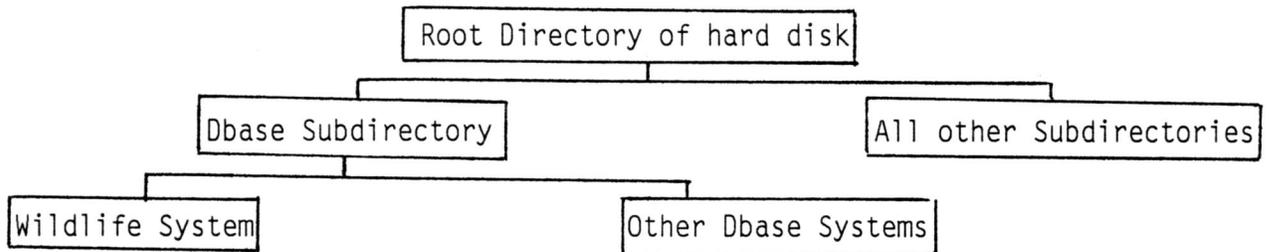
One method is to place related files together in what is called a subdirectory. This is analogous to setting aside a drawer in the file cabinet for one topic of paper files. For example one can create a subdirectory for wordprocessing files, one for database files and one for spreadsheets. Then within each drawer or subdirectory, dividers can be placed to further subdivide the individual files. For example, if the files in the database drawer were numerous, it might be advantageous to separate one type of database from another. For example the files concerned with the wildlife database would all be together and those files holding information on the case incident reports would be in a separate section of the database drawer.

Each computer file is identified by a name consisting of up to eight characters and a three character extension. The extension is used to identify the type of file. For example, files ending in .exe or .com are compiled files which will execute a program simply by typing the file name without the extension (the part preceding the '.') (see appendix A for more examples).

GENERAL SETUP OF THE CRMO WILDLIFE DATABASE SYSTEM

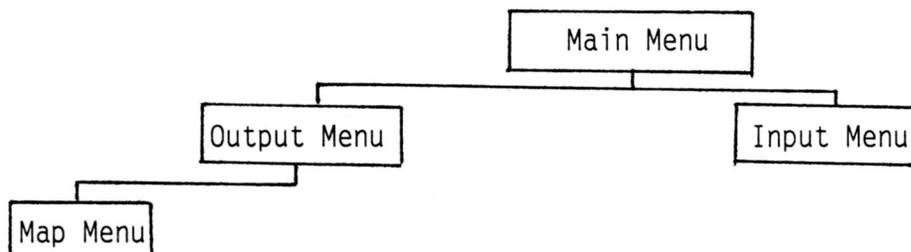
The wildlife database system is currently set up on the computer devoted to resource management at CRMO (an IBM PS II Model 50). The discussions below refer to that system, but are basically generic to all IBM systems. All files (both program files and data files) associated with the wildlife observation database system are stored in a subdirectory of the hard disk named wildlife (see figure below). Wildlife is under the subdirectory called dbase where all the dBASE system files are located. A batch file (a file containing a series of DOS commands) called wildlife.bat, located in the c:\util\bat subdirectory, enables the user to initiate the wildlife observation system from any dos

prompt simply by typing "wildlife" or selecting the wildlife observations options at the dos help menu. Path statements tell the computer where, if a file cannot be located in the current directory, to look for a file. They are included in the autoexec.bat file (the batch file that is automatically executed as soon as the computer is turned on). For this system a path statement includes the paths to c:\util\bat and c:\dbase and enables the computer to locate the necessary files from wherever the command (wildlife or 6), is given.



General organization of subdirectories on the CRMO Resource Management Computer.

The wildlife database system allows the user to select the task desired from a list of options displayed on the screen (referred to as a menu). There are three levels of menus. The main menu, the input and output menus and in the case of output, the mapping menu (see chart below).



General organization of the menus for the wildlife database system.

OPERATING INSTRUCTIONS

Once the database system is initiated (by typing WILDLIFE or 6 at the dos prompt on CRMO resource management computer), the following main menu is displayed.

```
CRATERS OF THE MOON NATIONAL MONUMENT WILDLIFE DATABASE
MAIN MENU
[I] INPUT/UPDATE ROUTINES
[O] OUTPUT/ANALYSIS ROUTINES
[B] BACKUP FILES
[Q] QUIT PROGRAM
```

Selecting "I" Option

The first choice (I) will bring up the input menu shown below. Choices are made by either entering the letter associated with your choice or by highlighting your choice with the cursor by pressing the up or down arrow keys then pressing enter to select that action.

```
CRATERS OF THE MOON NATIONAL MONUMENT WILDLIFE DATABASE
INPUT MENU
[A] ADD OBSERVATIONS TO TEMPORARY FILE
[U] UPDATE FILES FROM TEMPORARY FILE
[R] RETURN TO MAIN MENU
ENTER YOUR CHOICE
```

When the [A] option is selected, new observations can be entered on the entry screen shown below.

CRATERS OF THE MOON NATIONAL MONUMENT WILDLIFE DATABASE

OBSERVATION ENTRY ROUTINE						
DATE	__/__/__	OBS	_____			
SPP	#	UTME	UTMN	HT	C	S
_____	_____	_____	_____	_____	_____	_____
NOTES _____						

ENTER QUIT FOR SPECIES TO END SESSION

When entering observations, information is typed in each applicable field, pressing the enter key proceeds to the next field. If the information already in the field (as suggested by the computer) is relevant to the current record, simply pressing the enter key accepts that value. Otherwise, the user simply types the new information over the current information in the field. Pressing the PgDn key proceeds to the next record. It is easiest to enter observations from data forms with a format similar to the entry screen. An example is given below.

The four character space for species identification is for the four letter abbreviation for each species used throughout this system. The use of an abbreviation, while possibly not as clear as whole names, has many advantages. Keying in observations is faster with abbreviations particularly if done from field forms using abbreviations. The list of abbreviations and species names used in the database system is included in appendix B. For the most part, the abbreviations are obvious and become second nature, however there are a couple of conventions that need to be clarified. When a pair of abbreviations may be ambiguous, then novel abbreviations are selected for both species. For example, the abbreviations for savannah sparrow and sage sparrow

DATE 6 / 3 / 87 OBS. Horsman TECH. Census

WEATHER 33°C Clear 17 miles

SPP	#	UTME	UTMN	VT	HT	M	C	TIME	R	S	*
COFL	1	293	4813	22	22		V				1
LOSH	1	294	4813	22	22		V				
RSXO	1	293	4815	17	17	1	V	13 ²⁰	1		
BRSP	3						V				
NOHA	2						V				2
SATX	1						A				
WASP	1						V				
CLNU	1	292		2	2	1	V	14 ⁰⁰	2		
ROAN	2					2	A	14 ¹⁰			
LEWD	1	292	4814	1	1	1	V	14 ⁴⁰	2		
BRSP	1			1	1	2	V	14 ⁵⁰	2		
WETA	6	291	4814	24	24	1	A	15 ²⁵	1		
AMRO	2						V				3
BRBL	5						A				
HETH	1						V				
CHSP	3						A				
WAVI	1						V				
COFL	1						A				
DISI	2					2	V	15 ³⁵			
GTTO	1						A				
RCNU	1						A				
RESQ	1						A				
CLNU	1					3	A	15 ⁴⁵			
MUDE	1						V				
GRCA	1	292	4815	2	27	0	V	0			
RAWV	4			2	30		V				4

* 1) NEST w/ 4 EGGS (MAY 3 - 4)

2) NEST w/ 1 EGG

3) CAROLINA WOODPECKER TO NEST

4) FIRST EGG LAY (HR)

BRBL NESTS AT HR: 1 2 eggs
2 3 eggs
1 4 eggs

AM Robin first young hatched

Example data form for use with the Craters of the Moon National Monument Wildlife Database System.

would both be SASP. Since each abbreviation must be unique and non-ambiguous, example data form

SVSP is selected for savannah sparrow and SGSP for sage sparrow. Because each abbreviation must be four letters, the abbreviation for elk is ELKK (longer than the original).

The base map of CRMO has been overlaid with 1 km blocks referenced to the utm system¹. The utm fields refer to the utm coordinates of the lower left-hand corner of each 1 km block in which the observation occurred. The coordinates are reduced to kilometers in the database system for purposes of simplicity. For example, if the exact location is 297,865 m East and 4808,136 m North, the coordinates would be 297E and 4808N.

The habitat types (HT) are based on the numbers found on the vegetation map of Craters of the Moon National Monument. Six additional types are added to include distinct habitats (see Appendix C for complete list).

The code field 'C' refers to the type of observation; visual (V), audio (A), capture (C), track or other sign (T). The status field 'S' refers to the breeding status of the species (applicable to birds only); 1 for confirmed breeding, 2 for probable breeding, 3 for possible, and 4 for all other observations. The criteria for distinguishing confirmed, probable, and possible breeding comes from the standards of the breeding bird survey committee and is included in Appendix D. The specific criteria used to classify a record should be included in the notes field.

¹. Utm refers to the universal transverse mercator grid, a worldwide system used to locate points on the earth's surface. The utm grid is indicated on all recent USGS topographic maps. The grid system is based on a series of north - south zones extending around the world. Each zone covers 6° of longitude. In the northern hemisphere, a location is identified as the distance in meters east of a given zone boundary and by meters north of the equator. CRMO is in zone 12 with zone boundary the 114° longitude line.

The notes field should also be used for specific location of nests, group composition (male vs female, mature vs young) when classification is possible, unusual behavior or any other pertinent accessory information on the observation.

On entering the information for a observation, the complete name of the species for the abbreviation given will be shown in the lower box for verification. An unrecognized abbreviation will require the user to try again until an recognized abbreviation is given. As the message on the bottom of the observation entry screen shows, entering 'QUIT' in the species field will return the user to the input/update menu.

CRATERS OF THE MOON NATIONAL MONUMENT WILDLIFE DATABASE

INPUT MENU
[A] ADD OBSERVATIONS TO TEMPORARY FILE
[U] UPDATE FILES FROM TEMPORARY FILE
[R] RETURN TO MAIN MENU

ENTER YOUR CHOICE

When new observations are entered into the database system, they are stored in a temporary file until the update option is selected. This allows for new observations to be entered at different sessions before updating is performed by selecting the [U] option. For a large number of observations, this can take some time so the user is kept updated on the progress by screens as below.

During the last part of the updating routine, an indication of which file number is being processed of the total number of files (as demonstrated by the 'FILE NUMBER 25 OF 25' in the example below) gives the user a way of approximating how much time is required to finish the updates.

CRATERS OF THE MOON NATIONAL MONUMENT WILDLIFE DATABASE

DISTRIBUTION FILES UPDATE ROUTINE

UPDATING PRON (.DIS/.DTE FILES)

FILE NUMBER 25 OF 25

After the updates are completed, the input menu is redisplayed.

CRATERS OF THE MOON NATIONAL MONUMENT WILDLIFE DATABASE

INPUT MENU

[A] ADD OBSERVATIONS TO TEMPORARY FILE

[U] UPDATE FILES FROM TEMPORARY FILE

[R] RETURN TO MAIN MENU

ENTER YOUR CHOICE

By selecting the [R] option, the user is returned to the main menu.

CRATERS OF THE MOON NATIONAL MONUMENT WILDLIFE DATABASE

MAIN MENU

[I] INPUT/UPDATE ROUTINES

[O] OUTPUT/ANALYSIS ROUTINES

[B] BACKUP FILES

[Q] QUIT PROGRAM

Selecting "0" Option

Selecting the [O] option displays the output menu shown below.

CRATERS OF THE MOON NATIONAL MONUMENT WILDLIFE DATABASE

OUTPUT MENU
[M] MAP ROUTINES
[P] PLOT SEASONAL DISTRIBUTIONS FOR ALL SPECIES
[S] PRINT SPECIES LIST
[R] RETURN TO MAIN MENU

Selecting "M" Option

The [M] option in this menu brings up a menu of mapping options shown below.

CRATERS OF THE MOON NATIONAL MONUMENT WILDLIFE DATABASE

MAPPING MENU
[I] MAP INDIVIDUAL SPECIES DISTRIBUTIONS
[M] PRINT MAPS FOR ALL SPECIES
[D] DEMO OF ALL MAPS ON SCREEN ONLY
[S] PLOT SPECIAL DISTRIBUTION MAP
[R] RETURN TO OUTPUT MENU

The first option [I] will plot (on screen or paper) the distribution of a single species. The user is first shown a list of available files (.DIS files), one for each species (using the four letter abbreviations) known to occur on the monument. After selecting the species of interest, the user is asked if hard copy is needed then the map is displayed on screen and printed (if requested). Two sample maps are shown below (see figures 1 and 2). The first is for the northern flicker. It shows where the species has been seen, believed to nest and known to nest by the different shading patterns as indicated in the key. The second map shows the distribution of observations for pronghorn antelope. This is typical of mammal distribution maps in that

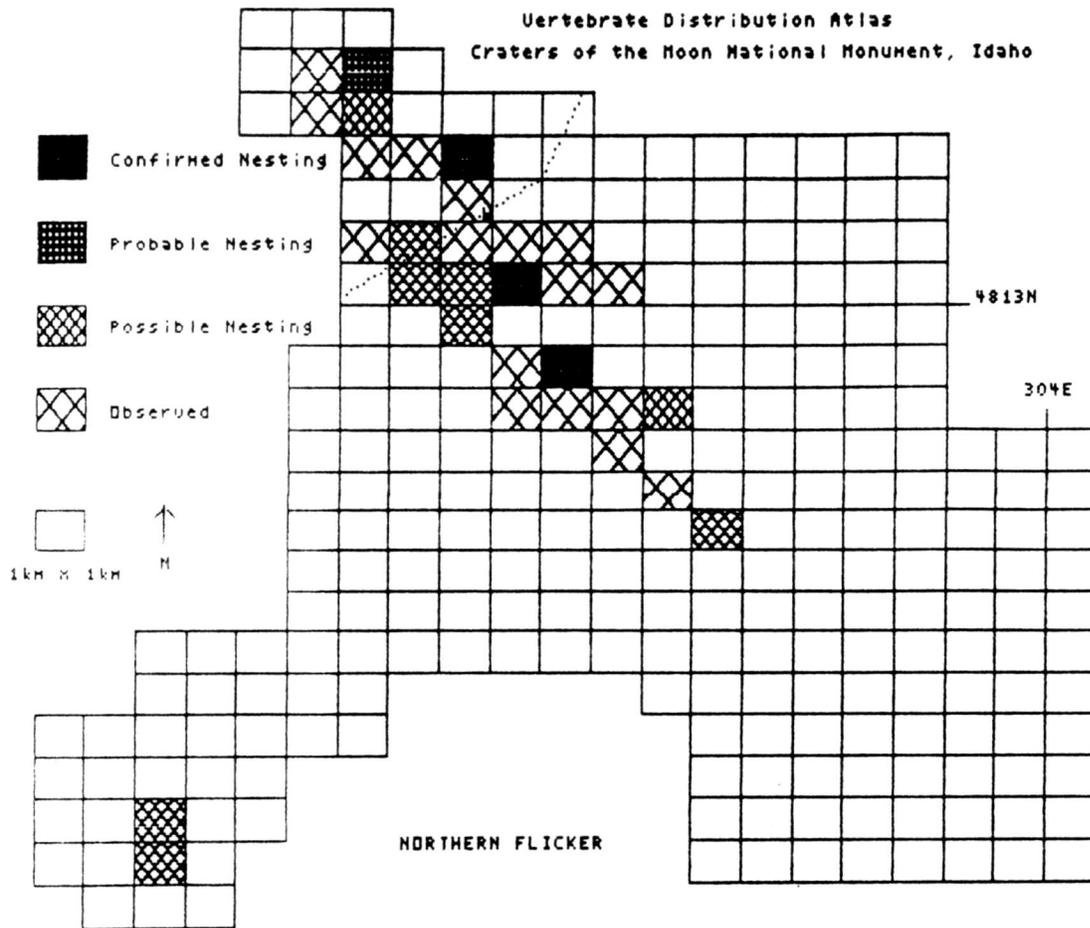


Figure 1. Sample map from the Craters of the Moon National Monument Wildlife Database System.

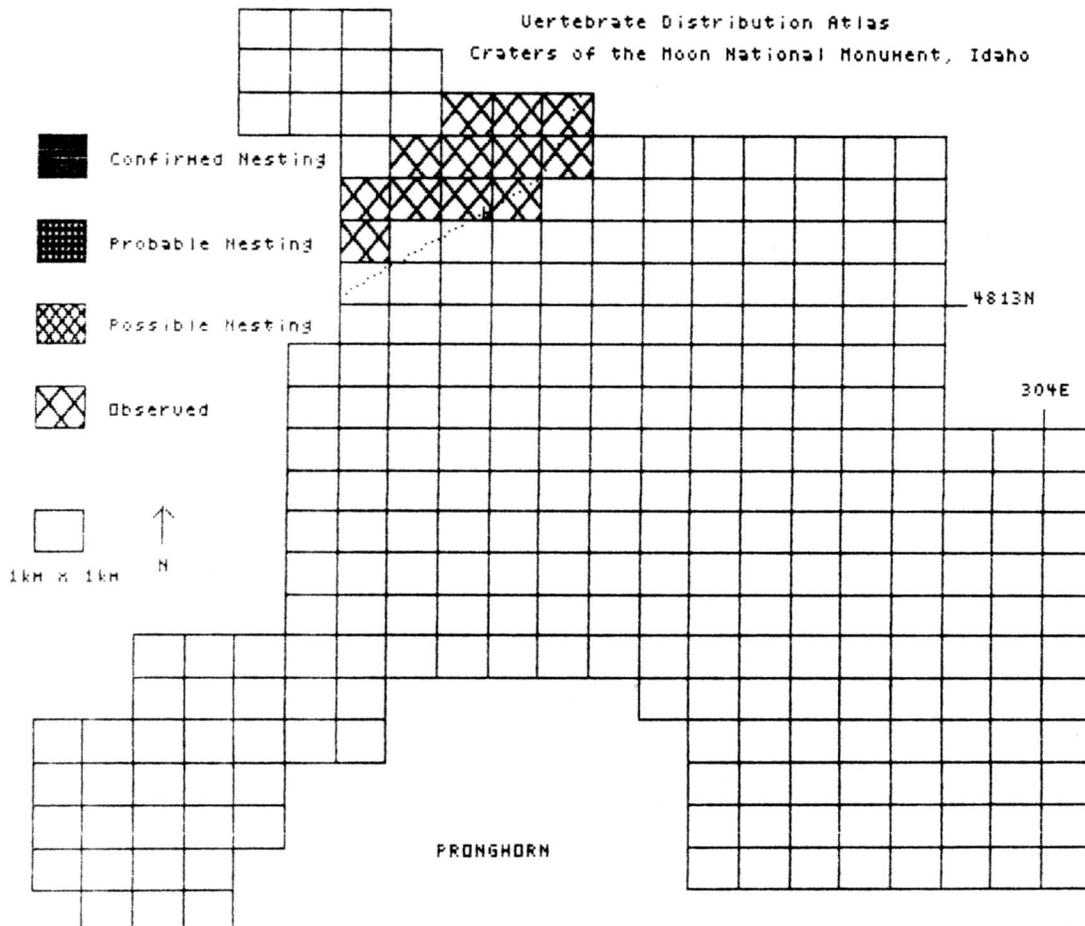


Figure 2. Sample map from the Craters of the Moon National Monument Wildlife Database System.

all records are of observations only, no breeding data are included as they are not really relevant.

The [M] option of the mapping menu is identical to that of the [I] except instead of asking the user for a single species to map it prints maps for all species in the file 'filelist.txt' which as a default includes all species abbreviations on the monument's checklist. (note: This file can be modified to include a specific group of species if maps of those species are required. The only requirements are that the file be a list of four letter abbreviations, corresponding to existing files, with QUIT as the last line.)

The [D] option is the same as above except the maps are shown on screen only.

The [S] option is similar to the [I] option except that the format of the maps is different. Rather than shading squares of a 1 kilometer by 1 kilometer grid, this routine plots specific locations. Although the symbols are 0.2 km by 0.2 km, their centers can be positioned to the precision available by the screen and printer. Figures 3 and 4 are examples of this type of map. The data files for these maps must be created by the user in the following format: the first line is reserved for the label (positioning is possible by adding spaces to the left of the label), the rest of the file consists of utm coordinates and comments as shown below. The comments are for documentation only, they do not appear on the map. These files must have the extension of ".DOT". An example of a ".DOT" file is shown below (this is for active raptor nests, 1987). The [R] option returns the user to the output menu.

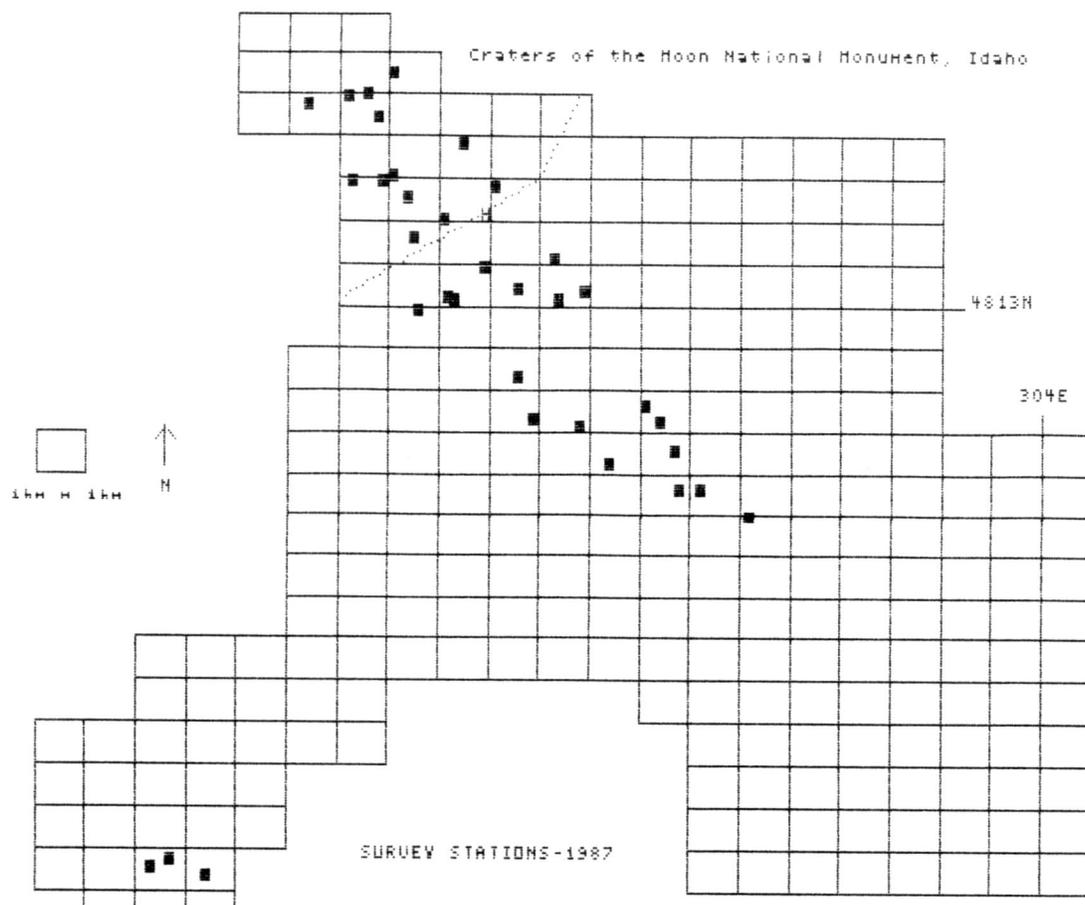


Figure 3. Sample map from the Craters of the Moon National Monument Wildlife Database System.

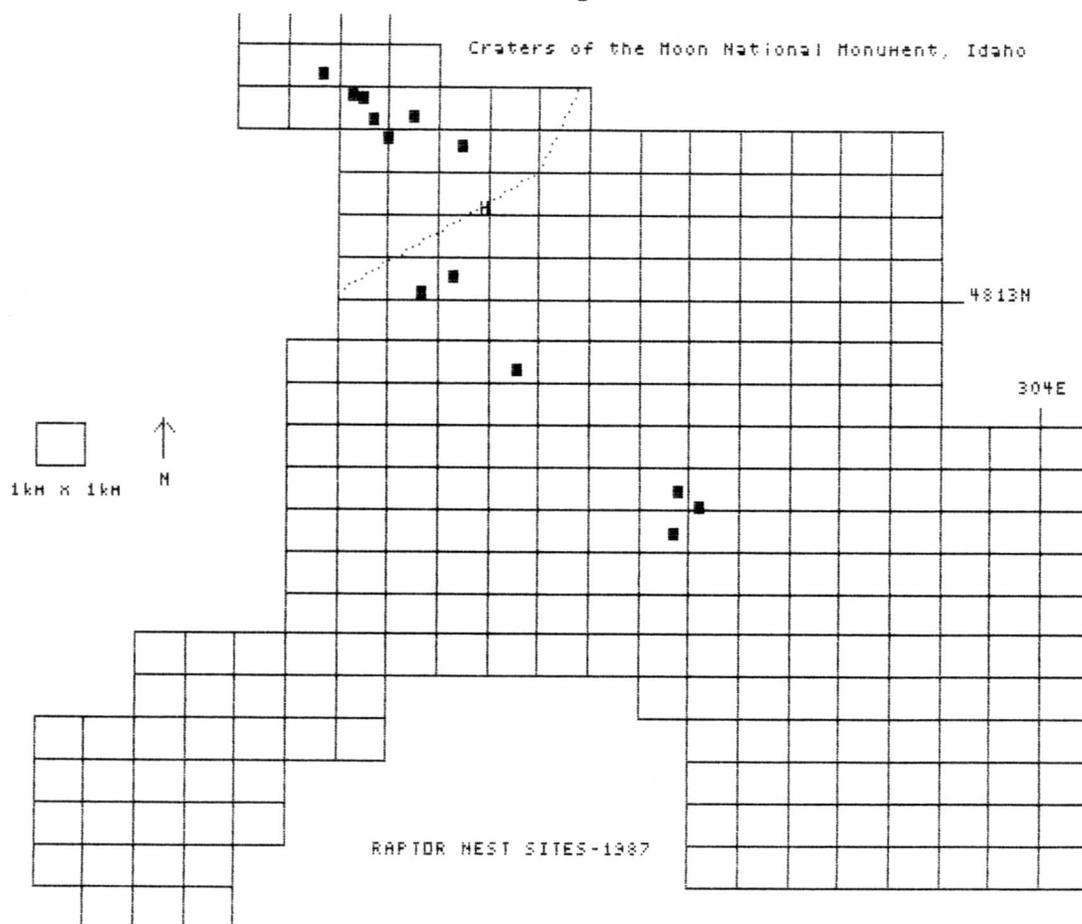


Figure 4. Sample map from the Craters of the Moon National Monument Wildlife Database System.

EXAMPLE OF .DOT FILE FORMAT

```

          RAPTOR NEST SITES-1987
296.6  4807.5      PRAIRIE FALCON
297.1  4808.1      COMMON RAVEN
296.7  4808.5      AMERICAN KESTREL
293.5  4811.4      NORTHERN HARRIER
291.6  4813.2      RED-TAILED HAWK
292.2  4813.6      COMMON RAVEN
292.4  4816.7      NORTHERN HARRIER
290.9  4816.9      NORTHERN HARRIER
291.4  4817.4      COMMON RAVEN
290.6  4817.3      LONG-EARED OWL
290.4  4817.8      AMERICAN KESTREL
290.2  4817.9      AMERICAN KESTREL
289.6  4818.4      AMERICAN KESTREL

```

Selecting "P" Option

The [P] option will plot on-screen seasonal distributions for all species listed in the filelist.txt file described above. The files used by this routine have the extension (.DTE) for dates. An option also exists to have hard-copy of these plots. These plots, as shown in figures 5 and 6 consist of an identifying abbreviation for each species and hatch marks corresponding to each day of the year with records for that species. There are three different sizes of hatch marks. If one record exists for a given day of the year, then a short hatch line is plotted, if two records are in the database for the same date in different years, then a longer hatch line is plotted and if three or more records exist for the same day in different years the longer line is plotted. Figure 5 shows some typical summer residents contrasting their different arrival dates and departure dates. Figure 6 includes a number of migrants; present at CRMO only during a period in the spring and fall. The Ruby-crowned Kinglet (RCKI) and the Hermit Thrush (HETH) are good examples of these migratory birds.

SEASONAL DISTRIBUTIONS FOR THE VERTEBRATES
OF CRATERS OF THE MOON NATIONAL MONUMENT

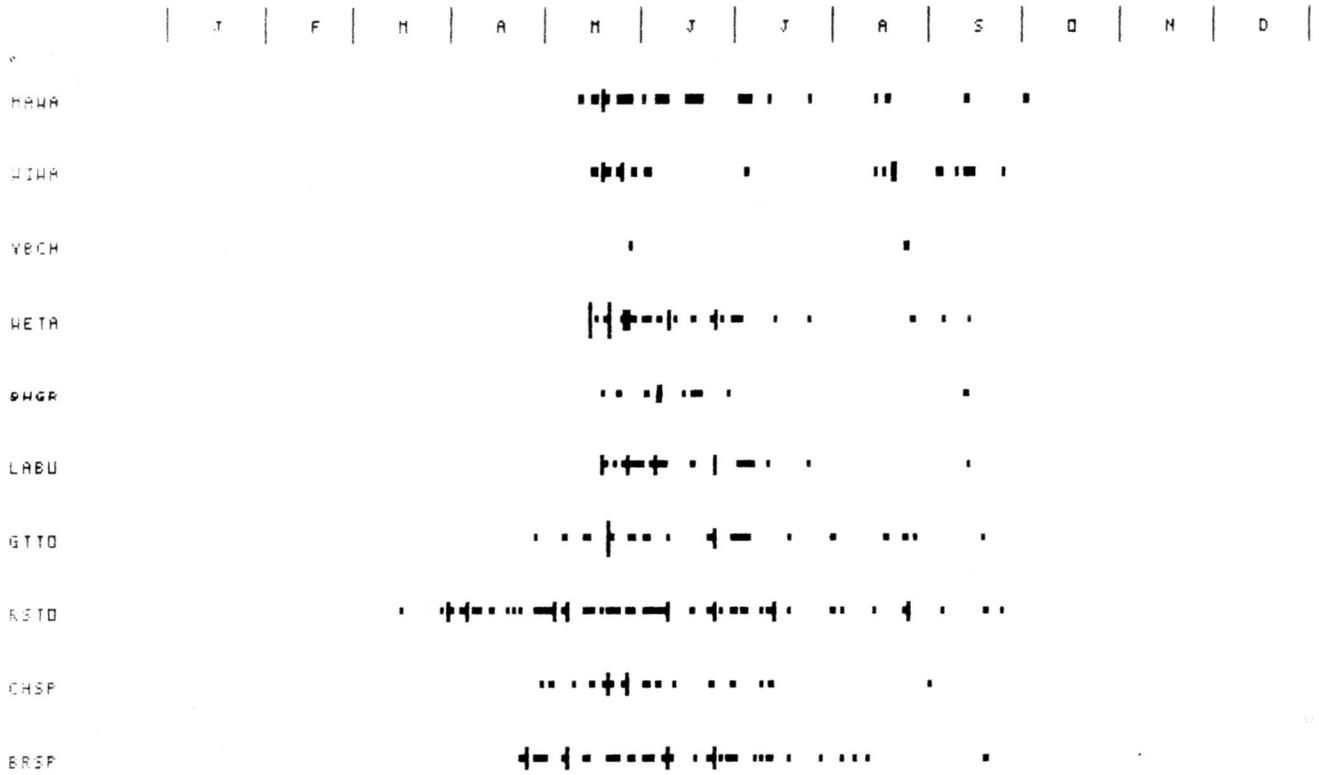


Figure 5. Sample seasonal distribution plot from the Craters of the Moon National Monument Wildlife Database System.

SEASONAL DISTRIBUTIONS FOR THE VERTEBRATES
OF CRATERS OF THE MOON NATIONAL MONUMENT

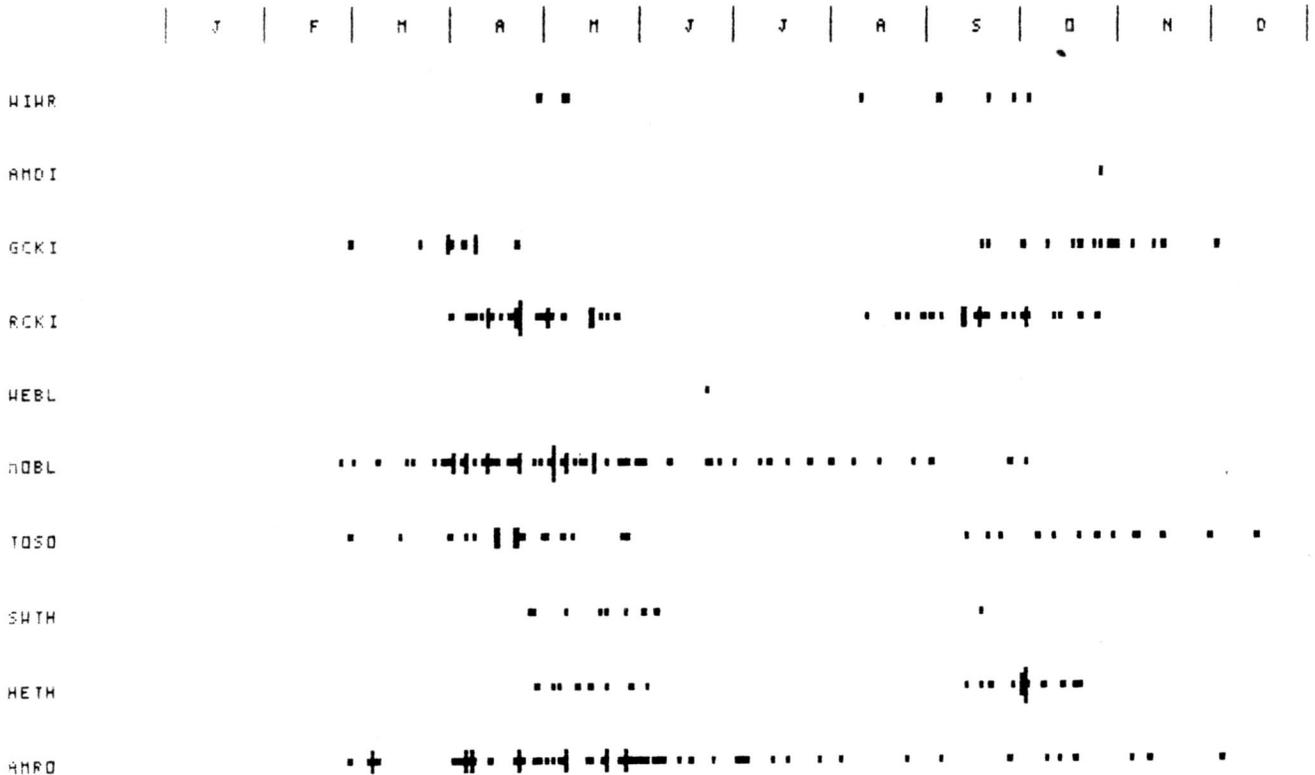


Figure 6. Sample seasonal distribution plot from the Craters of the Moon National Monument Wildlife Database System.

Selecting "S" Option

The [S] option will print a species list of all vertebrates with records for Craters of the Moon National Monument. This list is stored in a file called SPPLIST.TXT and can be imported into any word-processing program for editing or use in another document. Amphibians and reptiles are in the first group, birds next and mammals last. Within each group, the individual species are listed in taxonomic order. An example species list follows.

CRATERS OF THE MOON NATIONAL MONUMENT
VERTEBRATE SPECIES LIST
AS OF 05/08/88

```

1 WESTERN TOAD
2 BOREAL CHORUS FROG
.
.
.
9 WESTERN GARTER SNAKE
10 WESTERN RATTLESNAKE

11 EARED GREBE
12 GREAT BLUE HERON
.
.
.
156 EVENING GROSBEAK
157 HOUSE SPARROW

158 VAGRANT SHREW
159 MERRIAM'S SHREW
.
.
.
200 MULE DEER
201 PRONGHORN

```

As always, the [R] option returns the user to the previous menu, in this case the main menu.

Selecting "B" or "E" Options

There are two additional options on the main menu, [B] initiates the backup routine and [Q] quits the system. The backup routine gives on-screen instructions for backing up the wildlife system files to diskette. This

diskette could be used to reinstall the system in the event of a hard disk failure. It would be good practice to keep two of these diskettes and alternate their use each time the system is backed up. The backup procedure should be run after significant amounts of new information have been entered into the system.

The quit option exits the wildlife system and enters the dBASE interactive system. From here the user can type "quit" to return to the dos prompt or enter interactive commands to perform complex searches of the wildlife observation databases.

The interactive system provides great flexibility in the way the information in the wildlife databases can be searched. For those familiar with dBASE, the databases of concern are called WILDLIFE.DBF (all observations are archived here) and CHKLST.DBF (a summary of species' observations by habitat and month). TEMPOBS.DBF and NEWOBS.DBF are used by the system in updating the other files. The interactive system allows the user to generate species lists for a given habitat or month of the year quite simply. To do this, the user types "USE CHKLST" at the dot prompt then "LIST NAME FOR H12". This example will list all species (in taxonomic order) with records for habitat number 12. To print this, the command is modified as "LIST NAME FOR H12 TO PRINT". Species lists for specific months of the year are generated similarly by "LIST NAME FOR JAN TO PRINT" (three letter abbreviations are used for each month). Combinations are also possible by linking conditions with two operators; ".OR." and ".AND.". The periods surrounding the operators "OR" and "AND" are required. For example; to list all species with records for the winter months and also found in habitat number 22, the user would type "LIST NAME FOR (DEC .OR. JAN .OR. FEB .OR. MAR) .AND. H22 TO PRINT". It is

recommended that the user consult the dBASE manual for more complex operations.

APPENDIX A

LISTING OF TYPICAL FILE EXTENSIONS¹

Extension	File type
.EXE ²	Executable file
.COM ²	Command file
.BAT ²	Batch file consisting of Dos commands
.ASC	Text files (in ASCII format)
.BAK	Backup files
.DAT	Data file (usually for statistical packages)
.DBF	dBASE database files
.DIS	Distribution files for wildlife system.
.DOC	One type of wordprocessing file
.DTE	Seasonal distribution files for wildlife system.
.LAB	Used with NCSS statistical package
.NDX	dBASE index files
.PIC	Picture or graphics file
.PRG	dBASE program files
.PRN	Text files (in ASCII format)
.SYS	IBM System files
.TXT	Text files (in ASCII format)
.WK1 or .WKS	Lotus worksheet files

1. Often the extension names used by a given software package are listed in the manual accompanying that software.

2. Programs with these extensions will execute a program from the dos prompt simply by typing the name (without the extension).

APPENDIX B

SPECIES ABBREVIATIONS USED IN THE CRMO WILDLIFE DATABASE SYSTEM

AMPHIBIANS AND REPTILES

GOSN GOPHER SNAKE	WERA WESTERN RATTLESNAKE
RUBO RUBBER BOA	WESK WESTERN SKINK
SALI SAGEBRUSH LIZARD	WETO WESTERN TOAD
SHLI SHORT HORNED LIZARD	WYBR WESTERN YELLOW-BELLIED RACER
WEGS WESTERN GARTER SNAKE	

BIRDS

AMCR AMERICAN CROW	AMRO AMERICAN ROBIN
AMDI AMERICAN DIPPER	BAEA BALD EAGLE
AMGO AMERICAN GOLDFINCH	BAOW BARN OWL
AMKE AMERICAN KESTREL	BASW BARN SWALLOW
AMRE AMERICAN REDSTART	BBMA BLACK-BILLED MAGPIE
BCCH BLACK-CAPPED CHICKADEE	BLGR BLUE GROUSE
BCHU BLACK-CHINNED HUMMING.	BOWA BOHEMIAN WAXWING
BEKI BELTED KINGFISHER	BRBL BREWER'S BLACKBIRD
BHCO BROWN-HEADED COWBIRD	BRCR BROWN CREEPER
BHGR BLACK-HEADED GROSBEAK	BRSP BREWER'S SPARROW
BTSP BLACK-THROATED SPARROW	CEWA CEDAR WAXWING
BWTE BLUE-WINGED TEAL	CHSP CHIPPING SPARROW
CAFI CASSIN'S FINCH	CHUK CHUKAR
CAGO CANADA GOOSE	CLNU CLARK'S NUTCRACKER
CAHU CALLIOPE HUMMINGBIRD	COFL COMMON FLICKER
COHA COOPER'S HAWK	COSN COMMON SNIPE
CONI COMMON NIGHTHAWK	DEJU DARK-EYED JUNCO
COPO COMMON POORWILL	DOWO DOWNY WOODPECKER
CORA COMMON RAVEN	DUFL DUSKY FLYCATCHER
CORE COMMON REDPOLL	EAGR EARED GREBE
EAKI EASTERN KINGBIRD	GBHE GREAT BLUE HERON
EUST EUROPEAN STARLING	GCKI GOLDEN-CROWNED KINGLET
EVGR EVENING GROSBEAK	GCSP GOLDEN CROWNED SPARROW
FEHA FERRUGINOUS HAWK	GHOW GREAT HORNED OWL
FOSP FOX SPARROW	GOEA GOLDEN EAGLE
GRCA GRAY CATBIRD	HAFH HAMMOND'S FLYCATCHER
GRJA GRAY JAY	HAWO HAIRY WOODPECKER
GRPA GRAY PARTRIDGE	HEGU HERRING GULL
GTTO GREEN-TAILED TOWHEE	HETH HERMIT THRUSH
GWTE GREEN-WINGED TEAL	HOFI HOUSE FINCH

HOLA HORNED LARK	LASP LARK SPARROW
HOSP HOUSE SPARROW	LEOW LONG-EARED OWL
HOWR HOUSE WREN	LEWO LEWIS' WOODPECKER
KILL KILLDEER	LISP LINCOLN'S SPARROW
LABU LAZULI BUNTING	LOSH LOGGERHEAD SHRIKE
MALL MALLARD	MODO MOURNING DOVE
MAWA MACGILLIVRAY'S WARBLER	NAWA NASHVILLE WARBLER
MERL MERLIN	NOGO NORTHERN GOSHAWK
MOBL MOUNTAIN BLUEBIRD	NOHA NORTHERN HARRIER
MOCH MOUNTAIN CHICKADEE	NOOR NORTHERN ORIOLE
NOSH NORTHERN SHRIKE	PIJA PINYON JAY
NSWO NORTHERN SAW-WHET OWL	PISI PINE SISKIN
OCWA ORANGE-CROWNED WARBLER	PRFA PRAIRIE FALCON
OSFL OLIVE-SIDED FLYCATCHER	RBGU RING-BILLED GULL
PIGR PINE GROSBEAK	RBNU RED-BREASTED NUTHATCH
RCKI RUBY-CROWNED KINGLET	RNSA RED-NAPED SAPSUCKER
RECR RED CROSSBILL	RODO ROCK DOVE
RHWO RED HEADED WOODPECKER	ROFI ROSY FINCH
RLHA ROUGH-LEGGED HAWK	ROWR ROCK WREN
RNPH RING-NECKED PHEASANT	RSTO RUFIOUS-SIDED TOWHEE
RTHA RED-TAILED HAWK	SAPH SAY'S PHOEBE
RUGR RUFFED GROUSE	SATH SAGE THRASHER
RUHU RUFIOUS HUMMINGBIRD	SEOW SHORT-EARED OWL
RWBL RED-WINGED BLACKBIRD	SGSP SAGE SPARROW
SAGR SAGE GROUSE	SNBU SNOW BUNTING
SNGO SNOW GOOSE	STJA STELLER'S JAY
SOSP SONG SPARROW	SVSP SAVANNAH SPARROW
SOVI SOLITARY VIREO	SWHA SWAINSON'S HAWK
SPSA SPOTTED SANDPIPER	SWTH SWAINSON'S THRUSH
SSHA SHARP-SHINNED HAWK	TEWA TENNESSEE WARBLER
TOSO TOWNSEND'S SOLITAIRE	VGSW VIOLET-GREEN SWALLOW
TOWA TOWNSEND'S WARBLER	WAPI WATER PIPIT
TUVU TURKEY VULTURE	WAVI WARBLING VIREO
VATH VARIED THRUSH	WBNU WHITE-BREASTED NUTHATCH
VESP VESPER SPARROW	WCSP WHITE-CROWNED SPARROW
WEBL WESTERN BLUEBIRD	WEWP WESTERN WOOD-PEWEE
WEFL WESTERN FLYCATCHER	WIFL WILLOW FLYCATCHER
WEKI WESTERN KINGBIRD	WISA WILLIAMSON'S SAPSUCKER
WEME WESTERN MEADOWLARK	WIWA WILSON'S WARBLER
WETA WESTERN Tanager	WIWR WINTER WREN
WTSP WHITE-THROATED SPARROW	YHBL YELLOW-HEADED BLACKBIRD
WTSW WHITE-THROATED SWIFT	YRWA YELLOW-RUMPED WARBLER
YBCH YELLOW-BREASTED CHAT	
YBSA YELLOW-BELLIED SAPSUCKER	
YEWA YELLOW WARBLER	

ATFL	ASH-THROATED FLYCATCHER	VEER	VEERY
BBWP	BLACK-BACKED WOODPECKER	REVI	RED-EYED VIREO
BUOW	BURROWING OWL	BTGW	BLACK-THROATED GRAY WARBLER
CAGU	CALIFORNIA GULL	HASP	HARRIS' SPARROW
TTWO	THREE-TOED WOODPECKER	COGR	COMMON GRACKLE

MAMMALS

BADG	BADGER	BTJR	BLACK-TAILED JACKRABBIT
BBBA	BIG BROWN BAT	BTWR	BUSHY-TAILED WOODRAT
BEAV	BEAVER	CAMY	CALIFORNIA MYOTIS
BLBE	BLACK BEAR	COYO	COYOTE
BOBC	BOBCAT	DEMO	DEER MOUSE
ELKK	ELK	Hoba	HOARY BAT
GMGS	GOLDEN-MANTLED GROUND SQUIRREL	KIFO	KIT FOX
GBPM	GREAT BASIN POCKET MOUSE	LBBA	LITTLE BROWN BAT
		LEBA	LONG-EARED BAT
		LECH	LEAST CHIPMUNK
LTVO	LONG-TAILED VOLE	MOVO	MOUNTAIN VOLE
LTWE	LONG-TAILED WEASEL	MUDE	MULE DEER
MESH	MERRIAM'S SHREW	NPGO	NORTHERN POCKET GOPHER
MOCT	MOUNTAIN COTTONTAIL	PIKA	PIKA
MOLI	MOUNTAIN LION	PORC	PORCUPINE
PRON	PRONGHORN	SNHA	SNOWSHOE HARE
PYRA	PYGMY RABBIT	SFMY	SMALL-FOOTED MYOTIS
RACC	RACCOON	STSK	STRIPED SKUNK
REFO	RED FOX	STWE	SHORT-TAILED WEASEL
RESQ	RED SQUIRREL	VASH	VAGRANT SHREW
WBEB	WESTERN BIG-EARED BAT	YBMA	YELLOW-BELLIED MARMOT
WHMO	WESTERN HARVEST MOUSE	YPCH	YELLOW PINE CHIPMUNK
WJMO	WESTERN JUMPING MOUSE	UIGS	UINTA GROUND SQUIRREL
WSSK	WESTERN SPOTTED SKUNK		
WTJR	WHITE-TAILED JACKRABBIT		
SHBA	SILVER-HAIRED BAT		

APPENDIX C

HABITAT CODES AND DESCRIPTIONS
USED IN THE WILDLIFE DATABASE SYSTEM

- 1 Cinder Gardens
- 2 Low Density Lava Flows
- 3 Medium Density Lava Flows
- 4 Mountain Big Sagebrush/Bluebunch Wheatgrass
- 5 Mountain Big Sagebrush/Sandberg Bluegrass
- 6 Mountain Big Sagebrush/Needle Grass
- 7 Mountain Big Sagebrush/Needle-and-thread/Cheatgrass
- 8 Mountain Big Sagebrush/Idaho Fescue
- 9 Big Sagebrush/Cheatgrass
- 10 Complex of 4 and 8
- 11 Three-tip Sagebrush/Idaho Fescue
- 12 Early Low Sagebrush/Idaho Fescue
- 13 Low Sagebrush/Sandberg Bluegrass
- 14 Low Sagebrush/Idaho Fescue
- 15 Complex of 13 and 14
- 16 Antelope Bitterbrush
- 17 Antelope Bitterbrush/Great Basin Wildrye
- 18 Bluebunch Wheatgrass/Idaho Fescue
- 19 Mountain Big Sagebrush/Needle Grass
- 20 Mountain Big Sagebrush/Sandberg Bluegrass
- 21 Limber Pine/Antelope Bitterbrush (low total cover)
- 22 Limber Pine/Antelope Bitterbrush (high total cover)
- 23 Limber Pine/Antelope Bitterbrush (high density Limber Pine)
- 24 Douglas-Fir/Mountain Snowberry
- 25 Upland Quaking Aspen
- 26 Riparian
- 27 Developed areas
- 28 Caves
- 29 Rocky outcrops
- 30 Man-made structures
- 31 Isolated trees
- 32 Waterholes

APPENDIX D

CRITERIA FOR DETERMINING BREEDING STATUS OF BIRDS.
(FROM BREEDING BIRD SURVEY)

STATUS	CODE	EVIDENCE
OBSERVED	O	Species (male or female) observed in block.
POSSIBLE BREEDING	/	Species (male or female) observed in suitable nesting habitat during its breeding season.
habitat	X	Singing male present in suitable nesting during its breeding season.
PROBABLE BREEDING	P	<u>Pair</u> observed in suitable habitat during its breeding season.
	T	Permanent <u>territory</u> presumed through defense (e.g. chasing of other birds; or song at the same location on at least two occasions a week or more apart).
	C	<u>Courtship</u> behavior or <u>copulation</u> .
	N	Visiting probable <u>nest-site</u> .
	A	<u>Agitated</u> behavior or anxiety calls from adult.
	B	Nest <u>building</u> by wrens or excavation of holes by woodpeckers.
CONFIRMED BREEDING	NB	<u>Nest building</u> by all except woodpeckers and wrens.
	PE	<u>Physiological evidence</u> of breeding (i.e., highly vascularized edematous incubation patch or egg in oviduct) based on bird in hand.
	DD	<u>Distraction display</u> .
	UN	<u>Used nest</u> or eggshells found. Caution: These must be carefully identified, if they are to accepted. ¹

¹. Presence of cowbird eggs or young is confirmation of both cowbird and host species.

STATUS	CODE	EVIDENCE
CONFIRMED BREEDING (cont.)	FL	Recently <u>fledged young</u> (of altricial species) incapable of sustained flight ¹ or downy young (of precocial species) restricted to the natal area by dependence on adults or limited mobility.
	ON	<u>Occupied nest</u> ; adult entering or leaving nest site in circumstances indicating occupied nest (includes high nests or nestholes, the contents of which cannot be seen) or adult incubating or brooding.
	AY	<u>Attending young</u> ; adult carrying fecal sac or food for young, or feeding ¹ recently fledged young.
	NE	<u>Nest with egg(s)</u> . ¹
	NY	<u>Nest with young</u> seen or heard. ¹

¹. Presence of cowbird eggs or young is confirmation of both cowbird and host species.