



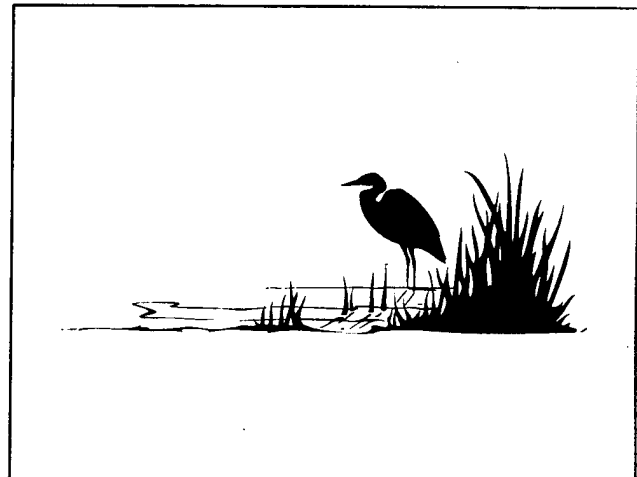
**US Army Corps  
of Engineers**

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Research Laboratories

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June 1997

# **Data Collection Programs in Support of Endangered Bird Management at Fort Hood, Texas**

by  
Steve T. Mackie  
Timothy J. Hayden



Supporting the military mission while continuing to protect threatened and endangered (T&E) species presents a unique challenge to the Army. Land managers need species-specific information to help them make better decisions regarding training exercises, troop and vehicle movements, and other mission requirements. Traditional methods of collecting data in the field and manually entering it into computer databases for analysis lag behind technological capabilities. To address these problems, land managers at Fort Hood, TX, tasked the U.S. Army Construction Engineering Research Laboratories with developing an efficient program for use by field technicians who collect survey data on endangered birds inhabiting the installation.

- This report presents nine programs designed to be run in the field during survey and data collection activities. The programs require an IBM®-compatible computer with at least a 386 processor, 4 MB of RAM, 20MB of available hard disk space, and running Windows® 3.1 or higher and Excel®. The programs also use an electronic pen; previous experience with that technology is helpful.

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Supporting the military mission while continuing to protect threatened and endangered (T&E) species presents a unique challenge to the Army. Land managers need species-specific information to help them make better decisions regarding training exercises, troop and vehicle movements, and other mission requirements. Traditional methods of collecting data in the field and manually entering it into computer databases for analysis lag behind technological capabilities. To address these problems, land managers at Fort Hood, TX, tasked the U.S. Army Construction Engineering Research Laboratories with developing a an efficient program for use by field technicians who collect survey data on endangered birds inhabiting the installation.

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## Foreword

This study was conducted for III Corps Fort Hood under Military Interdepartmental Purchase Requests 329-94 and 319-95 "Monitoring BCVI and GCWA on Fort Hood." The technical monitor was Dennis Herbert, AFZF-PW-ENV-NR.

The work was performed by the Natural Resource Assessment and Management Division (LL-N) of the Land Management Laboratory (LL), U.S. Army Construction Engineering Research Laboratories (USACERL) in cooperation with the Fort Hood Natural Resources Branch. The USACERL principal investigator was Timothy J. Hayden. Several individuals were invaluable in helping design these programs. Howard Weinberg was an integral part of designing the Black-Capped Vireo program and gave many valuable suggestions for the banding and sighting/recaptures program. Maria Tolle, Fort Hood Natural Resources Branch, contributed helpful advice on the point count and Golden-Cheeked Warbler programs. Gil Eckrich, Fort Hood Natural Resources Branch, provided constructive comments on the Brown-Headed Cowbird trapping and non-target species programs. By executing the programs and entering data, Teresa Koloszar, Fort Hood Natural Resources Branch, provided keen insight from a user's perspective. Without the assistance and helpful comments from these people, this work would not have been possible. Dr. David J. Tazik is Acting Chief, CECER-LL-N; Dr. William D. Severinghaus is Operations Chief, CECER-LL. The USACERL technical editor was Gloria J. Wienke, Technical Resources.

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# 1 Introduction

## Background

Supporting the military mission while continuing to protect endangered species presents a unique challenge to the Army. Much of the threatened and endangered (T&E) species research conducted on installations focuses on assessing and monitoring military activity impacts on T&E species inhabiting Army lands. The Army is increasingly committing significant resources, both financial and personnel, for research and monitoring T&E species on military lands. These activities require collecting, storing, and monitoring large amounts of data. In the past, data was collected by hand via pen and pad and then stored later back at the office. Data handled this way could end up being inconsistent, undecipherable, and possibly even lost. To address that problem, the U.S. Army Construction Engineering Research Laboratories (USACERL) began to develop and use a variety of state-of-the-art computer hardware and software capabilities to enhance and efficiently increase field data collection, storage, and manipulation. As part of that overall process, land managers at Fort Hood, TX, tasked USACERL with developing an efficient program for use by field technicians who collect survey data on endangered birds inhabiting the installation.

## Objective

The objective of this research was to develop computer programs to efficiently collect, store, and retrieve field data on endangered bird species at Fort Hood, TX. The programs were to (1) be easy to use, (2) ensure data accuracy, and (3) save time and money.

## Approach

Initial program design and development was based on field data collected in previous years by Fort Hood natural resources personnel. Program design, layout, and functionality changes were made after consulting with personnel at USACERL and

Fort Hood. Final refinements were made after field testing the programs during the 1994 breeding season.

The programs include:

Banding Survey Program  
Brown-Headed Cowbird Banding Program  
Sightings/Recaptures Program  
Point Count Program  
Brown-Headed Cowbird Trapping Program  
Non-Target Species Program  
Black-Capped Vireo Program  
Golden-Cheeked Warbler Program  
Database Backup Program

## Program Installation

The programs should be run on an IBM-compatible computer using Microsoft Windows 3.1 or higher to interface with MS-DOS. The computer should contain at least a 386 processor, 4 MB of RAM and 20 MB of available hard disk space. Microsoft Office with Excel\* must be installed on the computer. The user should have a basic working knowledge of Windows and know how to use an electronic mouse. The programs also use an electronic pen; previous experience with that technology is helpful.

The program files are supplied on 3.5-in. diskettes with an installation program included. To install these files, Microsoft Windows must be running on the computer. Follow the steps below.

1. Create a subdirectory called "VB" under the C:\ root directory.  
("VB" represents Visual Basic as will be explained in the next chapter.)
2. Insert the program disks into drive A: (or B:).
2. Select "File" from the Program Manager menu.
3. Select "Run" from the pop-up menu.
4. Select "Browse."
5. Go to drive A: (or B:) and double click on the file "setup.exe" and select "OK."

---

\* Windows and Excel are registered trademarks of Microsoft Corporation.

6. Change the default installation drive from "C:\..." to "C:\VB\..." where "... " specifies the default program directory. Each program directory will contain the software for each individual program.
7. Select "OK."
8. When installation is complete, a default program group and item will be created. After all programs have been installed, it's a good idea to transfer all program items under one common program group called Fort Hood Bird Survey to reduce clutter on the screen.
9. Transfer the file "vb.ini" from the program directory to the "C:\VB" subdirectory.

## Executing the Programs

All data collection programs written for Fort Hood should be in the program group titled Fort Hood Bird Survey. Each program is associated with a generic icon that has the program name underneath it. Before starting any program, make sure the file "share.exe" is running from under the C:\WINDOWS subdirectory. To execute a program, use the mouse to position the cursor over the program and double tap it with the pen. For documentation purposes, every program requires you to enter your initials. As long as you keep running a program, your initials will become part of the records saved to that program's database.

The programs are designed to be run in the field during survey and data collection activities. Data analysis should be conducted in the office so results can be printed.

## 2 Visual Basic

All programs are written in Microsoft Visual Basic\* 3.0 and all records are saved to DBase IV database files. To run these programs effectively, it is important that you acquire a basic knowledge of the components making up Visual Basic's programming language as well as the basic software and data files you'll be using.

In Visual Basic, all items on a form (or window) are called controls. Controls are the interface between the program and the user. Controls gather and manipulate your input as well as format and display output. They perform certain functions based on your response. Of special interest are command buttons, spin buttons, option buttons, check boxes, text boxes, combo boxes, list boxes, and data controls.

### 2.1 Command Buttons

Tapping a command button on the screen with the electronic pen initiates one or more actions and is the most common way for you to interact with the program. When you tap a button, its 3D image will appear to be pushed in and then released. All command buttons have a one- or two-word description written on them. Figure 1 shows an example of several command buttons.

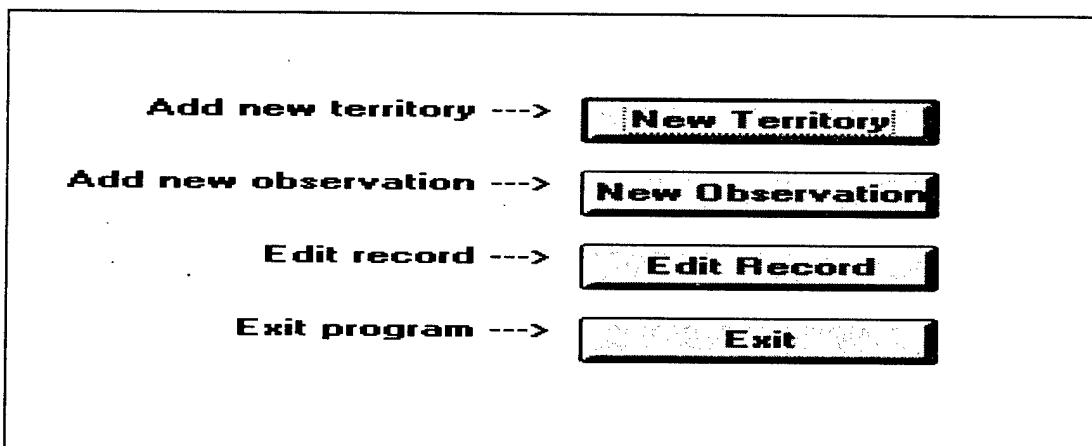


Figure 1. Command buttons.

\* Visual Basic is a registered trademark of Microsoft Corporation

## 2.2 Spin Buttons

Spin buttons are used in conjunction with text boxes to increment or decrement numbers. When you tap the up arrow, the number will increase. Conversely, when you tap the down arrow, the number decreases. You can also use spin buttons to scroll back and forth through a range of values. Figure 2 shows an example of spin buttons.

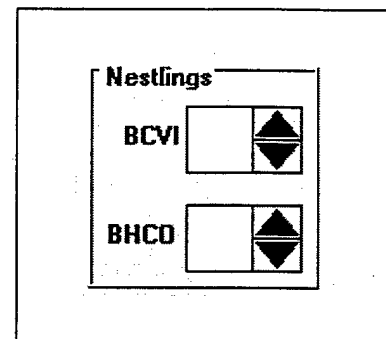


Figure 2. Spin buttons.

## 2.3 Option Buttons

The option buttons display an option that can be turned on or off. Usually, option buttons are part of an option group that displays multiple choices from which you can select only one. All others are deselected. Typically, option buttons will be grouped within a boxed frame. To select an option button, tap it with the pen. To deselect it, tap it again. Figure 3 shows a group of option buttons within a frame with Female Band Info. selected.

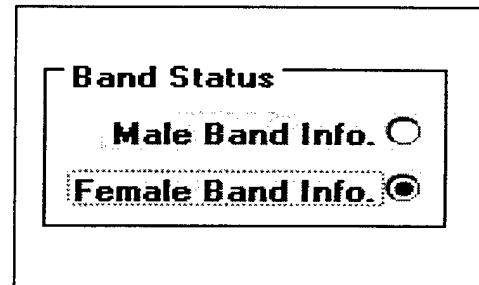


Figure 3. Option buttons.

## 2.4 Check Boxes

Check boxes display an X when you tap it and remove the X when you tap it again. Check boxes give you a True/False or Yes/No option. They are used in groups to display multiple choices from which you can select one or more. Check boxes and option buttons function similarly but with one important difference. You can select any number of check boxes on a form at the same time, however you can only select one option button in a group. Figure 4 shows an example of check boxes.

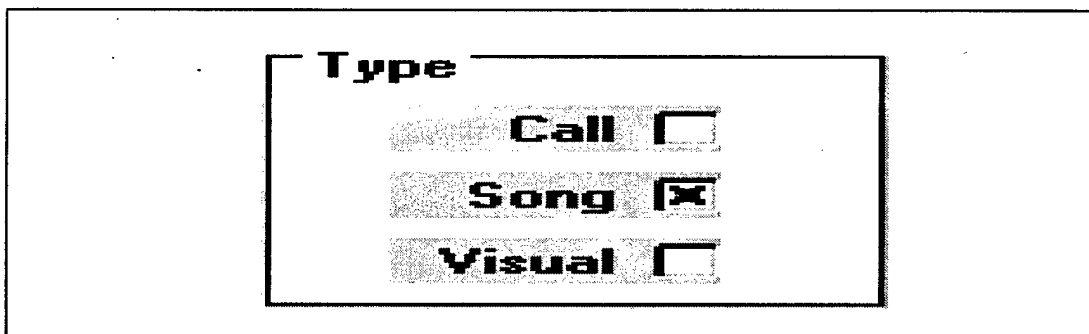


Figure 4. Check boxes.



## 2.5 Text Boxes

The text boxes display information you entered or retrieved from the database. In most cases, text boxes are tied (or linked) to corresponding fields in the database. Information in a text box usually can be edited. Figure 5 shows an example of text boxes.

Figure 5. Text boxes.

## 2.6 Combo Boxes

Combo boxes give you the choice of selecting an item from the list portion of the control or typing in the text box portion. All combo boxes are populated with specific values appropriate for the required data. Figure 6 shows an example of combo boxes.

Figure 6. Combo boxes.

## 2.7 List Boxes

List boxes display a list of items from which you can choose one item. If the number of items is greater than the length of the list box, vertical scroll arrows will appear. Figure 7 shows an example of a list boxes.

Figure 7. List boxes.

## 2.8 Data Controls

Data controls provides access to data contained in a dBase IV database. They allow you to move from record to record so you can display each one. Every data control contains two sets of left and right arrows. The outer left and right arrows bring you to the first and last records in the database, respectively. The inner left and right arrows move you one record before and after the current record, respectively. Figure 8 shows an example of data controls.

Figure 8. Data controls.

## 3 Banding Survey Program

(BAND\_SRV.MAK)

### 3.1 General Description

The Banding Survey Program records banding and measurement data on previously unbanded birds. Although this program is geared towards black-capped vireos and golden-cheeked warblers, it will record information about any bird other than brown-headed cowbirds and loggerhead shrikes, which are recorded in a separate banding database. The records are stored in one of three different DBase IV database files that you select. If you enter records for black-capped vireos, the path name is **C:\VB\BAND\_SRV\BCVI\_BND.DBF**. If you enter records for golden-cheeked warblers, the path name is **C:\VB\BAND\_SRV\GCWA\_BND.DBF**. If you enter records for other birds, the path name is **C:\VB\BAND\_SRV\BAND\_DB.DBF**. The field names and descriptions of these files are identical and are given below. Data types and data lengths are given in parentheses.

**REC\_NUMBER** (string) (4) - Number of the record in the database.

**DATE** (string) (8) - Current date.

**OBSERVER** (string) (3) - Observer's initials.

**BAND\_STAT** (string) (1) - Status of leg band.

**STAT\_CODE** (string) (3) - Category of banding detail given to a bird.

**BAND** (string) (4) - Band number prefix.

**NUMBER** (string) (5) - Band number suffix.

**SPECIES** (string) (4) - Species code.

**SP\_NUMBER** (string) (4) - A unique 4 digit code representing a bird species. The program will automatically insert this number as part of the record.

**AGE** (string) (3) - Age of bird.

**AGE\_CODE** (string) (1) - A one digit code representing a bird's age. The program will automatically insert the correct code into the record based on the entry in the AGE field.

0 - Unknown

1 - AHY (After Hatching Year)

2 - HY (Hatching Year)

4 - L (Local)

5 - SY (Second Year)

6 - ASY (After Second Year)

**SEX** (string) (1) - Numeric code representing sex of bird.

**UP\_LEFT** (string) (2) - Color code representing the upper left leg band of a banded bird.

**LOW\_LEFT** (string) (2) - Color code representing the lower left leg band of a banded bird.

**UP\_RIGHT** (string) (2) - Color code representing the upper right leg band of a banded bird.

**LOW\_RIGHT** (string) (2) - Color code representing the lower right leg band of a banded bird.

**HATCH\_ORDR** (string) (1) - Hatching order of bird.

**REGION** (string) (4) - Designated region of Fort Hood. The program will automatically insert the correct region into the record based on the entry in the TR\_AREA field.

**TR\_AREA** (string) (4) - Training Area.

**TERRITORY** (string) (2) - Territory number within a training area.

**NEST\_NUMBR** (string) (1) - Number of nest.

**EASTING** (string) (6) - UTM Easting coordinate.

**NORTHING** (string) (3) - UTM Northing coordinate.

**CP** (string) (2) - Cloacal protuberance.

**BP** (string) (2) - Brood patch.

**CAP\_PLUM** (string) (3) - Cap plumage.

**WING\_LEN** (numeric) (8) - Wing length measurement.

**TAIL\_LEN** (numeric) (8) - Tail length measurement.

**WEIGHT** (numeric) (8) - Weight measurement.

**COMMENTS** (string) (150) - Any important notes.

### 3.2 Starting the Program

To start the program, double tap the Banding Survey icon with the pen. After typing in your initials and tapping **OK**, the program will ask for which bird to enter data. The default is "BCVI." To record information for golden-cheeked warbler, write in "GCWA." To record information for any bird other than brown-headed cowbird or loggerhead shrike, write in "OTHER." Tap **OK** and the data entry form in Figure 9 will appear.

**USACERL** 1452

## BANDING SURVEY

Date  Observer

Required Data			
Species	<input type="text" value="BCVI"/>	Sex	<input type="text" value="0"/>
Band	<input type="text" value="1290"/>	Age	<input type="text" value="L"/>
Number	<input type="text" value="90898"/>	Hatching Order	<input type="text"/>

Location			
Training Area	<input type="text" value="2"/>	Easting	<input type="text" value="333"/>
Territory	<input type="text" value="43"/>	Northing	<input type="text" value="551"/>
		Nest Number	<input type="text"/>

Leg Band			
FWS Band	<input type="text" value="0"/>	Status Code	<input type="text" value="301"/>
Upper Left	<input type="text" value="NB"/>	Upper Right	<input type="text" value="NB"/>
Lower Left	<input type="text" value="LA"/>	Lower Right	<input type="text" value="SI"/>

Measurements			
CP	<input type="text"/>	Cap Plumage	<input type="text"/>
		Tail Length	<input type="text" value="0"/>
BP	<input type="text"/>	Wing Length	<input type="text" value="0"/>
		Weight	<input type="text" value="0"/>

**Action**

Record 1452 of 1452

Figure 9. Banding Survey data entry form.

Once started, the information displayed on the form is the last record in the database. The total number of records in the database is shown at the bottom left corner of the form. The number at the top right corner indicates the number of the individual record in the database. From here, you can add, edit, or view any record in the database.

### 3.3 Program Flow

#### a. Add a new record

To add a new record, tap the **New** button. All fields are cleared out except for observer, record number, FWS band, and status code which are automatically assigned default values. If you're entering data for black-capped vireos or golden-cheeked warblers, the program will also insert a species code and assign default wing length, tail length, and weight values. You can change the default observer initials by double tapping on the observer text box and entering new initials.

Of the four frames on the form, only one is enabled or "turned on." The first frame, *Required Data*, is enabled to remind you that this information must be included on every record. No other frame will be enabled until you enter data for every control in this frame. However, if you need to record a lost or damaged band, feel free to enter the band number along with a band status. The band status field is not disabled.

Date - Double tap the box to insert the current date. Use the spin button to increment/decrement the date.

Species - If you're entering data for any bird other than black-capped vireo or golden-cheeked warbler, choose a species code from the combo box. If a species doesn't appear on the list, write in the species code. The program will not accept entries for BHCO or LOSH.

Band - Except for the first record, the program will automatically insert a default band prefix if you're entering data for black-capped vireos or golden-cheeked warblers. Otherwise, choose a band prefix from the combo box. If a band prefix you want doesn't appear in the list, write it in the box.

Number - Write the band number suffix in the text box.

Sex - Choose a sex code from the combo box. If you choose "4" (male), the BP combo box field will be disabled. If you choose "5" (female), the CP combo box field will be disabled. If you choose "0"(unknown), both boxes will be disabled.

Age - Choose an age code from the combo box. Once you have selected an age code, the remaining frames will be enabled. If you choose "L," the Hatching Order combo box appears. Choose a number representing the hatching order.

FWS Band - Choose an FWS band status code from the combo box or accept the default.

Status Code - Choose a status code from the combo box or accept the default.

Upper Left - Lower Right - Choose a color code for each leg band from the combo boxes.

Training Area - Write the training area in the text box.

Territory - Use the spin button to increment/decrement the territory or write it in the text box.

Easting - Write the easting coordinate in the text box.

Northing - Write the northing coordinate in the text box.

Nest Number - Choose a number from the combo box.

CP - Choose a CP code from the combo box.

BP - Choose a BP code from the combo box.

Cap/Plum - Choose a Cap/Plum code from the combo box.

Wing Length - Use the spin button to increment/decrement the default wing length.

Tail Length - Use the spin button to increment/decrement the default tail length.

Weight - Use the spin button to increment/decrement the default weight by 0.1 grams.

Comments - Tap the **Comments** button. In the white space provided, write in any necessary comments. To eliminate or close the Comments box, double tap it.

b. Edit a record

To edit a record, tap the **Edit** button. Figure 10 shows the resulting band number selection form:

The form is titled "USACERL BANDING SURVEY" and displays "Record 1489 of 1489". It contains several input fields: Date (08/03/95), Observer, Species, Band, Number, Location, Training Area, and Territory. A "Select Band Prefix -->" dropdown menu is open, showing a list of band numbers: 1290, 1320, 1480, 1710, 1800, 1810, 1840, 1880, 1930, 1960, 2171, and 3500. A "Cancel" button is located below the list. At the bottom of the form, there are buttons for "New", "Edit", "Summary", "Cancel", "Save", and "Exit".

Figure 10. Band number selection form.

Tap the band number prefix you want and a list of band number suffixes will appear in the same box. Tap the band number suffix you want and the data entry form will reappear displaying the record you wish to edit. If you want to forego the edit process, tap **Cancel** to remove the selection form and return you to the data entry form.

c. Summary

To view a list of birds banded within each training area for the database you're working with, tap **Summary**. Figure 11 shows an example of all GCWAs banded

<div> <div> <div>◀</div> <div>◀</div> <div>▶</div> <div>▶</div> <div>■</div> <div>🔍</div> <div>🖨</div> </div> <div> <div>Read</div> <div>Selected</div> <div>Total</div> <div>Σ</div> </div> <div> <div>13</div> <div>6</div> <div>13</div> <div>100</div> </div> </div> <div> <div>Page</div> <div>1 of 1</div> </div>					
<u>BANDED GCWAs PER TRAINING AREA</u>					
<u>Training Area</u>	<u>Band Number</u>	<u>Upper Left</u>	<u>Lower Left</u>	<u>Upper Right</u>	<u>Lower Right</u>
10	2040-04684	WH	BL	OR	SI
Total for Tr Area 10 : 1					
13B	2040-03121	RD	YE	GR	SI
Total for Tr Area 13B: 1					
22	2040-03126	NB	BK	BL	SI
22	2040-05731	YE	LA	BK	SI
Total for Tr Area 22 : 2					
87	2040-02421	LA	BK	RD	SI
87	2040-03294	BL	MG	YE	SI

Figure 11. Banded GCWAs per training area.

for each training area. To return to the data entry form, tap the control box in the upper left hand corner of the screen. Tap the Close option and the data entry form will reappear.

d. Cancel an action

Tap **Cancel** to break out of an action. If you're adding a new record, the fields will clear and the database pointer will point to the last record in the database. If you've edited a record, all changes will be disregarded and you will no longer be in edit mode. The database pointer, however, will still point to the record. If you are scrolling through the database and examining the comments of a particular record, tapping **Cancel** will make the comments box disappear, double tapping will not.

e. Save a record

To save a new record or one that has been edited, tap the **Save** button. A new record will be appended to the end of the database. An edited record will retain its position in the database.



f. Swap databases

To switch between databases, tap . The program will ask you which bird database you'd like to switch to. Write in BCVI or GCWA or OTHER if you don't want black-capped vireo or golden-cheeked warbler. Tap  and the program will switch databases accordingly. Keep in mind that you must enter bird data consistent with its own database. For example, only black-capped vireo data can be entered or accessed in the BCVI\_BND database and only golden-cheeked warbler data can be entered or accessed in the GCWA\_BND database and neither can be accessed in the BAND\_DB database.

g. Exit the program

To exit the program, tap . All files are closed.

## 4 Brown-Headed Cowbird Banding Program

(BHCO\_BND.MAK)

### 4.1 General Description

The BHCO Banding program functions the same way as the Banding Survey program except that it records banding and location data on unbanded Brown-Headed Cowbirds and Loggerhead Shrikes. The program will not save records on any other birds. The records are stored in a DBase IV database file using the path name: **C:\VB\BAND\_SRV\BHCO\_BND.DBF**. The field names and descriptions of this file are given below. Data types and data lengths are given in parentheses.

**REC\_NUMBER** (string) (4) - Number of the record in the database.

**DATE** (string) (8) - Current date.

**OBSERVER** (string) (3) - Observer's initials.

**BAND** (string) (4) - Band number prefix.

**NUMBER** (string) (5) - Band number suffix.

**BAND\_STAT** (string) (1) - Status of leg band.

**STAT\_CODE** (string) (3) - Category of banding detail given to a bird.

**SPECIES** (string) (4) - Species code.

**SP\_NUMBER** (string) (4) - A unique 4 digit code representing a bird species. The program will automatically insert this number into the record based on your entry in the SPECIES field.

**AGE\_CODE** (string) (1) - A one digit code representing a bird's age. The program will automatically insert the correct code into the record based on your entry in the AGE field.

0 - Unknown

1 - AHY

2 - HY

4 - L

5 - SY

6 - ASY

**AGE** (string) (3) - Age of bird.

**SEX** (string) (1) - Sex of bird.

**UP\_LEFT** (string) (2) - Color code representing the upper left leg band of a banded bird.

**LOW\_LEFT** (string) (2) - Color code representing the lower left leg band of a banded bird.

**UP\_RIGHT** (string) (2) - Color code representing the upper right leg band of a banded bird.

**LOW\_RIGHT** (string) (2) - Color code representing the lower right leg band of a banded bird.

**REGION** (string) (4) - Designated region of Fort Hood. The program will automatically insert the correct region into the record based on your entry in the TR\_AREA field.

**TRAP\_NAME** (string) (4) - Name of trap.

**TR\_AREA** (string) (4) - Training Area.

**EASTING** (string) (6) - Easting coordinate.

**NORTHING** (string) (3) - Northing coordinate.

**COMMENTS** (string) (150) - Any important notes.

## 4.2 Starting the Program

To start the program, double tap the BHCO\_BND icon with the pen. After typing in your initials, the data entry form will appear as in Figure 12.

USACERL

**BHCO BANDING** 1489

*Required Data*

Date 08/14/95 Observer SM

Species BHCO Sex 4 FWS Band 0

Band 1521 Age ASY Status Code 300

Number 93541

*Location*

Trap Name COHO

Training Area CANT

Easting 192

Northing 468

*Comments*

Record 1489 of 1489

New Edit Summary

Cancel Save Exit

Figure 12. BHCO banding data entry form.

Once started, the information displayed on the form (assuming the database is not empty) is the last record in the database. The total number of records in the database is shown at the bottom left corner of the form. The number at the top right corner indicates the number of the individual record in the database. From here, you can add, edit, or view any record in the database.

## 4.3 Program Flow

### a. Add a new record

To add a new record, tap the **New** button. All fields are cleared out except for observer, record number, sex, FWS band, and status code, which are all assigned default values. You can change the default observer initials by double tapping on the observer text box. Only one frame on the form, *Required Data*, is enabled to remind

you that this information must be included on every record. The *Location* frame and Comments box will only be enabled when you enter data for every control in the *Required Data* frame.

Date - Double tap the box to insert the current date. Use the spin button to increment/decrement the date.

Species - Choose a species code from the combo box. The program will not recognize input you write or type. If you select "BHCO," the program will copy the band number suffix from the **last BHCO record** in the database, add one to it, and place the result in the Number text box. It will also copy the trap name, training area, easting, and northing coordinates and insert them into the corresponding text boxes. If you select "LOSH," nothing will be copied.

Band - Write the band number prefix in the text box or accept the default assigned to BHCOs and LOSHs.

Number - Write the band number suffix in the text box or accept the default.

Sex - Choose a sex code from the combo box or accept the default. If you choose "5" (female), a frame containing leg band combo boxes will appear. Choose a color for each leg band and double tap the frame when you're done. The frame will disappear.

Age - Choose an age code from the combo box. Once you have selected a code, the *Location* frame and Comments box will be enabled.

FWS Band - Choose a FWS band status code from the combo box or accept the default.

Status Code - Choose a status code from the combo box or accept the default. If you choose 301, 319, or 325, a frame containing leg band combo boxes will appear. Choose a color for each leg band and double tap the frame when you're done. The frame will disappear.

Trap Name - Choose a trap name from the combo box or accept the default.

Training Area - Write the training area in the text box or accept the default.

Easting - Write the easting coordinate in the text box or accept the default.

Northing - Write the northing coordinate in the text box or accept the default.

Comments - Write any additional notes in the text box.

b. Edit a record

To edit a record, tap the **Edit** button. Figure 13 shows the resulting band number selection form.

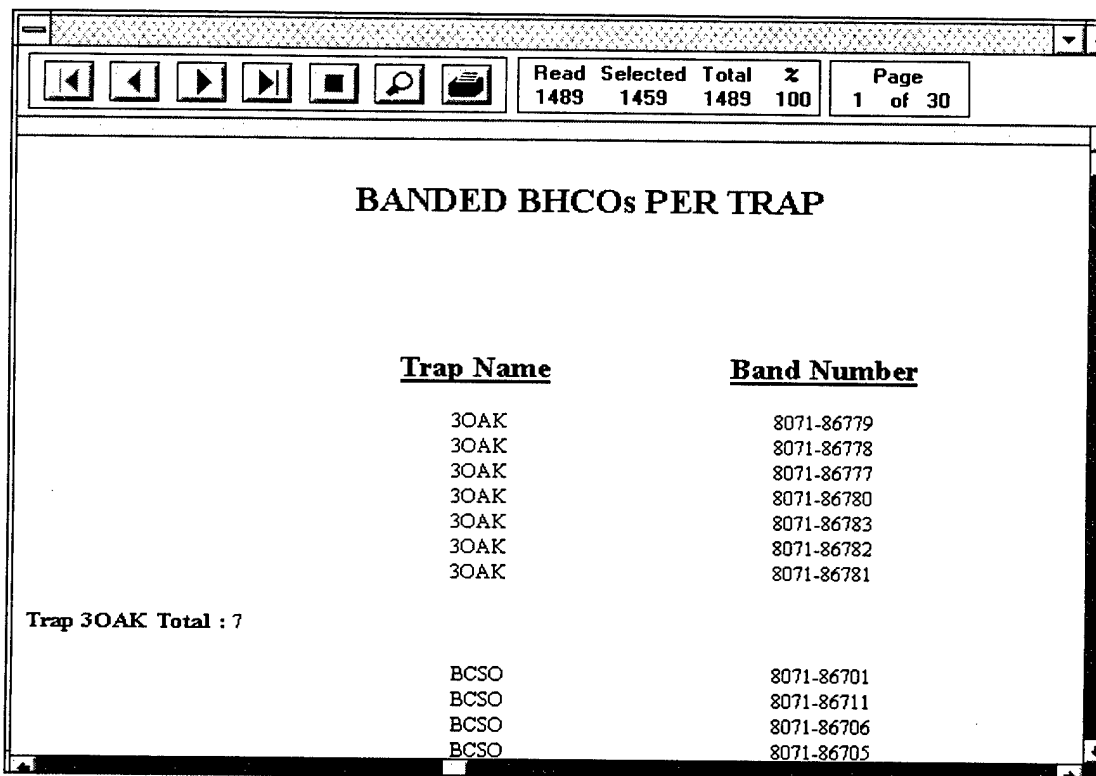
The figure shows a software interface for 'BHCO BANDING' within the 'USACERL' application. The main window has a title bar with 'USACERL' and a record number '1489'. Inside, there's a sidebar with labels: 'Required Data', 'Date', 'Species', 'Band', 'Number', and 'Comments'. The main area is titled 'Select Band Prefix -->' and contains a list box with the following items: 1521, 8061, 8071, and 8081. Below the list box is a 'Cancel' button. At the bottom of the window, there are six buttons: 'New', 'Edit', 'Summary', 'Cancel', 'Save', and 'Exit'. A status bar at the bottom left shows 'Record 1489 of 1489'.

Figure 13. BHCO band selection form.

Tap the band number prefix you want from the list of known prefixes in the database and list of band number suffixes will appear in the same box. Tap the band number suffix you want and the data entry form will reappear displaying the record you wish to edit. If you want to forego the edit process, tap **Cancel** to remove the selection form and bring you back to the data entry form.

### c. Summary

To view a list of all BHCOS banded for each trap, tap **Summary**. The program generates a list of all trap names as well as band numbers of every BHCOS banded. Figure 14 shows an example. To return to the data entry form, tap the control box in the upper left corner of the screen and tap the Close option. The data entry form will reappear.



<u>Trap Name</u>	<u>Band Number</u>
3OAK	8071-86779
3OAK	8071-86778
3OAK	8071-86777
3OAK	8071-86780
3OAK	8071-86783
3OAK	8071-86782
3OAK	8071-86781
Trap 3OAK Total : 7	
BCSO	8071-86701
BCSO	8071-86711
BCSO	8071-86706
BCSO	8071-86705

Figure 14. Banded BHCOS per trap.

### d. Cancel an action

Tap **Cancel** to break out of any action. If you're adding a new record, the fields are cleared and the database pointer will point to the last record in the database. If you've edited a record, all changes will be disregarded and you will no longer be in edit mode. However, the database pointer will still point to the record.

### e. Save a record

To save a new record or one that has been edited, tap the **Save** button. A new record will be appended to the end of the database. An edited record will retain its position in the database.

f. Exit the Program

To exit the program, tap . All files are closed.



## 5 Sightings/Recaptures Program

(SI\_RECAP.MAK)

### 5.1 General Description

The Sightings/Recaptures program records instances of banded black-capped vireos, golden-cheeked warblers, or brown-headed cowbirds returning from previous years. It also records instances where birds are sighted or recaptured in new areas within the same season. The program is structured similar to the Banding Survey program and collects nearly the same data. The records are stored in a DBase IV database file under the path name **C:\VB\SI\_RECAP\SI\_RECAP.DBF**. The field names and descriptions of this file are given below. Data types and lengths are given in parentheses.

**REC\_NUMBER** (string) (4) - Number of the record in the database.

**DATE** (string) (8) - Current date.

**OBSERVER** (string) (3) - Observer's initials.

**MULT\_SIGHT** (string) (4) - Bird sighted and/or recaptured more than once during the current field season. The program will automatically insert "TRUE" if a record for a particular bird already exists in the database.

**METHOD** (string) (5) - Method of detection.

**BAND** (string) (4) - Band number prefix.

**NUMBER** (string) (5) - Band number suffix.

**BAND\_DATE** (string) (8) - Date when bird was originally banded. The program will insert the banding date automatically into the record based on band number or leg band confirmation.

**SPECIES** (string) (4) - Species code.

**AGE** (string) (3) - Age of bird.

**BAND\_AGE** (string) (3) - Age when bird was originally banded. The program will insert the banding age automatically into the record based on band number or leg band confirmation.

**SEX** (string) (1) - Sex of bird.

**UP\_LEFT** (string) (2) - Color code representing the upper left leg band of a banded bird.

**LOW\_LEFT** (string) (2) - Color code representing the lower left leg band of a banded bird.

**UP\_RIGHT** (string) (2) - Color code representing the upper right leg band of a banded bird.

**LOW\_RIGHT** (string) (2) - Color code representing the lower right leg band of a banded bird.

**TR\_AREA** (string) (4) - Training Area.

**EASTING** (string) (6) - Easting coordinate.

**NORTHING** (string) (7) - Northing coordinate.

**ORIG\_TR\_AR** (string) (4) - Training area where bird was first banded. The program will automatically insert the training area into the record based on band number or leg band confirmation.

**ORIG\_EAST** (string) (6) - Easting coordinate where bird was originally banded. The program will automatically insert the easting coordinate into the record based on band number or leg band confirmation.

**ORIG\_NORTH** (string) (7) - Northing coordinate where bird was originally banded. The program will automatically insert the northing coordinate into the record based on band number or leg band confirmation.

**ACTIVITY** (string) (8) - What the bird was doing when sighted or recaptured.

**CP** (string) (2) - Cloacal protuberance.

**BP** (string) (2) - Brood patch.

**CAP\_PLUM** (string) (3) - Cap plumage.

**WING\_LEN** (numeric) (8) - Wing length measurement.

**TAIL\_LEN** (numeric) (8) - Tail length measurement.

**WEIGHT** (numeric) (8) - Weight measurement.

**COMMENTS** (string) (100) - Any important notes.

## 5.2 Starting the Program

To start the program, double tap the Si\_Recap icon with the pen. After typing your initials, the program will ask you to enter the bird species you'll be working with. Accept "BCVI" as the default or write in "GCWA" or "BHCO" for your choice. Tap **OK** and the data entry form shown in Figure 15 will appear.

**USACERL**

# *Sightings/Recaptures*

14

Date: 03/08/96

Observer: SM      Method of Detection: SIGHT      Activity: Singing

**Identification**

Species: BCVI      Confirm band number -> ☐

Band: 2171      Age: ASY

Number: 96601      Sex: 5

**Leg Band**

Upper Left: YE      Upper Right: BL

Lower Left: OR      Lower Right: SI

Confirm band colors -> ☐

**Location**

Training Area: 7      Easting: 659

Northing: 165

**Measurements**

CP:      Wing Length:      BP:      Tail Length:      Cap Plumage:      Weight:     

**Comments**

Record 14 of 14

**Action**

New      Edit      Swap DB

Cancel      Save      Exit

Figure 15. Sightings/recaptures data entry form.

The form looks and acts very much like the Banding Survey program. Once started, the information displayed on the form (assuming the database is not empty) is the last record in the database. The total number of records in the database is shown at the bottom left corner of the form. The number at the top right corner indicates the number of the individual record in the database. From here, you can add, edit, or view any record in the database.

### 5.3 Program Flow

#### a. Add a new record

To add a new record, tap the  button. All fields are cleared out, but default values for observer, species, and record number are inserted.

Date - Double tap the box to insert the current date. Use the spin button to increment/decrement the date.

Method of Detection - This combo box purposely flashes on and off to remind you to make a selection for this field. To stop the flashing, select a choice from the combo box. Choosing "SIGHT" will swap the leg band and identification frames to facilitate data entry as well as disable the *Measurements* frame since no measurements can be taken on a sighted bird. Choosing "RECAP" will enable the *Measurements* frame and set the default values for wing length, tail length, and weight.

Activity - Choose an activity from the combo box.

Band - Choose a band prefix from the combo box. If a band prefix you want doesn't appear in the list, write it in the box.

Number - Write the band suffix in the text box.

Confirm Band Number? - If you're sure of the band number, check this box. The program will automatically search the appropriate database file for that band number and retrieve the sex and leg band colors. The CP combo box will automatically be disabled if the sex is female and the BP combo box will be disabled if the sex is male. Banding date, banding age, original training area, and UTM coordinates will be added when you save the record.

Upper Left - Lower Right - Choose a color code for each leg band from the combo box, if necessary.

Confirm Band Colors? - If you know all four band colors, but don't know the band number, check this box. The program will automatically search the appropriate database file for those band colors and retrieve the sex and band number. Banding date, banding age, original training area, and UTM coordinates will be added when you save the record.

Age - Choose an age code from the combo box.

Training Area - Write the training area in the text box.

Easting - Write the easting coordinate in the text box.

Northing - Write the northing coordinate in the text box.

CP - Choose a CP code from the combo box.

BP - Choose a BP code from the combo box.

Cap/Plum - Choose a code from the combo box.

Wing Length - Use the spin button to increment/decrement the default wing length.

Tail Length - Use the spin button to increment/decrement the default tail length.

Weight - Use the spin button to increment/decrement the default weight by 0.1 grams.

Comments - Tap the  button. In the white space provided, write in whatever comments are necessary. To eliminate the Comments box, double tap it.

b. Edit a record

To edit a record, tap the  button. Figure 16 shows the resulting band number selection form.

USACERL

*Sightings/Recaptures*

Date 03/08/96

Observer

Select Band Prefix --> 1960  
1970  
2171

Cancel

Comments

Record 14 of 14

Action

New Edit Swap DB

Cancel Save Exit

Figure 16. Sightings/Recaptures band number selection form.

This form looks and acts exactly the same as the band selection form in the Banding Survey program. If you want to forego the edit process, tap **Cancel** to remove the selection form and return to the original form. Otherwise, tap the band number prefix you want and a list of band number suffixes will appear in the same box. Tap the band number suffix you want and the original form will reappear displaying the last record matching that band number. You now have access to the entire set of records matching that band number. Use the FIND buttons to view and/or edit those records.

c. Cancel an action

Tap **Cancel** to break out of any action. If you're adding a new record and tap **Cancel**, the fields are cleared and the database pointer will point to the last record in the database. If you've made changes to a record and tap **Cancel**, all changes will be disregarded. You will no longer be in edit mode, but the database pointer will still point to the record.

If you are scrolling through the database and examining the comments of a particular record, tapping  will make the comments screen disappear, double tapping will not.

d. Save a record

To save a new record or one that has been edited, tap the  button. The record will be automatically saved to the database. A new record will be appended to the end of the database. An edited record will retain its position in the database.

e. Swap databases

Tap  when you need to enter data for another species. The program will ask you which species database you'd like to switch to. Write in "GCWA" for golden-cheeked warbler, "BHCO" for brown-headed cowbird or accept "BCVT" as the default. Tap  and the program will switch databases accordingly. Be aware that switching databases only changes the underlying database the program accesses when retrieving banding information. It does not switch the SI\_RECAP.DBF file.

f. Exit the Program

To exit the program, tap . All files are closed.

## 6 Point Count Program

(BIRD\_CNT.MAK)

### 6.1 General Description

The Point Count program records data (i.e., location, bird observations) while conducting point counts. At each designated point, after the count has started, the computer will beep when the allotted 10 minute time limit is over. The program will accommodate new routes, new points, and new observations. The records are stored in a DBase IV database file under the path name **C:\VB\BIRD\_CNT\BIRD\_CNT.DBF**. The field names and descriptions of this file are given below. Data types and field lengths are given in parentheses.

**REC\_NUMBER** (string) (4) - Number of the record in database.

**DATE** (string) (8) - Current date.

**OBSERVER** (string) (3) - Observer's initials.

**SUNRISE** (string) (5) - Time of sunrise.

**TEMP** (string) (3) - Current temperature.

**WIND\_SPEED** (string) (5) - Range of wind speed.

**WIND\_DIR** (string) (2) - Wind direction.

**CLOUD** (string) (3) - Cloud cover.

**ROUTE** (string) (2) - Route number.

**POINT\_NUM** (string) (2) - Point number.

**TR\_AREA** (string) (4) - Training area.

**EASTING** (string) (6) - Easting coordinate.



**NORTHING** (string) (7) - Northing coordinate.

**TYPE** (string) (10) - Community type.

**UNDERSTORY** (string) (8) - Understory thickness.

**TREE\_SPEC** (string) (15) - Most common tree species.

**JUNIPER** (string) (1) - Juniper class.

**START\_TIME** (string) (10) - Start time for 10-minute time limit.

**OBS\_TIME** (string) (10) - Start time for observing a bird.

**SPECIES** (string) (4) - Species code.

**SEX** (string) (1) - Sex of bird.

**CALL** (true/false) (1) - Was a call heard?

**SONG** (true/false) (1) - Was a song heard?

**SONG\_TYPE** (string) (4) - Type of song.

**VISUAL** (true/false) (1) - Was bird seen?

**DIRECTION** (string) (3) - Azimuthal direction.

**EST\_DIST** (numeric) (8) - Estimated distance away from observer.

**FLEDGLINGS** (numeric) (8) - Number of fledglings.

**COMMENTS** (string) (150) - Any important notes.

## 6.2 Starting the Program

To start the program, double tap the Bird\_Cnt icon with the pen. The daily conditions form shown in Figure 17 will appear.

USACERL

## *Ft Hood Bird Count Survey*

Please enter current conditions for today:

**Current Conditions**

Date  Observer  Sunrise  Temp

Cloud Cover  Wind Direction  Wind Speed

**Action**

Figure 17. Daily conditions form.

You need to enter data in this form only at the beginning of the point count. Since these data are entered only once, it is very important to complete all the fields. The data will automatically be added to each record saved to the database. Each field in this initial form is addressed below.

Date - Accept the current date or use the spin button to increment/ decrement the date.

Observer - Write initials in the text box.

Sunrise - Accept the default sunrise time or use the spin button to increment/decrement the time.

Temp - Accept the default temperature or use the spin button to increment/decrement the temperature.

Cloud Cover - Choose cloud cover from the combo box.

Wind Direction - Choose any wind direction from the combo box. If you select a blank space, the program will automatically insert zero for Wind Speed.

Wind Speed - Write wind speed range (i.e., 10-15) in text box.

If you wish to exit the program, tap **Exit**. If you're satisfied with the data you have entered, tap **OK** and the data entry form in Figure 18 will appear. Field data collection can then begin.

**USACERL**

09:40:07 17

**Location**

**Vegetation**

Community SAVANNAH  
 Species LIVE OAK  
 Understory OPEN  
 Juniper 4

Route 26  
 Point Number 3  
 Training Area 1B

Easting 320  
 Northing 596  
 Start 16:33:53

**Observation**

Obs Time 16:34:17  
 Species OCWA  
 Sex F

Type  
 Call ☐  
 Song ☐  
 Visual ☒

Direction 90  
 Estimated Distance 10  
 Fledglings 0

Comments

Record 17 of 17

**Action**

New Route New Point Main Menu  
 Cancel Save Exit

Figure 18. Bird count data entry form.

The information displayed on the form (assuming the database is not empty) is the last record in the database. The total number of records in the database is shown at the lower left corner of the form. The number at the upper right corner indicates the number of the individual record in the database.

## 6.3 Program Flow

### a. Start new route

To start a new route, tap the **New Route** button. All fields are cleared out, but the program inserts a value for the next record number.

Community - Choose a community type from the combo box.

Species - Choose the dominant tree species from the combo box.

Understory - Choose the understory thickness level from the combo box.

Juniper - Choose a juniper class from the combo box.

Route - Use the spin button to increment/decrement the route number or write it in the text box.

Point Number - Use the spin button to increment/decrement the point number or write it in the text box.

Training Area - Tap the text box. By tapping the box, the program will search a location file for a corresponding training area, easting, and northing coordinate matching the route and point number. These values will be placed in the appropriate text boxes.

Easting - No need for action. Data automatically inserted.

Northing - No need for action. Data automatically inserted.

Start - Tap the  button to begin the 10 minute time limit.

Observation Time - Tap the  button to record the time you observed a bird.

Species - Choose a species code from the combo box or write it in.

Sex - Choose a sex code from the combo box.

Call - Tap the box if you heard a bird call.

Song - Tap the box if you heard a bird singing. If the observed bird is a GCWA, choose a song name from the list box.

Visual - Tap the box if you saw the bird.

Direction - Use the spin button to increment/decrement the azimuthal direction by 5 degrees or write it in the text box.

Estimated Distance - Use the spin button to increment/decrement the distance by 5 degrees or write it in the text box.

Fledglings - Use the spin button to increment/decrement the number of fledglings or write it in the text box.

Comments - Tap the  button. In the white space provided, write whatever comments are necessary. To eliminate the Comments box, double tap it.

b. Start new point number

To record a new point number, you must already have a route established, otherwise an error will occur. Tap the  button and all fields are cleared out except for route number. That value is carried forward from the initial new route entry. Continue entering data following the same guidelines as new route number.

c. Start new observation

To record a new observation, you must already have a route and point number established. When these conditions are met, the  button will replace the  button. Tap it and all fields in the *Observation* frame will clear except the observed time text box, which displays the beginning observation time. All values in the *Location* frame are carried forward from the last entry. Continue entering data following the same guidelines as new route number.

d. Edit a record

To edit a record, make sure all fields on the daily conditions form contain values and then tap . Figure 19 shows the resulting selection list box.

If you want to forego the edit process, tap the  button. Otherwise, tap the route you want and an associated list of point numbers will appear in the same box. Tap the point number you want and the data entry form will reappear displaying the last record matching that route and point number. You now have access to the entire set of records matching that route and point number. Use the FIND buttons to view and/or edit those records.

USACERL

## Ft Hood Bird Count Survey

Select a route ->

**Current Conditions**

Date: 04/03/96    Observer: SM    Time: 06:45    Temp: 65

Cloud Cover: CLR    Wind Direction:    Wind Speed: 0

**Action**

OK    Cancel    Edit    Exit

Figure 19. Bird count selection list box.

e. Cancel an action

Tap **Cancel** to break out of any action. If you're adding a new route, point, or observation, the fields will clear and the database pointer will point to the last record in the database. Be careful using this button. Tapping **Cancel** requires you to re-establish a route before you can add a new point or observation. If you've made changes to a record and tap **Cancel**, all changes will be disregarded and you will no longer be in edit mode. The database pointer will still point to the same record.

If you're scrolling through the database and examining the comments of a particular record, tapping **Cancel** will make the comments box disappear, double tapping the box will not.

f. Save a record

To save a new record or one that has been edited, tap the **Save** button. The record will be automatically saved to the database. A new record will be appended to the end of the database. An edited record will retain its position in the database.

g. Exit the program

To exit the program, tap . All files are closed.

## 7 Brown-Headed Cowbird Trapping Program

(BHCO\_TRP.MAK)

### 7.1 General Description

The Cowbird Trapping program collects data on trapped cowbirds. It accumulates the number of dead and released cowbirds as well as non-target species. Additional features include calendar and FWS yearly total print outs and monthly trap totals including trapping efficiency. To print a copy of the totals, you must have a printer (such as the Fujitsu DL2400) connected to the computer using a parallel cable. The records are stored in a DBase IV database file under the path name **C:\VB\BHCO\_TRP\BHCO\_TRP.DBF**. The field names and descriptions of this file are given below. Data types and lengths are given in parentheses.

**REC\_NUMBER** (string) (4) - Number of the record in database.

**DATE** (date/time) (8) - Current date.

**MONTH** (string) (2) - Current month.

**DAY** (string) (2) - Current day.

**YEAR** (string) (2) - Current year.

**OBSERVER** (string) (3) - Observer's initials.

**TRAP\_NAME** (string) (4) - Name of trap.

**TRAP\_TYPE** (string) (10) - Type of trap.

**TRAP\_STAT** (string) (6) - Trap status.

**REGION** (string) (4) - Designated region of Fort Hood.

**TR\_AREA** (string) (4) - Training area.



**EASTING** (string) (6) - Easting coordinate.

**NORTHING** (string) (7) - Northing coordinate.

**M\_ADDED** (numeric) (8) - Number of male cowbirds added to a trap.

**F\_ADDED** (numeric) (8) - Number of female cowbirds added to a trap.

**I\_ADDED** (numeric) (8) - Number of immature cowbirds added to a trap.

**M\_KILLED** (numeric) (8) - Number of male cowbirds killed.

**F\_KILLED** (numeric) (8) - Number of female cowbirds killed.

**I\_KILLED** (numeric) (8) - Number of immature cowbirds killed.

**M\_RELEASED** (numeric) (8) - Number of male cowbirds released.

**F\_RELEASED** (numeric) (8) - Number of female cowbirds released.

**I\_RELEASED** (numeric) (8) - Number of immature cowbirds released.

**M\_TOTAL** (numeric) (8) - Number of male cowbirds killed and released.

**F\_TOTAL** (numeric) (8) - Number of female cowbirds killed and released.

**I\_TOTAL** (numeric) (8) - Number of immature cowbirds killed and released.

**N\_TRG\_REL** (numeric) (8) - Number of non-target species released.

**N\_TRG\_DEAD** (numeric) (8) - Number of non-target species dead.

**COMMENTS** (string) (100) - Any important notes.

## 7.2 Starting the Program

To start the program, double tap the BHCO icon with the pen. After writing your initials in the box, the main menu form in Figure 20 will appear. This menu is divided into two boxes: one box for summarizing data and a second box for adding and editing records.

USACERL

**COWBIRD TRAPPING PROGRAM**

Summary

Summary by trap -> **Trap**

Summary by FWS year -> **FW\_Year**

Summary by calendar year -> **Cal\_Year**

Action

Add new trap name -> **Add New Trap**

Add a trap record -> **Add Record**

Edit a trap record -> **Edit Record**

Exit from program -> **Exit**

Figure 20. Cowbird trapping main menu.

### 7.3 Program Flow

a. Add a new trap

To add a new trap to the database, tap the **Add New Trap** button. The main menu form will disappear and the new trap form shown in Figure 21 will appear.

All fields are cleared out, but the program will insert default values for current date, observer initials, and record number. You can increment or decrement the current date by tapping the spin button.

Trap Name - Write the name of the trap in the text box.

Type - Choose a type of trap from the combo box.

Region - Choose a region code from the combo box.

Training Area - Write the training area in the text box.

USACERL

Date 04/03/96 Observer SM 17

**Trap Information**

Trap Name

Type

Region

Training Area

Easting

Northing

Added

Male 0

Female 0

Immature 0

Comments

Save Cancel Main Menu

Figure 21. New trap form.

Easting - Write the easting coordinate in the text box.

Northing - Write the northing coordinate in the text box.

Males Added - Use the spin button to increment/decrement the number of males added or write it in the text box.

Females Added - Use the spin button to increment/decrement the number of females added or write it in the text box.

Immatures Added - Use the spin button to increment/decrement the number of immatures added or write it in the text box.

Comments - Write any pertinent comments in the text box.

Tap the **Save** button to save the record to the database. The program will automatically check to see if the trap name already exists in the database. If it does, a warning message will appear on the screen. You can ignore the message and continue, or accept it and re-enter a different trap name. Tap the **Cancel** button

to clear out all the fields and start over. Tap the **Main Menu** button to remove the new trap form and return to the main menu.

b. Add a new record

To record a new observation, tap the **Add Record** button. A list box will appear on the form containing all trap names in the database. Figure 22 shows an example.

Figure 22. Cowbird trappings selection list box.

Tap the trap name you want and the main menu form will be removed while the new record form will appear. To cancel your request, tap the **Cancel** button. Figure 23 shows the resulting new record form.

The top part of the form shows the *Trap Location* frame, which contains location information that wouldn't normally change. It is shown for reference. Date, observer, and record number fields have default values automatically inserted. You need to enter data only in the lower portion of the form.

**Trap re-opened/closed** - Because these two option buttons are grouped into one frame, only one may be selected, not both. Select either one **only when**

HOME					
Date	04/03/96	Trap Location			
Observer	SM	Trap Name	HOME	Training Area	6
		Easting	239	Northing	871
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <div style="border-bottom: 1px solid black; padding-bottom: 5px;">17</div> <div>Trap Status</div> <div>Trap (re)opened --&gt; <input type="radio"/></div> <div>Trap closed --&gt; <input type="radio"/></div> </div> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <div>Killed</div> <div>Male 0</div> <div>Female 0</div> <div>Immature 0</div> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <div>Released</div> <div>Male 0</div> <div>Female 0</div> <div>Immature 0</div> </div> <div style="border: 1px solid black; padding: 5px;"> <div>Total</div> <div>Male 0</div> <div>Female 0</div> <div>Immature 0</div> </div> </div> <div style="width: 55%;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <div>Comments</div> <div style="border-bottom: 1px solid black; height: 20px; margin-top: 5px;"></div> </div> <div style="border: 1px solid black; padding: 5px;"> <div>Action</div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span>Cancel</span> <span>Save</span> <span>New Record</span> <span>Main Menu</span> </div> </div> </div> </div> </div> </div>					

Figure 23. New record form.

**necessary.** If you select "Trap re-opened," all frames in the lower portion disappear and the *Added* frame takes their place. Use the spin button to increment the number of males, females, and immatures added to the trap.

Number Released - Use the spin button to increment/decrement the number of non-target species released or write it in the text box.

Number Dead - Use the spin button to increment/decrement the number of non-target species dead or write it in the text box.

Males Killed - Use the spin button to increment/decrement the number of males killed or write it in the text box.

Females Killed - Use the spin button to increment/decrement the number of females killed or write it in the text box.

Immatures Killed - Use the spin button to increment/decrement the number of immatures killed or write it in the text box.

Males Released - Use the spin button to increment/decrement the number of males released or write it in the text box.

Females Released - Use the spin button to increment/decrement the number of females released or write it in the text box.

Immatures Released - Use the spin button to increment/decrement the number of immatures released or write it in the text box.

Total - Tap the  button to sum up the number of male, female, and immature cowbirds killed and released.

Comments - Tap the  button. In the white space provided, write any pertinent comments. To eliminate the Comments box, double tap it.

Tap the  button to save the record to the database. Tap the  button to clear out all fields and remain at the last database record. To add another record, tap the  button. In doing so, a list box will appear containing all trap names. Choose a trap name to enter another record. Tap the  button to remove the new record form and return to the main menu.

c. Edit a record

To edit a record, tap the  button. The same list box containing all trap names in the database appears exactly as adding a new record. Refer to Figure 22 for that example. If you want to forego the edit process, tap the  button. Otherwise, tap the trap name you want and the edit record form will appear displaying the last record matching that trap name. You now have access to all records matching that trap name. Figure 24 shows the resulting edit record form.

The text box in the upper left shows the individual record number in the database. The text box in the lower left corner shows how many records belong to the selected trap name. The edit record form functions the same way as the new record form and looks the same, except the edit record form has a frame containing FIND buttons. Use the FIND buttons to view and/or edit those records.

Except for the location frame in the top part of the form, all data fields are available to edit. Tap  to save your changes to the database. Tap  to nullify any changes made. After tapping either button, you can scroll through the database

**HOME**

Date: 03/18/96

Observer: SM

Trap Location: Trap Name: EPEN Training Area: 12 Easting: 786 Northing: 211

5

**Trap Status**  
 Trap (re)opened → ☒  
 Trap closed → ☐

**Non-Targets**  
 Number Dead: 3  
 Number Released: 3

**Find Record**  
 Find First Find Next  
 Find Prev Find Last

**Killed**  
 Male: 3  
 Female: 3  
 Immature: 3

**Released**  
 Male: 3  
 Female: 0  
 Immature: 3

**Total**  
 Male: 6  
 Total Female: 3  
 Immature: 6

**Comments**  
 Record 2 of 2

**Action**  
 Cancel Save New Record Main Menu

Figure 24. Edit record form.

and view any record. Tap **New Record** to add a new record to the database. Tap **Main Menu** to remove the edit record form and return the main menu form.

#### d. Summary by Trap

To get any trap summary, including trapping efficiency, tap the **Trap** button. The same list box containing all trap names in the database will appear exactly as adding a new record or editing an existing record. Refer to Figure 22 for that example. Tap the trap name you want and the program will ask you for a start date. Write in the starting date for the summary. The program will then ask you for a stop date. The default will be the last day of the starting month. Write in a different date if you want to change it. Choose the default or write in a different date to display a summary of killed and released cowbirds with an overall trapping efficiency for that time period. Tap **Cancel** to cancel your request. Figure 25 shows an example.

To print a copy of this table, tap the **Print** button. To remove this table and return to the main menu, tap **Main Menu**.

USACERL					
BHCO Trap Summary for LOC1					
Males killed	7	Males released	19	Males killed and released	26
Females killed	35	Females released	0	Females killed and released	35
Immatures killed	15	Immatures released	2	Immatures killed and released	17
Total killed		57	Total released		21
			Total killed and released		78
Trap Days = 37					
Trapping Efficiency = 94.59%					
Print			Main Menu		

Figure 25. Trap summary.

## e. Summary by Year

If you want a collective summary of all traps over a given year, the cowbird trapping program gives you two choices: FWS year or calendar year. FWS year prints a combined trap summary from December to the following November. To view it, tap **FW\_Year**. Calendar year prints a combined summary of traps from January to December. To view that, tap **Cal\_Year**. No matter which you choose, each will prompt you for a particular year. The default will always be the current year. Choosing the default or writing in a different year will bring up the summary table for that particular year. Figures 26 and 27 show an example of each.

To print a copy of any of these tables, make sure the printer is turned on and tap the **Print** button. To remove or get out of any table and return to the main menu, tap **Main Menu**.

## f. Exit the Program

To exit the program, tap **Exit**. All files are closed.



USACERL									
<b>BHCO Trapping Summary for FWS 1995</b>									
	Males Killed	Females Killed	Immatures Killed	Males Released	Females Released	Immatures Released	Male Total	Female Total	Immature Total
Jan 1995	7	18	6	4	0	5	11	18	11
Feb	7	16	8	7	0	2	14	16	10
Mar	0	19	7	12	0	0	12	19	7
Apr	2	19	6	9	0	0	11	19	6
May	5	10	5	1	0	1	6	10	6
Jun	0	0	0	0	0	0	0	0	0
Jul	0	0	0	0	0	0	0	0	0
Aug	0	0	0	0	0	0	0	0	0
Sep	0	0	0	0	0	0	0	0	0
Oct	0	0	0	0	0	0	0	0	0
Nov	0	0	0	0	0	0	0	0	0
Dec 1994	3	1	2	1	0	1	4	1	3
<b>Totals</b>	<b>26</b>	<b>63</b>	<b>28</b>	<b>24</b>	<b>0</b>	<b>8</b>	<b>41</b>	<b>64</b>	<b>20</b>
<div> <div>Print</div> <div>Main Menu</div> </div>									

Figure 26. FWS year summary.

USACERL									
<b>BHCO Trapping Summary for 1995</b>									
	Males Killed	Females Killed	Immatures Killed	Males Released	Females Released	Immatures Released	Male Total	Female Total	Immature Total
Jan 1995	7	18	6	4	0	5	11	18	11
Feb	7	16	8	7	0	2	14	16	10
Mar	0	19	7	12	0	0	12	19	7
Apr	2	19	6	9	0	0	11	19	6
May	5	10	5	1	0	1	6	10	6
Jun	0	0	0	0	0	0	0	0	0
Jul	0	0	0	0	0	0	0	0	0
Aug	0	0	0	0	0	0	0	0	0
Sep	0	0	0	0	0	0	0	0	0
Oct	0	0	0	0	0	0	0	0	0
Nov	0	0	0	0	0	0	0	0	0
Dec	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>26</b>	<b>63</b>	<b>28</b>	<b>24</b>	<b>0</b>	<b>8</b>	<b>41</b>	<b>64</b>	<b>20</b>
<div> <div>Print</div> <div>Main Menu</div> </div>									

Figure 27. Calendar summary.

## 8 Non-Target Species Program

(NON\_TARG.MAK)

### 8.1 General Description

The non-target species program is an offshoot of the cowbird trapping program. The non-target species program accumulates the number of non-target birds killed in and released from cowbird traps. It also records what species they were. The records are stored in a DBase IV database file under the path name **C:\VB\NON\_TARG\NON\_TARG.DBF**. The field names and descriptions of this file are given below. Data types and lengths are given in parentheses.

**REC\_NUMBER** (string) (4) - Number of the record in database.

**DATE** (string) (8) - Current date.

**OBSERVER** (string) (3) - Observer's initials.

**TRAP\_NAME** (string) (4) - Name of trap.

**AMKE\_REL** (numeric) (8) - Number of American Kestrels released.

**BEWR\_REL** (numeric) (8) - Number of Bewick's Wrens released.

**BLJA\_REL** (numeric) (8) - Number of Blue Jays released.

**BRBL\_REL** (numeric) (8) - Number of Brewer's Blackbirds released.

**BROC\_REL** (numeric) (8) - Number of Bronzed Cowbirds released.

**CASP\_REL** (numeric) (8) - Number of Cassin's Sparrows released.

**COGR\_REL** (numeric) (8) - Number of Common Grackles released.

**DOWO\_REL** (numeric) (8) - Number of Downy Woodpeckers released.

**EABL\_REL** (numeric) (8) - Number of Eastern Bluebirds released.

**EAPH\_REL** (numeric) (8) - Number of Eastern Phoebe released.

**FISP\_REL** (numeric) (8) - Number of Field Sparrows released.

**HASP\_REL** (numeric) (8) - Number of Harris' Sparrows released.

**HOFI\_REL** (numeric) (8) - Number of House Finches released.

**LASP\_REL** (numeric) (8) - Number of Lark Sparrows released.

**LOSH\_REL** (numeric) (8) - Number of Loggerhead Shrikes released.

**MODO\_REL** (numeric) (8) - Number of Mourning Doves released.

**NOCA\_REL** (numeric) (8) - Number of Northern Cardinals released.

**NOMO\_REL** (numeric) (8) - Number of Northern Mockingbirds released.

**RBWO\_REL** (numeric) (8) - Number of Red-Bellied Woodpeckers released.

**RCSP\_REL** (numeric) (8) - Number of Rufous-Crowned Sparrows released.

**RWBL\_REL** (numeric) (8) - Number of Red-Winged Blackbirds released.

**SHCO\_REL** (numeric) (8) - Number of Shiny Cowbirds released.

**SSHA\_REL** (numeric) (8) - Number of Sharp-Shinned Hawks released.

**STFL\_REL** (numeric) (8) - Number of Scissor-Tailed Flycatchers released.

**WCSP\_REL** (numeric) (8) - Number of White-Crowned Sparrows released.

**WEKI\_REL** (numeric) (8) - Number of Western Kingbirds released.

**YHBL\_REL** (numeric) (8) - Number of Yellow-Headed Blackbirds released.

**AMKE\_DEAD** (numeric) (8) - Number of American Kestrels dead.

**BEWR\_DEAD** (numeric) (8) - Number of Bewick's Wrens dead.

**BLJA\_DEAD** (numeric) (8) - Number of Blue Jays dead.

**BRBL\_DEAD** (numeric) (8) - Number of Brewer's Blackbirds dead.

**BROC\_DEAD** (numeric) (8) - Number of Bronzed Cowbirds dead.

**CASP\_DEAD** (numeric) (8) - Number of Cassin's Sparrows dead.

**COGR\_DEAD** (numeric) (8) - Number of Common Grackles dead.

**DOWO\_DEAD** (numeric) (8) - Number of Downy Woodpeckers dead.

**EABL\_DEAD** (numeric) (8) - Number of Eastern Bluebirds dead.

**EAPH\_DEAD** (numeric) (8) - Number of Eastern Phoebes dead.

**FISP\_DEAD** (numeric) (8) - Number of Field Sparrows dead.

**HASP\_DEAD** (numeric) (8) - Number of Harris' Sparrows dead.

**HOFI\_DEAD** (numeric) (8) - Number of House Finches dead.

**LASP\_DEAD** (numeric) (8) - Number of Lark Sparrows dead.

**LOSH\_DEAD** (numeric) (8) - Number of Loggerhead Shrikes dead.

**MODO\_DEAD** (numeric) (8) - Number of Mourning Doves dead.

**NOCA\_DEAD** (numeric) (8) - Number of Northern Cardinals dead.

**NOMO\_DEAD** (numeric) (8) - Number of Northern Mockingbirds dead.

**RBWO\_DEAD** (numeric) (8) - Number of Red-Bellied Woodpeckers dead.

**RCSP\_DEAD** (numeric) (8) - Number of Rufous-Crowned Sparrows dead.

**RWBL\_DEAD** (numeric) (8) - Number of Red-Winged Blackbirds dead.

**SHCO\_DEAD** (numeric) (8) - Number of Shiny Cowbirds dead.

**SSHA\_DEAD** (numeric) (8) - Number of Sharp-Shinned Hawks dead.

**STFC\_DEAD** (numeric) (8) - Number of Scissor-Tailed Flycatchers dead.

**WCSP\_DEAD** (numeric) (8) - Number of White-Crowned Sparrows dead.

**WEKI\_DEAD** (numeric) (8) - Number of Western Kingbirds dead.

**YHBL\_DEAD** (numeric) (8) - Number of Yellow-Headed Blackbirds dead.

**COMMENTS** (string) (150) - Any important notes.

## 8.2 Starting the Program

To start the program, double tap the Non\_Targ icon with the pen. After writing your initials in the box, the main menu form in Figure 28 will appear.

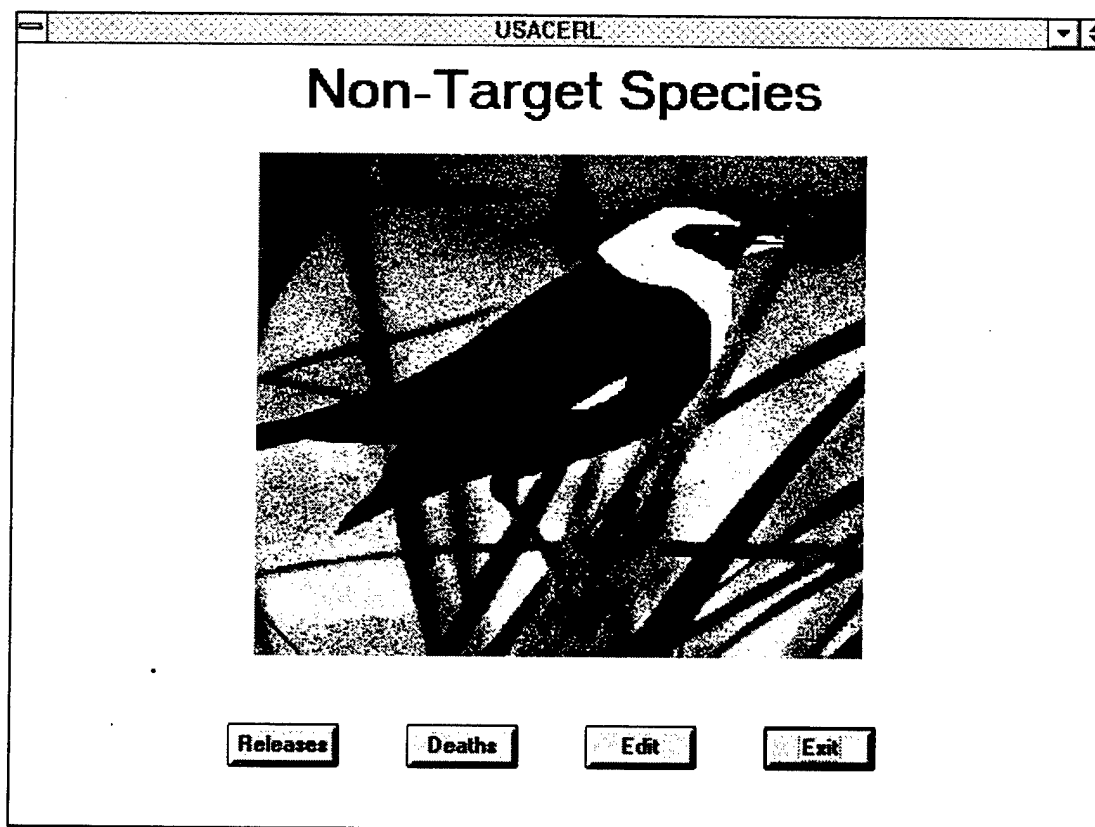


Figure 28. Non-target species main menu.

### 8.3 Program Flow

#### a. Add a Non-Target Species

To record non-target releases and/or non-target deaths, tap either the **Releases** or **Deaths** button. A box will appear prompting you to enter the current date. Accept the default current date or write in a different date and tap **OK**. If you wish to cancel your request, tap **Cancel**. After tapping **OK**, a list box containing all cowbird trap names will appear as shown in Figure 29.

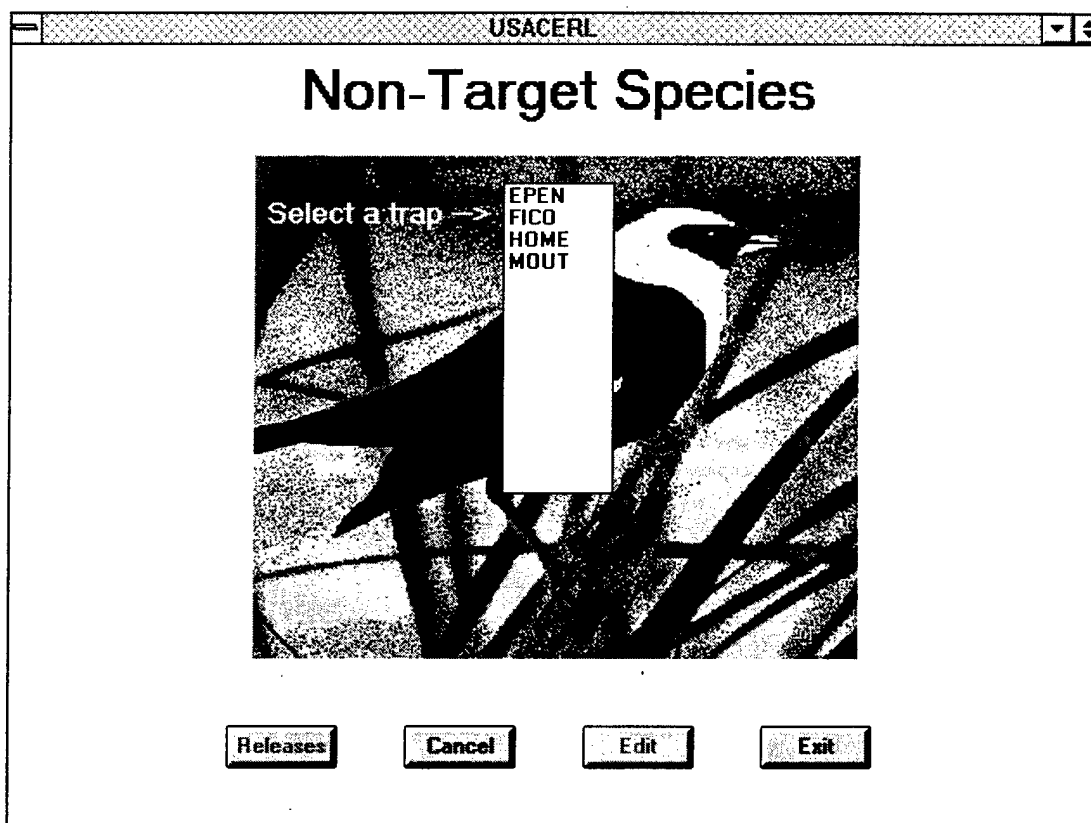


Figure 29. Selecting a trap name.

Tap **Cancel** to cancel your request or tap the trap name you want and the data entry form will appear. Figure 30 shows an example of the data entry form.

Both releases and deaths use the same data entry form. For all data fields, use the spin buttons to increment/decrement the counter or write the number in the text box. If you're done entering data for released birds and want to enter data for non-target deaths, tap the **Deaths** button. If you're done entering data for dead birds and want to enter data for non-target releases, tap the **Releases** button. Tapping either button will only change the field names and the title bar, but everything else

Non-Target Deaths from FICO

AMKE Dead 0	BEWR Dead 0	BLJA Dead 0	BRBL Dead 0	BROD Dead 0
CASP Dead 0	COGR Dead 0	DOWD Dead 0	EABL Dead 0	EAPH Dead 0
FISP Dead 0	HASP Dead 0	HOFI Dead 0	LASP Dead 0	LOSH Dead 0
MODO Dead 0	NOCA Dead 0	NOMO Dead 0	RBWO Dead 0	RCSP Dead 0
RWBL Dead 0	SHCO Dead 0	SSHA Dead 0	STFL Dead 0	WCSP Dead 0
WEKI Dead 0	YHBL Dead 0			

Releases Comments Save Main Menu

Figure 30. Non-target species data entry form.

stays the same. As such, the procedure for entering data is the same. Tap the **Comments** button to write any pertinent comments in the white space provided.

When all data have been entered, tap **Save** to save the record to the database. Both non-target releases and deaths will be saved. Tapping **Main Menu** will remove the data entry form and return you to the main menu.

#### b. Edit a record

To edit a record, tap the **Edit** button. A list box containing all trap names in the non-target database will appear. Select the trap you wish to edit and the program will ask if you want to edit non-target deaths. Tap **Yes** if you want to edit non-target deaths or tap **No** if you want to edit non-target releases. Tap **Cancel** if you wish to return to the main menu. The resulting edit form is shown in Figure 31.

The same edit form is used for non-target deaths as well as non-target releases. The only difference is the labels. Tap **Releases** or **Deaths** to toggle between both. The text box in the lower left hand corner shows how many records belong to a particular trap. Use the FIND buttons to view and/or edit those records. Tap

Non-Target Releases from COPE				
AMKE Release 0	BEWR Release 0	BLJA Release 1	BRBL Release 0	BROC Release 0
CASP Release 0	COGR Release 0	DOWD Release 0	EABL Release 0	EAPH Release 0
FISP Release 0	HASP Release 0	HOFI Release 0	LASP Release 0	LOSH Release 0
MODO Release 0	NOCA Release 0	NOMD Release 0	RBWO Release 0	RCSP Release 0
RWBL Release 0	SHCO Release 0	SSHA Release 0	STFL Release 0	WCSP Release 0
WEKI Release 1	<div>Find</div> <div>Find First Find Prev Find Next Find Last</div>			YHBL Release 2
Record 3 of 3		Deaths	Comments	Save Main Menu

Figure 31. Non-target species edit form.

Tap **Save** to save your changes to the database. Tap **Main Menu** to remove the edit form and return to the main menu form.

c. Exit the Program

Tap **Exit** from the main menu to exit the program. All files are closed.



## 9 Black-Capped Vireo Survey

(BCVI.MAK)

### 9.1 General Description

The Black-Capped Vireo program records location and nesting data on known BCVI territories. Information can also be recorded for suspected territories where the nest is never found. When you save the data, the data are stored in a DBase IV database file under the path name **C:\VB\BCVI\BCVI.DBF**. The field names and descriptions of this file are given below. Data types and lengths are given in parentheses.

**REC\_NUMBER** (string) (4) - Number of record in the database.

**ID** (string) (7) - Unique code for each BCVI territory. Composed of training area and territory. The program automatically inserts ID with every new record.

**DATE** (string) (8) - Current date.

**START** (string) (5) - Start time of observation.

**STOP** (string) (5) - Stop time of observation.

**MINUTES** (numeric) (8) - The difference between start and stop times in minutes. The program automatically calculates and inserts this field into the record.

**OBSERVER** (string) (3) - Observer's initials.

**REGION** (string) (4) - Designated region of Fort Hood. The program will automatically insert the correct region into the record based on your entry in the **TR\_AREA** field.

**ORIG\_TR\_AR** (string) (4) - Training area where bird was first banded.

**TR\_AREA** (string) (4) - Current training area.

**TERRITORY** (string) (2) - Territory number within a training area.

**EASTING** (string) (6) - Easting coordinate.

**NORTHING** (string) (7) - Northing coordinate.

**AERIAL** (string) (3) - Aerial photo number.

**MATED** (true/false) (1) - Was the male mated?

**M\_CONFIRM** (true/false) (1) - Was the male visually confirmed?

**M\_BAND** (string) (4) - Band number prefix of male. The program automatically inserts this when band colors are confirmed.

**M\_NUMBER** (string) (5) - Band number suffix of male. The program automatically inserts this when band colors are confirmed.

**M\_BAND\_DAT** (string) (8) - Date when male was originally banded. The program automatically inserts this when band colors are confirmed.

**M\_BAND\_AGE** (string) (3) - Age when male was originally banded. The program automatically inserts this when band colors are confirmed.

**M\_CURR\_AGE** (string) (3) - Current age of male.

**MU\_LEFT** (string) (2) - Color code representing the upper left leg band of a male banded bird.

**ML\_LEFT** (string) (2) - Color code representing the lower left leg band of a male banded bird.

**MU\_RIGHT** (string) (2) - Color code representing the upper right leg band of a male banded bird.

**ML\_RIGHT** (string) (2) - Color code representing the lower right leg band of a male banded bird.

**F\_CONFIRM** (true/false) (1) - Was female visually confirmed?

**F\_\_BAND** (string) (4) - Band number prefix of female. The program automatically inserts this when band colors are confirmed.

**F\_NUMBER** (string) (5) - Band number suffix of female. The program automatically inserts this when band colors are confirmed.

**F\_BAND\_DAT** (string) (8) - Date when female was originally banded. The program automatically inserts this when band colors are confirmed.

**F\_BAND\_AGE** (string) (3) - Age when female was originally banded. The program automatically inserts this when band colors are confirmed.

**F\_CURR\_AGE** (string) (3) - Current age of female.

**FU\_LEFT** (string) (2) - Color code representing the upper left leg band of a female banded bird.

**FL\_LEFT** (string) (2) - Color code representing the lower left leg band of a female banded bird.

**FU\_RIGHT** (string) (2) - Color code representing the upper right leg band of a female banded bird.

**FL\_RIGHT** (string) (2) - Color code representing the lower right leg band of a female banded bird.

**NO\_NEST** (True/False) (1) - No nest was observed but nesting evidence was found.

**NEST\_ATMPT** (string) (2) - Number of nest attempt.

**NEST\_SBSTR** (string) (4) - Nest substrate.

**NEST\_HGT** (string) (4) - Nest height.

**NEST\_STAGE** (string) (1) - Current stage of nest.

**PARASITIZE** (True/False) (1) - Was nest parasitized?

**NEST\_FATE** (string) (2) - Ultimate fate of nest.

**BCVI\_EGGS** (numeric) (8) - Number of BCVI eggs.

**BCVI\_NSTLG** (numeric) (8) - Number of BCVI nestlings.

**BCVI\_FLEDG** (numeric) (8) - Number of BCVI fledglings.

**BHCO\_EGGS** (numeric) (8) - Number of BHCO eggs.

**BHCO\_NSTLG** (numeric) (8) - Number of BHCO nestlings.

**BHCO\_FLEDG** (numeric) (8) - Number of BHCO fledglings.

**EGGS\_SHOOK** (numeric) (8) - Number of BHCO eggs shook.

**EGGS\_REMOV** (numeric) (8) - Number of BHCO eggs removed.

**NSTLG\_KILL** (numeric) (8) - Number of BHCO nestlings killed.

**FLEDG\_KILL** (numeric) (8) - Number of BHCO fledglings killed.

**COMMENTS** (string) (150) - Any important notes.

## 9.2 Starting the Program

To start the program, double tap the BCVI icon with the pen. After writing your initials in the box, the main menu form in Figure 32 will appear.

## 9.3 Program Flow


### a. Add new territory

To record a new territory, tap the **Add Territory** button. The main menu form will be removed and the new territory form will appear as shown in Figure 33.

The program will insert default values for current date, observer initials, nest height, and record number. You can increment or decrement the current date by tapping the spin button. You can also change the default initials by double tapping the Observer text box. Write the new initials in the box provided. All subsequent records will contain the new initials.

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## Black-Capped Vireo Survey



Add new territory --> **Add Territory**

Add new observation --> **Add Observation**


Show all territory observations --> **Show History**

Edit a record --> **Edit Record**

Exit program --> **Exit**

Figure 32. BCVI main menu.



NEW TERRITORY



Date  

Observer  Start Time  Mated? ☐

Band Status ☐ Male Band Info. ☐ Female Band Info.

**Male Band Info.**


Upper Left   Upper Right   Band

Lower Left   Lower Right   Number


Confirm band colors? ☐

Banding Date

Banding Age

Current Age  

**Location**

Original Tr. Area  Territory   Easting

Current Tr. Area  Aerial  Northing

**Nest** ☐

Stop Time

**Comments** **Save** **Menu**

Figure 33. BCVI new territory form.

In the upper right corner is the *Band Status* frame, which contains two option buttons. These option buttons control what you see in the band information frame. The default band information frame is *Male Band Info*. To bring up the *Female Band Info* frame, tap the Female Band Info. option button. Use both option buttons to record banding information for males and females.

Start Time - Double tap the text box to insert the observation start time or write it in the box.

Mated? - Tap the check box if male is mated.

Upper Left - Lower Right - Choose a color code for each leg band from the combo box.

Confirm band colors? - If you're sure of the band colors, tap the check box. The program will automatically search the BCVI\_BND.DBF file for the BCVI matching that band color combination and retrieve the band number, banding age, banding date, and original training area.

Current Age - Choose an age code from the combo box.

Current Tr. Area - Write the current training area in the text box.

Territory - Use the spin button to increment the territory number or write it in the text box.

Aerial - Write the aerial photo number in the text box.

Easting - Write the easting coordinate in the text box.

Northing - Write the northing coordinate in the text box.

- Tap this button to record nesting information. Figure 34 shows an example of the nesting frame. To eliminate the frame, double tap it.

No Nest? - Check this box if evidence of nesting was found but no nest was actually observed.

Nesting Effort - Accept the default nesting effort number or use the spin button to increment the number. From the time you enter a nesting effort

NEW TERRITORY			
Date	04/04/96	Band Status	40
Observer	SM	<input type="radio"/> Male Band Info. <input type="radio"/> Female Band Info.	
Start Time	1404	Mated?	<input checked="" type="checkbox"/>
<b>Nesting</b> No Nest? <input type="checkbox"/> Nesting Effort <input type="text"/>		Nest Description Nest Substrate <input type="text"/>	
Nest Stage <input type="text"/>		Nest Height (meters) <input type="text"/>	
Nest Fate <input type="text"/>		Banding Date 07/16/92 Banding Age AHY Current Age 5Y	
<b>Nest Contents</b> BCVI Eggs <input type="text"/>		BCVI Nestlings <input type="text"/>	
BCVI Fledglings <input type="text"/>		427 623	
Parasitized? <input type="checkbox"/>			
Stop Time	<input type="text"/>	Comments	Save
		Menu	

Figure 34. BCVI nesting information frame.

number to the time you enter a nest fate, the program will automatically carry forward the nesting effort number for new observations.

Nest Stage - Choose a code from the combo box.

Nest Substrate - Choose a code from combo box.

Nest Height - Use the spin button to increment or decrement nest height by 0.1 meter or accept the default.

Nest Fate - Choose a code from the combo box.

BCVI Eggs - Use the spin button to increment/decrement the number of BCVI eggs or write it in the text box.

BCVI Nestlings - Use the spin button to increment/decrement the number of BCVI nestlings or write it in the text box.

BCVI Fledglings - Use the spin button to increment/decrement the number of BCVI fledglings or write it in the text box.

Parasitized - Check this box if the nest has been parasitized. Once checked, another frame will appear containing text boxes for BHCOs. When finished entering values for them, double tap the frame to make the frame disappear.

BHCO Eggs - Use the spin button to increment/decrement the number of BHCO eggs or write it in the text box.

BHCO Nestlings - Use the spin button to increment/decrement the number of BHCO nestlings or write it in the text box.

BHCO Fledglings - Use the spin button to increment/decrement the number of BHCO fledglings or write it in the text box.

Eggs Shook - Use the spin button to increment/decrement the number of BHCO eggs shook or write it in the text box.

Eggs Removed - Use the spin button to increment/decrement the number of BHCO eggs removed or write it in the text box.

Nestlings Removed - Use the spin button to increment/decrement the number of BHCO nestlings removed or write it in the text box.

Fledglings Removed - Use the spin button to increment/decrement the number of BHCO fledglings removed or write it in the text box.

Stop Time - Double tap the text box to insert the observation stop time or write it in the box.

**Comments** - Tap this button and write any necessary comments in the white space provided. To eliminate the box, double tap it.

When you've completed making entries, verify your start and stop times and tap the **Save** button. The record will automatically be appended to the end of the database. Tap **Menu** to remove the new territory form and return to the main menu form.

b. Add new observation

To add a new observation, tap **Add Observation**. The program will ask you to enter a territory ID. Figure 35 shows an example.



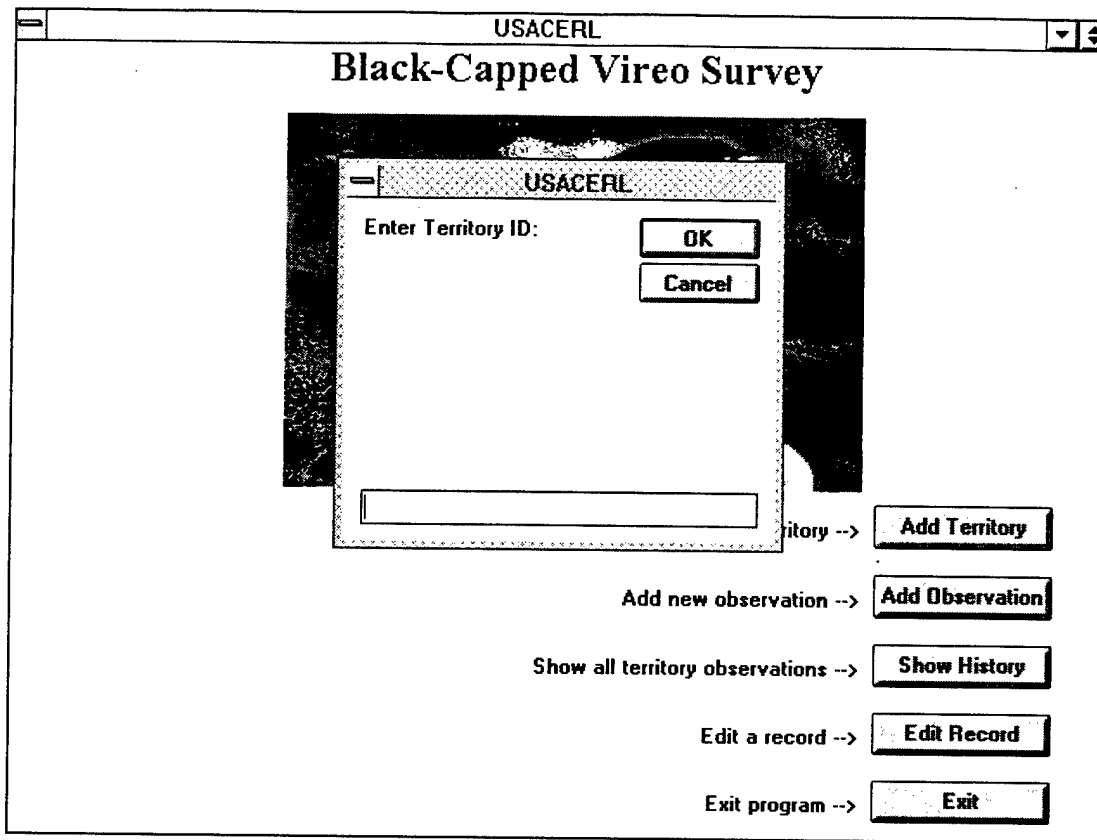


Figure 35. BCVI selection list box.

Write the training area number followed by a "-" and then the territory number (i.e., 12-3) in the box. Tap **OK** and the new observation form shown in Figure 36 will appear. Tap **Cancel** to cancel your request.

All fields in this form work exactly the same way as the fields in the new territory form. The only difference is the flashing *Confirmed?* frame. This frame flashes to emphasize its importance. To stop the flashing, you must tap "Yes" or "No" for the male and also for the female if there is one. You cannot save a record until you've satisfied the *Confirmed?* requirements.

The date, observer, and record number fields all have default values entered. You can increment/decrement the date by tapping the spin button. The default initials can be changed by double tapping the Observer text box. Band number, leg bands, banding age, banding date, current age, and nesting effort, substrate, and height are all carried forward from the last occurrence of the ID code in the database. If you are entering leg band colors for the first time, tap "Yes" in the *Confirmed?* frame to retrieve the corresponding band number, banding age, and banding date from the BCVI\_BND.DBF file.

NEW OBSERVATION FOR 2-1					
Date	04/04/96	Observer	SM	Start Time	40
Male Band Info.			Band Status		
Confirmed?		Band	2171	Band. Date	05/25/95
Yes <input type="radio"/> No <input type="radio"/>		Number	96682	Band. Age	ASY
Mated? <input checked="" type="checkbox"/>					
Upper Left	BK	Upper Right	MG		
Lower Left	RD	Lower Right	SI	Current Age	3Y
Nesting					
No Nest? <input type="checkbox"/>		Nest Contents			
Nesting Effort	1	BCVI Eggs	0	BCVI Nestlings	0
Nest Substrate	FRT	Parasitized? <input type="checkbox"/>			
Nest Height (m)	2.8				
Nest Stage		Nest Fate			
Stop Time					
Comments		Save		New Record	
				Menu	

Figure 36. BCVI new observation form.

To save the record to the database, verify your start and stop times and tap **Save**. To add another record for the same Territory ID, tap **New Record**. To remove the new observation form and return to the main menu, tap **Menu**.

#### c. Show History

To display a report of all observations for a given ID code, tap **Show History**. The program will ask you to enter a territory ID exactly like adding a new observation. See Figure 35 for an example. Tap **Cancel** to cancel your request or write the territory ID in the text box and tap **OK**. The fields displayed include ID code, date, male confirmed, male band number, female confirmed, female band number, nest attempt, nest stage, BCVI eggs, BCVI nestlings, BCVI fledglings, and comments. Figure 37 shows an example.

Use the left and right arrows to view each page and the printer icon to direct the report to the printer. To return to the main menu, tap the control box at the top left hand corner of the screen and tap the "Close" option.

ID	Date	Male Confirm	Male Band Number	Female Confirm	Female Band Number	Nest Attempt	Nest Stage	BCVI Eggs	BCVI Nstlg	BCVI Fledg
9-1	01/24/96		1810-28956			1	B	0	0	0
9-1	01/28/96	True	1810-28956	True	1960-03907	1	I	1	0	0
9-1	02/24/96	False	1810-28956	False	1960-03907	1	U	0	0	0
9-1	03/24/96	True	1810-28956	False	1960-03907	2	B	0	0	0

Total Observations: 4

Figure 37. BCVI summary of observations form.

d. Edit a record

To edit an existing record, tap **Edit Record**. The program will again ask you to enter the territory ID. If you want to forego the edit process, tap **Cancel**. Otherwise, write the territory ID in the text box and tap **OK**. The edit form will appear displaying the last record matching that ID code. Figure 38 shows an example.

You now have access to the entire set of records belonging to that ID code. The text box in the lower left corner shows the number of matching records. Use the FIND buttons to view and/or edit those records.

The controls on the edit form work exactly the same way as on the new observation form. Tap **Save** to save any changes to the database. Tap **Cancel** to exit out of edit mode and cancel any changes you've made. The FIND buttons will still be available to view matching records. Use **Cancel** as well to make the nesting frame disappear if you're no longer in edit mode. Tap **Menu** to remove the edit form and return you to the main menu form.

EDIT RECORD									
Date	04/06/96	Observer	SM	Start	13:57	Stop	13:58	39	
Location									
Training Area	8	Region	EAST	Easting	131				
Territory	1	Aerial	8	Northing	966				
Male Band Info.									
Band	1290	Upper Left	OR	Upper Right	RD				
Number	90804	Lower Left	BK	Lower Right	SI				
Band. Date	07/27/92	Band. Age	AHY	Current Age	5Y				
<input type="button" value="Confirm"/>									
Female Band Info.									
Band	1930	Upper Left	OR	Upper Right	BK				
Number	72778	Lower Left	YE	Lower Right	SI				
Band. Date	07/16/92	Band. Age	AHY	Current Age	5Y				
<input type="button" value="Confirm"/>									
<input type="button" value="Record 6 of 6"/>		<input type="button" value="Nesting"/>		<input type="button" value="Comments"/>					
<input type="button" value="Cancel"/>		<input type="button" value="Save"/>		<input type="button" value="Menu"/>					

Find Record

Figure 38. BCVI edit form.

## e. Exit the Program

To exit the program, tap  from the main menu. All files are closed.

## 10 Golden-Cheeked Warbler Program

(GCWA.MAK)

### 10.1 General Description

The Golden-Cheeked Warbler program records location and nesting data on GCWAs. It can record data from the intensive study area, point counts, and returning birds. However, it doesn't record measurement data. When you save the data, the data are stored in a DBase IV database file under the path name

**C:\VB\GCWA\GCWA.DBF**. The field names and descriptions of this file are given below. Data types and lengths are given in parentheses.

**REC\_NUMBER** (string) (4) - Number of the record in the database.

**DATE** (string) (8) - Current date.

**START** (string) (5) - Start time of observation.

**STOP** (string) (5) - Stop time of observation.

**MINUTES** (numeric) (8) - The difference between start and stop times in minutes. The program automatically calculates and inserts this field into the record.

**OBSERVER** (string) (3) - Observer's initials.

**TARG\_OBS** (true/false) (1) - Was target bird observed?

**TARG\_BAND** (string) (4) - Band number prefix for target bird.

**TARG\_NUMBR** (string) (5) - Band number suffix for target bird.

**TU\_LEFT** (string) (2) - Color code representing the upper left leg band of the target bird.

**TL\_LEFT** (string) (2) - Color code representing the lower left leg band of the target bird.

**TU\_RIGHT** (string) (2) - Color code representing the upper right leg band of the target bird.

**TL\_RIGHT** (string) (2) - Color code representing the lower right leg band of the target bird.

**TARG\_EAST** (string) (6) - Easting coordinate where target bird was originally banded.

**TARG\_NORTH** (string) (7) - Northing coordinate where target bird was originally banded.

**N\_TARG\_OBS** (true/false) (1) - Was a non-target bird observed?

**OBS\_BAND** (string) (4) - Band number prefix for observed bird.

**OBS\_NUMBER** (string) (5) - Band number suffix for observed bird.

**BAND\_DATE** (string) (8) - Date when observed bird was originally banded. The program will automatically insert this field into the record.

**OU\_LEFT** (string) (2) - Color code representing the upper left leg band of the observed bird.

**OL\_LEFT** (string) (2) - Color code representing the lower left leg band of the observed bird.

**OU\_RIGHT** (string) (2) - Color code representing the upper right leg band of the observed bird.

**OL\_RIGHT** (string) (2) - Color code representing the lower right leg band of the observed bird.

**OBS\_TR\_AR** (string) (4) - Training area where observed bird was banded originally. The program will automatically insert this field into the record.

**OBS\_EAST** (string) (6) - Easting coordinate where observed bird was banded originally. The program will automatically insert this field into the record.

**OBS\_NORTH** (string) (7) - Northing coordinate where observed bird was banded originally. The program will automatically insert this field into the record.

**BAND\_AGE** (string) (3) - Age when observed bird was originally banded. The program will automatically insert this field into the record.

**MATED** (true/false) (1) - Was the observed bird mated?

**F\_CONFIRM** (true/false) (1) - Was female sighting confirmed?

**TR\_AREA** (string) (4) - Current training area of observed bird.

**TERRITORY** (string) (2) - Current territory of observed bird.

**EASTING** (string) (6) - Current easting coordinate of observed bird.

**NORTHING** (string) (7) - Current northing coordinate of observed bird.

**NEST\_NUMBR** (string) (1) - Nest number.

**NEST\_SBSTR** (string) (4) - Nest substrate.

**NEST\_HGT** (string) (4) - Nest height.

**NEST\_STAGE** (string) (1) - Stage of nest.

**NEST\_FATE** (string) (2) - Ultimate fate of nest.

**GCWA\_EGGS** (numeric) (8) - Number of GCWA eggs.

**BHCO\_EGGS** (numeric) (8) - Number of BHCO eggs.

**GCWA\_NSTLG** (numeric) (8) - Number of GCWA nestlings.

**BHCO\_NSTLG** (numeric) (8) - Number of BHCO nestlings.

**GCWA\_FLEDG** (numeric) (8) - Number of GCWA fledglings.

**BHCO\_FLEDG** (numeric) (8) - Number of BHCO fledglings.

**NSLG\_CONFM** (true/false) (1) - Were nestlings confirmed?

**HY\_BIRD\_AG** (string) (2) - Estimated age of hatching year birds.

**FLDG\_DATE1** (string) (8) - Estimated fledging date for first group of nestlings.

**FLDG\_DATE2** (string) (8) - Estimated fledging date for second group of nestlings.

**COMMENTS** (string) (200) - Any important notes.

## 10.2 Starting the Program

To start the program, double tap the GCWA icon with the pen. After writing your initials in the box, the data entry form will appear as in Figure 39.

**USACERL**

Date  Observer  Start Time

**Target Bird Leg Bands**

Upper Left  Upper Right   
 Lower Left  Lower Right

Band  Orig Easting   
 Number  Orig Northing

**Observed Bird Leg Bands**

Upper Left  Upper Right   
 Lower Left  Lower Right

Band  Number   
 Mated? ☒ Confirm female? ☒  
 Confirm band colors? ☐

**Location**

Training Area  Territory  Easting  Northing

Stop Time

Record 5 of 5

Figure 39. BCVI data entry form.



The information displayed on the form (assuming the database is not empty) is the last record in the database. The total number of records in the database is shown at the bottom left corner of the form. The number at the top right corner indicates the number of the individual record in the database. From here, you can add, edit, or view any record in the database.

### 10.3 Program Flow

#### a. Add new record

To add a new record, tap the **New Obs** button. The program will respond by asking if you're looking for a particular bird. Tap **Cancel** to cancel your request. Tap **No** if you're not looking for a particular bird but wish to enter data. Tap **Yes** to bring up the target bird selection form shown in Figure 40.

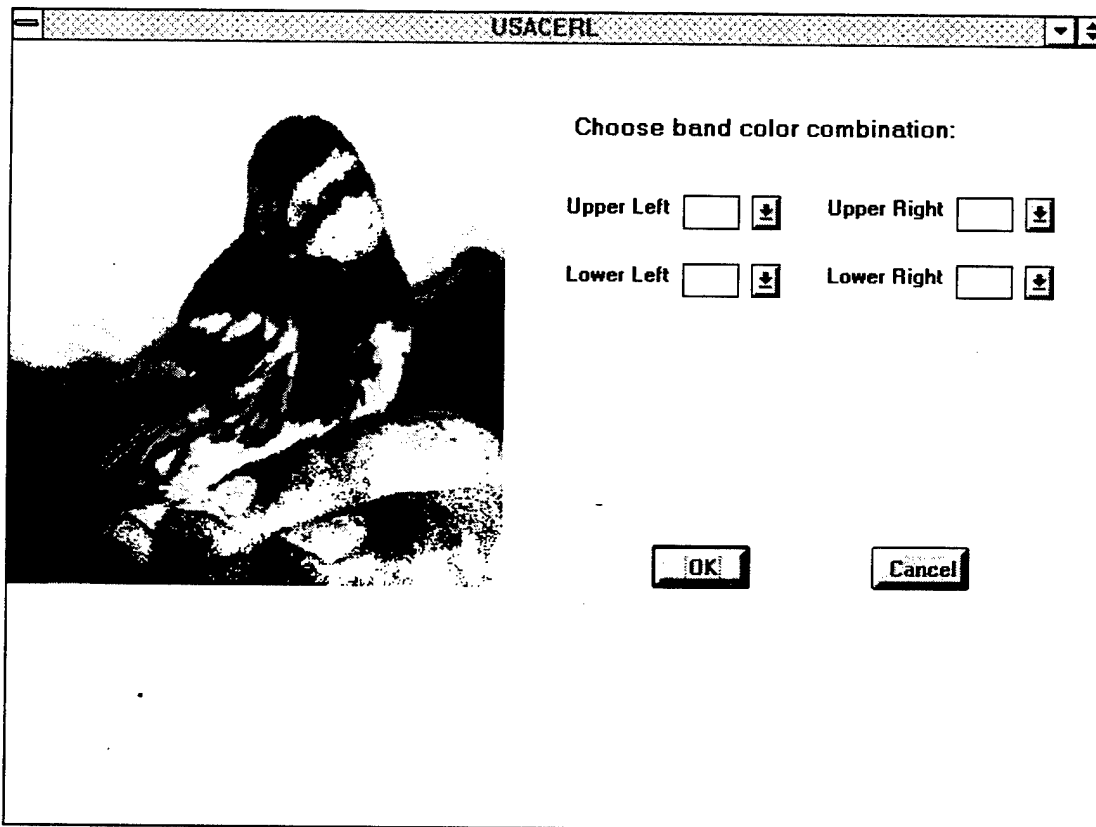


Figure 40. Target bird selection form.

Tap **Cancel** to cancel your request or choose a leg band color from each combo box. Tap **OK** and the target bird selection form will disappear while the data entry screen will reappear. The program will clear all fields but retrieve the band colors,

and original easting and northing coordinates from the GCWA\_BND.DBF file and insert them into the *Target Bird* frame.

Whether or not you're looking for a target bird, selecting either ☐ Yes ☐ or ☐ No ☐ will always place default values in the date, observer, training area, nest height, and record number fields. You can increment or decrement the date by tapping the spin button. You can change the default initials as well by double tapping the Observer text box and writing the new initials in the box provided. All subsequent records will contain the new initials.

Start Time - Double tap the text box to insert the observation start time or write it in the box.

Upper Left - Lower Right - Choose a color code for each leg band from the combo box.

Confirm band colors? - If you're sure of the band colors, tap the check box. The program will automatically search the GCWA\_BND.DBF file for the GCWA matching that band color combination and retrieve the band number. It will also retrieve the original banding date, age, training area, easting, and northing coordinates to save for later.

Mated? - Tap the check box if the bird was mated.

Confirm Female - Tap the check box if you confirmed a female sighting.

Training Area - Write the training area in the text box or accept 13B as the default.

Territory - Use the spin button to increment/decrement the territory or write it in the text box.

Easting - Write the easting coordinate in the text box.

Northing - Write the northing coordinate in the text box.

☐ Nest ☐ - Tap this button to record nesting data. Figure 41 shows an example of the nesting frame. To eliminate the frame, double tap it.

USACERL

Date 04/05/96 Observer SM Start Time 1131

**Nesting**

Nest Number Nest Stage Nest Fate

Nest Description Nest Substrate Nest Height

**Nest Contents**

Eggs Nestlings Fledglings

GCWA BHCO GCWA BHCO GCWA BHCO

Confirm Nestings? Age of HY bird

Fledge Date 1 Fledge Date 2

**Target Bird**

Counting 156

Counting 706

**Observed Bird**

Count 3763

firm female? ☐

Comments

New Observation New Obs Nest Save Cancel Edit Exit

Figure 41. GCWA nesting data frame.

Nest Number - Use the spin button to increment/decrement the nest number or write it in the text box.

Nest Stage - Choose a code from the combo box.

Nest Fate - Choose a code from the combo box.

Nest Substrate - Choose a code from the combo box.

Nest Height - Use the spin button to increment or decrement nest height by 0.1 meter or accept the default.

GCWA Eggs - Use the spin button to increment/decrement the number of GCWA eggs or write it in the text box.

BHCO Eggs - Use the spin button to increment/decrement the number of BHCO eggs or write it in the text box.

GCWA Nestlings - Use the spin button to increment/decrement the number of GCWA nestlings or write it in the text box.

BHCO Nestlings - Use the spin button to increment/decrement the number of BHCO nestlings or write it in the text box.

GCWA Fledglings - Use the spin button to increment/decrement the number of GCWA fledglings or write it in the text box.

BHCO Fledglings - Use the spin button to increment/decrement the number of BHCO fledglings or write it in the text box.

Confirm Fledglings - Tap the check box if you've confirmed fledglings.

Age of HY Bird - Use the spin button to increment/decrement the estimated age of the GCWA fledglings or write it in the text box.

Fledge Date 1 - Double tap the text box to insert the current date. Use the spin button to increment/decrement the date.

Fledge Date 2 - Double tap the text box to insert the current date Use the spin button to increment/decrement the date.

Comments - Tap this button and write any necessary comments in the white space provided. To eliminate the screen, double tap it.

Stop Time - Double tap the text box to insert the observation stop time or write it in the box.

b. Edit a record

To edit a record, tap the Edit button. The same target bird selection form shown in Figure 40 will appear. If you want to forego the edit process, tap Cancel and return to the original form. Otherwise, enter all the leg band colors and tap OK. The data entry form will reappear and you will have access to the entire set of records matching that color band combination. Use the FIND buttons to view and/or edit those records.

c. Cancel an action

Tap Cancel to break out of any action. If you're adding a new record, the fields are cleared and the database pointer will point to the last record in the database. If

you're editing a record, all changes will be disregarded and you will no longer be in edit mode. The database pointer will still point to the current record.

If you are scrolling through the database examining the comments or nesting data of a particular record, tapping  will make the comments box or nesting frame disappear, double tapping will not.

d. Save a record

To save a new record or one that has been edited, tap the  button. A new record will be appended to the end of the database. An edited record will retain its position in the database.

e. Exit the program

To exit the program, tap . All files are closed.

# 11 Database Backup Program

(BACKUPDB.MAK)

## 11.1 General Description

The Database Backup program is a very simple and straightforward program that does exactly what its name implies. It will backup any database you choose to a floppy disk. The name of the file will be the same except the extension will be .BAK instead of .DBF. The purpose of database backup is twofold: (1) it is saved on different media separate from the computer itself, and (2) it can be merged with another like database into a separate computer, creating a master database.

## 11.2 Starting the Program

To start the program, double tap the DB\_Backup icon with the pen. The form shown in Figure 42 will appear.

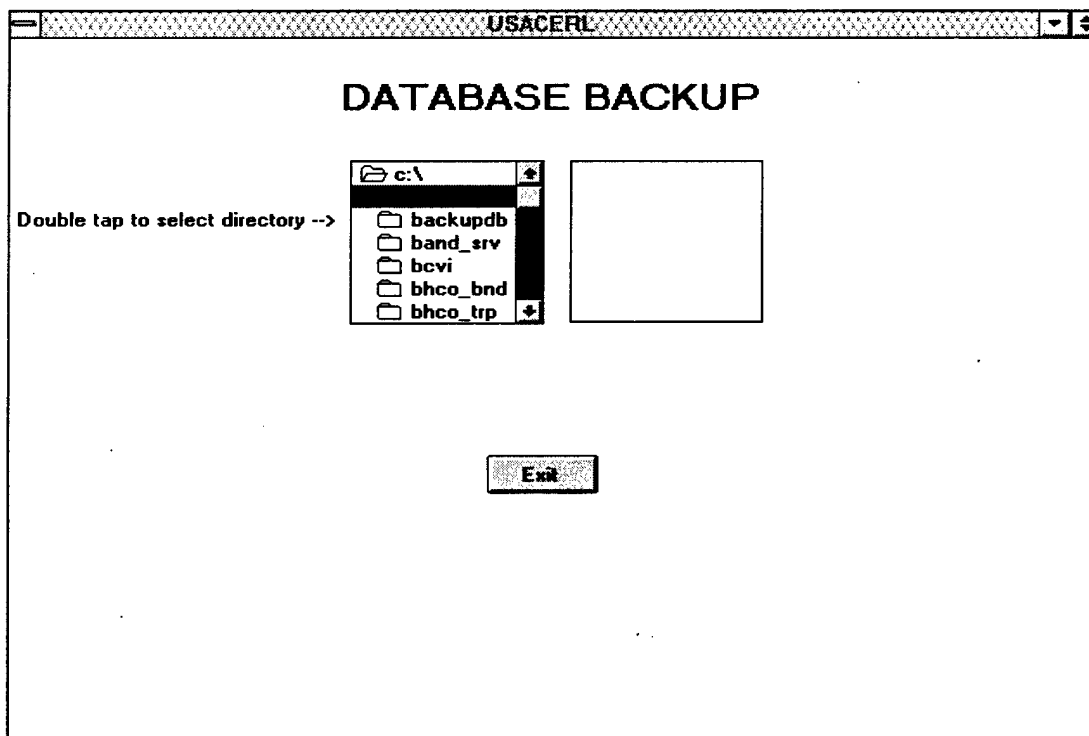


Figure 42. Database backup form.

### 11.3 Program Flow

Use the scroll arrows to view the subdirectories under C:\VB. Double tap your chosen subdirectory and the list box will display all databases under that subdirectory. Tap the database name you wish to back up and the program will ask you to verify it. From this point, tap  if you want to exit the program. Tap  to return to the beginning and start again. Tap  and the program will continue the backup process by asking you to select either the "A:" or "B:" drive to place your disk into. Write "A" or "B" in the text box, insert the appropriate disk, and tap . When the back up is complete, the program will issue a message.

### 11.4 Exit the program

To exit the program, tap . All files are closed.

## 12 Data Analysis

To expedite data analysis, macros written in Microsoft Excel 5.0 were used to analyze the raw data. Macros are nothing more than programs written in the Excel programming language. All macros should be loaded in the directory **C:\MSOFFICE\EXCEL\XLSTART** and can be executed by calling them up and selecting 'RUN' from Excel's menu bar. However, to simplify matters, these macros have all been assigned to custom buttons. To run any macro, start Microsoft Excel 5.0 and make sure none of the database files are open. Look for the custom button corresponding to the program you want to run on the custom tool bar. Click the button and the code will automatically execute and an output table will be created.

Sixteen macros are currently available, all of which generate summary tables or lists. Nine macros analyze data on black-capped vireos, five analyze data on golden-cheeked warblers, and one each analyze data for brown-headed cowbirds and non-target birds.

### 12.1 BCVI Territory Summary

This macro called **BCVI\_TER.XLS** uses **BCVI.DBF** to generate a summary table of BCVI territories per region and training area. The output consists of one Excel sheet with the summary table. Figure 43 shows an example.


### 12.2 BCVI Nest Fates and Success Rates

**BCVI\_NF.XLS** uses **BCVI.DBF** to generate a summary table of nest fates and success rates per region. The output consists of three Excel sheets. The first two sheets are intermediate tables used during processing. Sheet 3 is the output table summarizing the nest fate totals of all regions plus an added column showing percent success. Figure 44 shows an example.




Microsoft Excel - BCVI\_BAK.DBF

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	A1	REGION									
	A	B	C	D	E	F	G	H	I	J	
1	REGION	TR_AREA	BCVI TERRITORIES								
2	EALF	66	12								
3		74	7								
4		75	9								
5		81	1								
6	EALF Total		29								
7	EARA	2	59								
8		3	7								
9		4	1								
10		5	6								
11	EARA Total		73								
12	NOLF	63	4								
13	NOLF Total		4								
14	SOLF	91	18								
15		92	5								
16	SOLF Total		23								
17	WEFH	22	2								
18		24	32								
19	WEFH Total		34								
20	WELF	65	14								
21		80	30								
22		82	21								
23	WELF Total		65								
24	WERA	43	5								
25		44	57								
26		45	1								
27		53	2								


SUMMARY OF BCVI TERRITORIES / BCVI\_OLD

Ready

Figure 43. BCVI territory summary.

Microsoft Excel - BCVI\_BAK.DBF

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A1										
A	B	C	D	E	F	G	H	I	J	
1	REGION	ABANDONED	ABANDONED (Para)	DEPREATED	DESTROYED	FAILED (Unknown)	SUCCESSFUL	UNKNOWN	% SUCCESSFUL	Grand Total
2	EALF	1	0	1	0	0	3	5	60.00%	10
3	EARA	14	5	29	10	4	18	2	22.50%	82
4	NOLF	1	0	3	1	0	0	0	0.00%	5
5	SOLF	2	3	7	2	1	7	2	31.82%	24
6	WEFH	3	0	17	0	0	14	1	41.18%	35
7	WELF	3	3	13	1	0	15	8	42.86%	43
8	WERA	8	0	10	2	3	14	2	37.84%	39
9	Grand Total	32	11	80	16	8	71	20	32.57%	238
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										

Sheet3 / Sheet2 / Sheet1 / BCVI\_BAK

Ready

Figure 44. BCVI nest fates and success rates.

### 12.3 BCVI Nest Fates and Success Rates (monitored >3 dates)

BCVI\_NF3.XLS is basically the same as the previous macro except that it excludes all territories that were not monitored at least three times. The output will consist of four Excel sheets. The first three sheets are intermediate tables used during processing. Sheet 4 is the output table and has the same format as Figure 44.

### 12.4 BCVI Productivity and Pair Success of Successful Territories

BCVI\_PR.XLS uses BCVI.DBF to generate a summary table of productivity and pair success per region for all territories. The output consists of four Excel sheets. The first three sheets are intermediate tables used during processing. Sheet 4 is the output table summarizing the total number of pairs, successful pairs, and young fledged. Two additional columns show productivity for all pairs and productivity for successful pairs. Figure 45 shows an example.

### 12.5 BCVI Productivity and Pair Success of Successful Territories (monitored >3 dates)

BCVI\_PR3.XLS is basically the same as the previous macro except that it only

	A1	REGION				
	A	B	C	D	E	F
1	REGION	PAIRS	SUCCESSFUL PAIRS	YOUNG	PROD. FOR ALL	PROD. FOR SUCC. PAIRS
2	EALF	28	2	5	0.178571429	2.5
3	EARA	73	15	31	0.424657534	2.066666667
4	NOLF	4	0	0	0	#DIV/0!
5	SOLF	22	5	16	0.727272727	3.2
6	WEFH	34	13	36	1.058823529	2.769230769
7	WELF	65	12	24	0.369230769	2
8	WERA	62	12	30	0.483870968	2.5
9	Grand Total	288	59	142	0.493055556	2.406779661
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						

Figure 45. BCVI productivity and pair success.

includes territories that were monitored three or more times. The output consists of four Excel sheets. The first three sheets are intermediate tables used during processing. Sheet 4 is the output table and has the same format as Figure 45.

## 12.6 BCVI Productivity and Pair Success of All Territories

BCVI\_PRD.XLS uses BCVI.DBF to generate a summary table of productivity and pair success for all pairs of BCVIs with or without nests for each region. The output consists of one Excel sheet summarizing the total number of pairs, young fledged, and productivity. Figure 46 shows an example.

	A	B	C	D	E	F	G	H	I	J	K
1	REGION	PAIRS	YOUNG	PRODUCTIVITY							
2	EALF	29	20	0.689655172							
3	EARA	74	58	0.783783784							
4	NOLF	4	4	1							
5	SOLF	23	28	1.217391304							
6	WEFH	34	52	1.529411765							
7	WELF	65	45	0.692307692							
8	WERA	65	77	1.184615385							
9	Grand Total	294	284	0.965986395							

Figure 46. BCVI productivity and pair success for all BCVI pairs.

## 12.7 Age Structures for Banded BCVIs

BCVI\_AGE uses BCVI.DBF and BCVI\_BND.DBF to generate three summary tables of age structures for all banded adult BCVIs. The output consists of three Excel sheets. Sheets 1 and 2 contain age structure summaries for all adult males and females observed. Sheet 3 contains an age structure summary for all male and female adults banded. Figures 47 through 49 show examples of Sheets 1 through 3, respectively.

Microsoft Excel - Age Structures For BCVis

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A4 REGION

**ADULT MALE BCVis OBSERVED**

REGION	3Y	4Y	5Y	6Y	7Y	A3Y	A4Y	A5Y	A6Y	A7Y	A8Y	AHY	ASY	ATY	SY	TY	(blank)	Grand Total
EALF	0	0	1	0	0	0	0	0	0	0	0	2	8	1	5	0	0	17
EARA	0	4	1	0	1	1	0	1	2	0	1	1	23	7	9	8	0	59
NOLF	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	3
SOLF	0	0	1	0	0	4	0	0	0	0	0	0	7	1	2	1	0	16
WEFH	1	2	0	0	0	1	3	1	0	0	0	0	8	4	2	1	0	23
WELF	0	0	1	1	0	0	0	0	0	0	0	0	8	2	14	2	0	28
WERA	0	1	1	0	0	7	1	1	0	1	0	0	18	4	10	4	0	48
Grand Total	1	7	5	1	1	13	4	3	2	1	1	3	74	19	42	17	0	194

Sheet1 Sheet2 Sheet3

Ready

Figure 47. Age structures for adult male BCVI.

Microsoft Excel - Age Structures For BCVis

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A4 REGION

**ADULT FEMALE BCVis OBSERVED**

REGION	3Y	4Y	5Y	A4Y	A5Y	A7Y	AHY	ASY	ATY	SY	TY	(blank)	Grand Total
EALF	0	0	0	0	0	0	1	2	0	4	0	0	7
EARA	1	0	1	0	0	0	0	7	2	7	5	0	23
NOLF	0	0	0	0	0	0	0	0	0	0	0	0	0
SOLF	0	0	0	0	0	0	0	0	0	2	0	0	2
WEFH	0	0	0	1	0	0	1	4	1	2	2	0	11
WELF	0	0	0	1	1	1	1	5	1	3	0	0	13
WERA	0	1	0	0	0	0	0	6	2	8	1	0	18
Grand Total	1	1	1	2	1	1	3	24	6	26	8	0	74


Sheet1 Sheet2 Sheet3

Ready

Figure 48. Age structures for adult female BCVI.

Microsoft Excel - Age Structures For BCVis

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A4 REGION

	A	B	C	D	E	F	G	H	I	J	K
1	ADULT BCVis BANDED										
2											
3		MALE AGE					FEMALE AGE				
4	REGION	AHY	ASY	SY	(blank)	Grand Total	AHY	ASY	SY	(blank)	Grand Total
5	EALF	1	6	5	0	12	1	1	4	0	6
6	EARA	1	22	7	0	30	0	6	7	0	13
7	NOLF	0	2	1	0	3	0	0	0	0	0
8	SOLF	0	3	2	0	5	0	0	2	0	2
9	WEFH	0	8	2	0	10	1	4	1	0	6
10	WELF	0	8	13	0	21	1	5	3	0	9
11	WERA	0	18	8	0	26	0	6	8	0	14
12	Grand Total		2	67	38	107		3	22	25	50
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											

Sheet1 / Sheet2 / Sheet3

Ready

Figure 49. Age structures for banded adult BCVI.

## 12.8 BCVI Dispersal Distance

This macro uses SI\_RECAP.DBF to generate a summary table of dispersal distances for returning BCVis. The output consists of two Excel sheets. Sheet 1 is an intermediate table used during processing. Sheet 2 is the output table summarizing the total number of returning BCVis, the average dispersal distance, and the number of BCVis whose dispersal distance was less than 500 meters. Figure 50 shows an example of Sheet 2.

## 12.9 BHCO Parasitism Rates of BCVI Nests

BHCO\_PAR.XLS uses BCVI.DBF to generate a summary table of parasitism rates of BCVis by BHCOs. The output consists of three Excel sheets. The first two sheets are intermediate tables used during processing. Sheet 3 is the output table summarizing the total number of BCVI nests, the total number of parasitized nests, and the parasitism percentage. Figure 51 shows an example.

Microsoft Excel - SI\_RECAB.DBF

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A1		TR AREA						
	A	B	C	D	E	F	G	H
1	TR_AREA	SEX	NO. OF BCVis	<=500M	AVERAGE DISPERSAL DISTANCE			
2	17	Male	3		811.0349935			
3		Female	2		559.5042689			
4	17 Total		5	1	710.4227036			
5	3	Male	1		211.4000946			
6	3 Total		1	1	211.4000946			
7	7	Male	1		605.0694175			
8		Female	2		621.3151567			
9	7 Total		3	0	615.8999103			
10	Grand Total		9	2	623.4681493			
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								

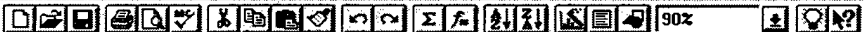
Sheet2 / Sheet1 / SI\_RECAB /

Ready

Figure 50. BCVI dispersal distance.

Microsoft Excel - BCVI.DBF

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A1	REGION													
A	B	C	D	E	F	G	H	I	J	K	L			
1	REGION	ID	PARASITIZED NESTS	%PARASITISM										
2	EARA	2-10	1											
3		2-21	1											
4		2-31	2											
5		2-4	1											
6		2-46	1											
7		2-56	1											
8		2-58	1											
9		2-9	1											
10		3-47	1											
11		3-66	1											
12	EARA Total		11	17.46%										
13	NOLF	63-2	1											
14	NOLF Total		1	25.00%										
15	SOLF	91-91	1											
16		91-92	1											
17		91-94	1											
18	SOLF Total		3	17.65%										
19	WEFH	24-28	1											
20		24-7	1											
21	WEFH Total		2	6.67%										
22	WELF	65-1	1											
23		65-10	1											
24		65-12	2											
25		65-4	2											
26		65-5	2											
27		82-10	1											
28	WELF Total		9	27.27%										
29	Grand Total		26	14.86%										
30														
31														

Sheet3 / Sheet2 / Sheet1 / BCVI /

Ready

Figure 51. BHCO parasitism rates of BCVI.

## 12.10 BHCO and Non-Target Species Trap Deaths

BHCO\_NTG.XLS uses BHCO\_TRP.DBF to generate a summary table of BHCO deaths and incidental trap deaths of non-target species per month. The output consists of one Excel sheet summarizing the total number of male and female cowbirds deaths and incidental non-target deaths. Figure 52 shows an example.

MONTH	FEMALES KILLED	MALES KILLED	INCIDENTAL DEATHS
January	407	234	1
February	142	153	6
March	392	299	2
April	1239	545	2
May	987	951	7
June	201	264	16
July	44	51	0
August	109	73	9
September	67	134	2
October	383	288	15
November	555	350	1
December	581	304	2
Grand Total	5107	3646	63

Figure 52. BHCO and non-target species deaths.

## 12.11 Breakdown of Non-Target Species Deaths

NTG\_DEAD.XLS uses NON\_TARG.DBF to generate a summary table of the different non-target species that were accidentally killed within BHCO traps. The output consists of one Excel sheet containing a breakdown of the number of non-target deaths per month. Figure 53 shows an example.

## 12.12 Summary of GCWAs Captured

GCWA\_1.XLS uses GCWA\_BND.DBF to generate a summary of all GCWAs captured throughout the field season. The output consists of four Excel sheets. Sheet 1 is an

Microsoft Excel - NON TARG.DBF										
File Edit View Insert Format Tools Data Window Help										
90%										
A1	SPECIES									
	A	B	C	D	E	F	G	H	I	J
1	SPECIES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
2	American Kestrel	0	0	0	0	0	0	0	0	0
3	Bewick's Wren	0	0	0	0	0	2	0	0	0
4	Blue Jay	0	0	0	1	0	0	0	0	0
5	Brewer's Blackbird	0	0	0	0	0	0	0	0	0
6	Bronzed Cowbird	0	0	0	2	3	0	0	2	0
7	Cassin's Sparrow	0	0	0	0	0	0	0	0	0
8	Common Grackle	0	0	0	0	1	3	0	0	0
9	Downy Woodpecker	0	0	0	0	0	0	0	0	0
10	Eastern Bluebird	0	0	0	0	1	0	0	0	0
11	Eastern Phoebe	0	0	0	0	0	0	0	0	0
12	Field Sparrow	0	0	0	0	0	0	0	0	0
13	Harris' Sparrow	1	1	0	0	0	0	0	0	0
14	House Finch	0	0	0	0	0	0	0	0	0
15	Lark Sparrow	0	0	0	0	0	0	0	0	0
16	Loggerhead Shrike	0	1	0	0	0	0	0	2	0
17	Mourning Dove	0	0	0	0	0	0	0	0	0
18	Northern Cardinal	0	1	1	1	0	0	0	0	0
19	Northern Mockingbird	0	2	0	0	0	10	0	7	2
20	Red-Bellied Woodpecker	0	0	0	0	0	0	0	0	0
21	Red-Winged Blackbird	0	1	0	0	1	0	0	0	0
22	Ruby-Crowned Sparrow	0	0	0	0	0	0	0	0	0
23	Scissor-Tailed Flycatcher	0	0	0	0	0	1	0	0	0
24	Sharp-Shinned Hawk	0	0	0	0	0	0	0	0	0
25	Shiny Cowbird	0	0	0	0	0	0	0	0	0
26	Western Kingbird	0	0	0	0	1	0	0	0	0
27	White-Crowned Sparrow	0	0	1	0	0	0	0	0	0
28	Yellow-Headed Blackbird	0	0	0	0	3	0	0	0	0
29										
30	TOTALS	1	6	2	4	10	16	0	11	2

Figure 53. Breakdown of non-target species deaths.

intermediate sheet used during processing. Sheets 2 through 4 each contain a different summary analysis. Sheet 2 contains a table of captured GCWAs divided by sex and age. Sheet 3 contains a table of captured GCWAs divided by sex, region, and training area. Sheet 4 contains a table of captured male GCWAs divided by age and training area. Figures 54 through 56 show Sheets 2 through 4, respectively.

### 12.13 Male GCWAs Searched for and Found

GCWA\_2.XLS uses GCWA.DBF to generate a summary of all male GCWAs searched for and found. The output consists of one Excel sheet containing a list of male GCWAs found followed by a list of those not found. At the bottom is a percentage of male GCWAs found. Figure 57 shows an example.

### 12.14 GCWAs Returned From Previous Years

GCWA\_3.XLS uses SI\_RECAP.DBF to generate a summary of all GCWAs returning from previous years. The output consists of one Excel sheet containing a table of all returning GCWAs and their ages for each training area. Figure 58 shows an example.



Microsoft Excel - GCWA\_BND.DBF

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	A	B	C	D	E	F	G	H	I	J	K	L
1		SEX										
2	AGE	UNKNOWN	MALE	FEMALE	Grand Total							
3	AHY	0	12	4	16							
4	ASY	1	105	14	120							
5	HY	10	55	33	98							
6	L	3	0	0	3							
7	SY	0	91	15	106							
8	Grand Total	14	263	66	343							

Ready

Figure 54. Captured GCWAs by sex and age.

Microsoft Excel - GCWA\_BND.DBF

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	A	B	C	D	E	F	G	H	I	J	K	L	M
1			SEX										
2	REGION	TR AREA	UNKNOWN	MALE	FEMALE	Grand Total							
3	EARA	1	0	0	1	1							
4		11	0	0	1	1							
5		12	0	6	1	7							
6		13	10	86	36	132							
7		15	0	2	0	2							
8		16	0	9	2	11							
9		17	0	5	0	5							
10		18	0	6	2	8							
11		2	0	8	2	10							
12		3	0	15	1	16							
13		4	0	17	1	18							
14		5	0	13	3	16							
15		6	0	1	1	2							
16	EARA Total		10	168	51	229							
17	LF	65	3	1	0	4							
18	LF Total		3	1	0	4							
19	WEFH	22	0	3	1	4							
20		24	0	12	2	14							
21		27	0	1	0	1							
22	WEFH Total		0	16	3	19							
23	WERA	43	0	3	0	3							
24		44	1	32	5	38							
25		45	0	19	5	24							
26		48	0	9	1	10							
27		52	0	7	1	8							
28		53	0	8	0	8							
29	WERA Total		1	78	12	91							
30	Grand Total		14	263	66	343							

Ready

Figure 55. Captured GCWAs by sex, region, and training area.

Microsoft Excel - GCWA\_BND.DBF

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A3 TR AREA

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	MALE GCWAs												
2		AGE											
3	TR_AREA	ANY	ASY	HY	SY	Grand Total							
4	12	4	0	0	2	6							
5	13	1	18	42	25	86							
6	15	0	1	0	1	2							
7	16	0	6	0	3	9							
8	17	0	2	0	3	5							
9	18	2	0	3	1	6							
10	2	0	6	2	0	8							
11	22	1	0	1	1	3							
12	24	0	6	0	6	12							
13	27	0	0	0	1	1							
14	3	2	8	0	5	15							
15	4	0	9	2	6	17							
16	43	0	2	0	1	3							
17	44	1	16	2	13	32							
18	45	1	9	3	6	19							
19	48	0	5	0	4	9							
20	5	0	8	0	5	13							
21	52	0	5	0	2	7							
22	53	0	3	0	5	8							
23	6	0	1	0	0	1							
24	65	0	0	0	1	1							
25	Grand Total	12	105	55	91	263							
26													

Sheet3 / Sheet2 / Sheet1 / GCWA\_BND

Ready

Figure 56. Male GCWAs by age and training area.

Microsoft Excel - GCWA.DBF

File Edit View Insert Format Tools Data Window Help

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A1 REC NUMBER

	A	B	C	D	E	F	G	H	I
1	REC NUMBER	DATE	START	STOP	MINUTES	OBSERVER	TARG_OBS	TARG_BAND	TARG_NUMBR
2	1	09/01/95	09:42	09:43	1.00000	SM	False	1960	03766
3	3	09/11/95	11:05	11:25	20.00000	SM	False	1960	03798
4	8	09/16/95	13:55	14:30	35.00000	SM	False	1960	03631
5	14	09/23/95	07:54	08:13	19.00000	SM	False	1960	03782
6	20	09/30/95	15:11	15:30	19.00000	SM	False	1960	03760
7	Males Not Found						5		
8	2	09/01/95	09:47	09:48	1.00000	SM	True	1960	03709
9	18	09/06/95	10:45	11:06	21.00000	SM	True	1960	03719
10	22	09/09/95	14:52	15:12	20.00000	SM	True	1960	03748
11	23	09/11/95	16:21	16:45	24.00000	SM	True	1960	03657
12	24	09/15/95	15:05	15:55	50.00000	SM	True	1960	03700
13	30	09/20/95	06:54	07:42	48.00000	SM	True	1960	03788
14	35	09/24/95	11:00	11:34	34.00000	SM	True	1960	03683
15	39	09/29/95	12:07	12:54	47.00000	SM	True	1960	03769
16	Males Found						8		
17	Total Males Searched						13		
18	% of Males Found						61.54%		

Sheet1 / GCWA

Ready

Figure 57. Male GCWAs searched for and found.

Microsoft Excel - SI\_RECAP.DBF

File Edit View Insert Format Tools Data Window Help

A2 TR\_AREA Text Box

	A	B	C	D	E	F	G	H	I	J	K
1			SEX								
2	TR_AREA	AGE	MALE	FEMALE	Grand Total						
3	17	ASY	3	2	5						
4	17 Total		3	2	5						
5	3	ASY	1	0	1						
6	3 Total		1	0	1						
7	7	ASY	0	1	1						
8		SY	1	1	2						
9	7 Total		1	2	3						
10	Grand Total		5	4	9						
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											

Sheet1 SI\_RECAP

Adds unattached text or a textbox

Figure 58. GCWAs returned.

## 12.15 GCWA Dispersal Distance

GCWA\_4.XLS uses SI\_RECAP.DBF to generate a summary of average dispersal distances for all GCWAs returning from previous years. The output consists of three Excel sheets. Sheets 1-2 are intermediate tables used during processing. Sheet 3 contains a table of all returning GCWAs, how many dispersal distances were less than 500 meters, and average dispersal distance. Figure 59 shows an example of Sheet 3.

## 12.16 GCWAs Detected on Point Counts

GCWA\_5.XLS uses BIRD\_CNT.DBF to generate summary tables of GCWAs detected during point counts. The output consists of four Excel sheets. Sheet 1 is a simple table showing how many training areas had GCWAs in them. Sheet 2 is a table of all GCWAs seen per training area. Sheet 3 is a table of all GCWAs heard per training area. Sheet 4 is a table of all GCWAs seen and heard at each point. Figures 60 through 63 show examples of Sheets 1 through 4, respectively.

Microsoft Excel - SI\_RECIP.DBF

File Edit View Insert Format Tools Data Window Help

100%

	A	B	C	D	E	F	G
1	TR_AREA	SEX	NO. OF GCWAs	<=500M	AVERAGE DISPERSAL DISTANCE		
2	17	Male	3		811.0349935		
3		Female	2		559.5042689		
4	17 Total		5	1	710.4227036		
5	3	Male	1		211.4000946		
6	3 Total		1	1	211.4000946		
7	7	Male	1		605.0694175		
8		Female	2		621.3151567		
9	7 Total		3	0	615.8999103		
10	Grand Total		9	2	623.4681493		
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							

Sheet2 Sheet1 SI\_RECIP

Ready

Figure 59. GCWA dispersal distance.

Microsoft Excel - BIRD\_CNT.DBF

File Edit View Insert Format Tools Data Window Help

100%

	A	B	C	D	E	F	G	H	I	J
1	TR_AREA	Count								
2	13A	10								
3	13B	5								
4	2	7								
5	2A	8								
6	17A	4								
7	12B	1								
8	Total Number of Training Areas	35								
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										

Sheet4 Sheet3 Sheet2 Sheet1 BIRD\_CNT

Ready

Figure 60. Training areas containing GCWAs.

Microsoft Excel - BIRD\_CNT.DBF

File Edit View Insert Format Tools Data Window Help

100%

A2 TR AREA

	A	B	C	D	E	F	G	H	I	J	K
1		GCWAs SEEN									
2	TR AREA	FEMALE	MALE	Grand Total							
3	13A	1	2	3							
4	13B	0	3	3							
5	2	2	1	3							
6	2A	0	2	2							
7	17A	1	2	3							
8	Grand Total	4	10	14							
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											

Sheet4 Sheet3 Sheet2 Sheet1 BIRD\_CNT

Ready

Figure 61. GCWAs seen.

Microsoft Excel - BIRD\_CNT.DBF

File Edit View Insert Format Tools Data Window Help

100%

A3 TR AREA

	A	B	C	D	E	F	G	H	I	J
1	GCWAs HEARD									
2										
3	TR AREA	SEX	CALL	SONG	EST	DIST				
4	13A	F	TRUE		60.00000					
5		Female Total	1							
6	13A	M	TRUE	TRUE	30.00000					
7	13A	M	TRUE		10.00000					
8	13A	M	TRUE	TRUE	55.00000					
9		Male Total	3							
10	13B	M		TRUE	25.00000					
11		M	TRUE	TRUE	45.00000					
12		M	TRUE		15.00000					
13		Male Total	3							
14	17A	F	TRUE		80.00000					
15		Female Total	1							
16	17A	M	TRUE	TRUE	40.00000					
17	17A	M	TRUE	TRUE	75.00000					
18		Male Total	2							
19		Grand Total	10							
20										
21										
22	GCWAs Heard Inside 50 Meters	6								
23	GCWAs Heard Outside 50 Meters	4								
24										
25										
26										
27										

Sheet4 Sheet3 Sheet2 Sheet1 BIRD\_CNT

Ready

CAPS

Figure 62. GCWAs heard.

Microsoft Excel - BIRD\_CNT.DBF

File Edit View Insert Format Tools Data Window Help

100%

A4 ROUTE

	A	B	C	D	E	F	G	H	I	J	K
1	GCWAs SEEN AND HEARD										
2											
3			SEX								
4	ROUTE	POINT NUM	FEMALE	MALE	UNKNOWN	Grand Total					
5	1	1	1	0	0	1					
6		2	0	2	0	2					
7		3	0	0	1	1					
8	1 Total		1	2	1	4					
9	2	1	1	1	0	2					
10	2 Total		1	1	0	2					
11	3	1	1	2	0	3					
12		2	0	1	0	1					
13	3 Total		1	3	0	4					
14	4	1	0	2	0	2					
15		2	1	2	0	3					
16		3	1	2	0	3					
17		4	0	0	0	0					
18	4 Total		2	6	0	8					
19	5	1	0	1	0	1					
20		2	0	1	0	1					
21		3	1	1	0	2					
22		4	1	1	0	2					
23	5 Total		2	4	0	6					
24	Grand Total		7	16	1	24					
25											
26											
27											

Sheet4 Sheet3 Sheet2 Sheet1 BIRD\_CNT

Ready

Figure 63. GCWAs seen and heard.

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