

## N. American Bird Reference Book/LANIUS Excalibur Help

**LANIUS Software's North American Bird Reference Book™** is a multimedia program which is designed for anyone who has at least a general interest in nature, especially birds. With this program, you can learn about the basic life history of birds, including the habitat they use, where they are found, how to identify them, the nesting strategies they employ to raise their young, what they sound like, and what they look like.

[REFERENCE BOOK FORM](#)  
[INFLIGHT FIELD VIEWER](#)

The **LANIUS® Excalibur** application allows you to maintain detailed records and information about birds that you have seen. LANIUS Excalibur also keeps track of your "life list" and maintains records of the different sites you have visited when looking at birds. See the [OVERVIEW](#) section of this Help file for more information on the North American Bird Reference Book and LANIUS Excalibur.

[MAIN MENU OPTIONS](#)  
[CENSUS FORM](#)  
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[ENTERING SITE NAMES](#)  
LANIUS Excalibur's [BIRD INFORMATION CENTER](#)

To learn how to use Help, press F1 or select **How to Use Help ...** from the **HELP** pull-down menu on the Main Menu Form.

## What is LANIUS Excalibur?

**LANIUS® Excalibur, the Ornithological Database for the Natural World!**, is designed to store data about birds that you have observed throughout the world. Its primary purpose is to maintain detailed records of birds seen and sites visited by bird enthusiasts such as yourself. The database only operates on 32-bit Windows operating systems.

LANIUS Excalibur uses **James F. Clements'** (1991) world checklist of bird species names. This checklist provides a current listing of the nearly 9,700 species of birds recognized by modern-day ornithologists. Included in the book, for each species, is the scientific name, the best-known English name, and a description of the world-wide range of each bird.

## Database Organization

The LANIUS Excalibur database is organized in a hierarchical fashion but functions just like most relational databases you may be familiar with. Data within the database are stored in tables. The following 16 tables are included in LANIUS Excalibur:

<b>CONTINENT</b>	Records for the name of each of the continents on the Earth. Oceania (the collection of islands in the southern, western and central Pacific Ocean) is included here as well.
<b>COUNTRY</b>	Records for each of the major countries in the world. Each country is identified by its internationally recognized 2-letter ISO (International Organization for Standardization) code.
<b>MAJOR AREA</b>	Records for each <a href="#">Major Area</a> that is defined in the database.
<b>MAJOR AREA TYPE</b>	Records that define the "kind" of area that each Major Area represents.
<b>MINOR AREA</b>	Records for each <a href="#">Minor Area</a> that is defined in the database.
<b>MINOR AREA TYPE</b>	Records that define the "kind" of area that each Minor Area represents.
<b>SITE</b>	Records that define the name of each site that you visit in search of birds.
<b>SPECIES</b>	Records for each of the species that appear in James F. Clements' (1991) checklist of the birds of the world. The common and scientific name are included for each species.
<b>FAMILY</b>	Records for the name of each bird family, as recognized by James F. Clements (1991) in his checklist of the birds of the world.
<b>CENSUS</b>	Records that record the details (date, weather, observers, and site visited) of each census that you conduct.
<b>SIGHTING</b>	Records that record the details (number seen, remarks, location, etc.) of each bird observation.
<b>DOCUMENTATION</b>	Records for the Documentation of Rare Bird Sightings. Document your rare bird sightings in LANIUS Excalibur and print them out for submission to state, regional, or national compilers of ornithological data! All of the information normally requested on a Rare Bird Documentation Form is included in this table.
<b>LIST NAME</b>	Records for the names of the various species lists you use are stored in this table. Records for your Life List and North American List have been pre-entered into this table for you. LANIUS Excalibur allows you to create an unlimited number of additional lists. For more information on this topic, please see the <b>ADVANCED CONCEPTS</b> section in the User's Manual. Use these lists to <a href="#">define customized subsets of species names</a> that you can work with when entering data or generating reports. This way, you will never have to deal with scrolling through a list of over 9600 bird names.

**SPECIES LIST**

For each record you add to the [LIST NAME table](#), you can identify one or more species that belong to that list in the SPECIES LIST table. The North American species list (excludes Hawaiian species) has been pre-entered for you. LANIUS Excalibur allows you to create an unlimited number of additional lists. For more information on this topic, please see the **ADVANCED CONCEPTS** section in the User's Manual.

**SITE LOCATION**

Records that describe the geographic distribution of a site relative to one or more [Minor Areas](#) that have already been defined.

**LINK**

Records that define the [links \(area of overlap\)](#) that may exist between one or more sites.

## Tutorial and Registration

To register your software, click on the Main Menu's **HELP** pull-down menu and select **Registration Form ...** When the Registration Form is displayed, fill out the requested information, send it to your printer, and mail the output to LANIUS Software.

The written documentation for the North American Bird Reference Book is contained within three documents: a *tutorial*, the *user's manual*, and a *Summary and Key Steps of Data Entry*. These documents are located in the same directory in which the Reference Book was installed and may be printed out with WordPad or another word processor by accessing the Main Menu's **HELP** pull-down menu and clicking on **Print Out Written Documentation ...**; then click on the document of your choice. The program responds by opening up the selected document in a word processor, from which you can send the document to your printer.

For your convenience, the tutorial document (*TUTORIAL.DOC*) provides two introductory sessions for your use of the North American Bird Reference Book; the first section provides you with an overview of the use of the [Reference Book](#) itself, while the second section provides you with an in-depth overview of the use of the [LANIUS Excalibur 2000](#) bird sighting database which is included with the Reference Book. The entire tutorial may take you up to an hour or slightly longer to complete (approximately 25 minutes for section 1, 45 minutes for section 2). As you will likely use the North American Bird Reference Book database for years to come, this will be time well spent. **Note: if you are a previous user of LANIUS Excalibur 2.0, or if you are not interested in creating or maintaining a "Life List", then you will not have to take the second section of the tutorial.**

To start the second section of the tutorial (for LANIUS Excalibur 2000), access the **HELP** pull-down menu and click on **Start Excalibur Tutorial**. (To stop the tutorial at any time, repeat this procedure and click on **End Excalibur Tutorial**.) Note that after the tutorial has been started, a white label with red letters reminds you that the tutorial is currently active. You should turn the tutorial off before you begin to enter your own bird sighting data in earnest.

You should note that the tutorial accesses a database file that is separate from your normal database file. *If you ever want to experiment with the software program without compromising the integrity of your own personal bird sighting data, you can re-start the tutorial to make the tutorial database active.* To do this, simply access the **HELP** pull-down menu and click on **Start Excalibur Tutorial**.

LANIUS Excalibur presents a novel and revolutionary approach to bird sighting database management. Although the database is quite intuitive, we nevertheless strongly suggest that first-time users of the database take the Tutorial session (see the document titled *TUTORIAL.DOC*). Using the Tutorial is the best way to quickly grasp the key concepts of using LANIUS Excalibur.

## Major and Minor Areas

What are Major and Minor Areas?

A **Major Area** is a geographical unit of space that defines a large area of land. Think of a State (in the United States) as a Major Area. Major Areas are generally mutually exclusive of one another (i.e., they do not overlap one another).

A **Minor Area** is a geographical unit of space which represents a subdivision of a Major Area. Each Major Area may have one or more Minor Areas within it. Again, Minor Areas generally do not overlap one another. Think of a County (in the United States) as a Minor Area.

You can use Major and Minor Areas to organize your bird sightings hierarchically, within a geographic context.

## Sites

What are Sites?

A **Site** is a geographical unit of land that is visited in search of birds. Unlike Major and Minor Areas, Sites may overlap one another. [Defining sites](#) in LANIUS Excalibur is a three-step process.

## Starting the North American Bird Reference Book

To start the North American Bird Reference Book database, press the **Start** menu and navigate to the folder where the program was installed; use your mouse to click on **Reference Book 2000**. The application will start and you will be at the [Main Menu](#).



## Key Assignments

While using the North American Bird Reference Book and LANIUS Excalibur databases, you will be able to do many things in one or more ways, depending on how you like to use the computer keyboard, function keys, and your mouse. Simple actions which you may cause to happen in the Reference Book or in LANIUS Excalibur include committing a new or modified record to the database, deleting a record from the database, copying and cutting text, scrolling through records, accessing other forms or records, or performing queries. These and other actions may be performed in the North American Bird Reference Book or LANIUS Excalibur as described in Table 1 of your User's Guide. Press [F1] at any time to access this help file.

To work with the various aspects of the Reference Book and LANIUS Excalibur databases is as simple as pressing a function key, using an [ALT]-key combination, or clicking the mouse on an object on the screen. In brief, when an action or task (e.g., Delete a Record) has been assigned to one of the 12 function keys (F1 through F12), then you can simply press the appropriate function key to execute the desired action. Similarly, clicking on a button on a form may accomplish the same task. When the name of a button or menu option has an underlined letter (as the "u" in the word "underlined"), then pressing the letter while holding down the [ALT] key will also accomplish the task identified by that button or menu option.

## Data Control Bar

In each of the data entry forms you will find a data control bar. This bar can be accessed by the mouse and is used to move to the first, previous, next, or last record in the table.



To use the data control bar, click the mouse on one of the symbols. Clicking on the right arrow (->) will move to the next record, if one exists. To move to the last record in the table, click on the right arrow that is followed by a vertical bar (->|).

Clicking on the left arrow (<-) will move to the previous record, if one exists. To move to the first record in the table, click on the left arrow that is preceded by a vertical bar (|<-).

Note that pressing the [F7] or [SHIFT-F7] keys will also move to the next or previous record, respectively.

Records can also be accessed by using the [Find feature](#) on each of the data entry forms.

## Switching Tables

While using the Reference Form, you can access data for the reference tables that ship with LANIUS Excalibur. To switch between these tables, simply choose **TABLES** from the pull down menu on the screen and select the table of your choice. Any changes to an existing record must be saved or abandoned before you can switch to a new table.

## Entering Data

Because all data entry forms work in a similar fashion, a generic description of how to enter new records is provided below. This information can be applied on any of the data entry forms in the LANIUS Excalibur database. For a step-by-step summary of how to enter an entire set of data pertaining to one or more days of bird watching, see the [Summary and Key Steps of Data Entry](#).

To enter a new record, follow these six steps:

1. From the [Main Menu](#), choose the option that will access the desired form. Options available include:  
  
**ADD/EDIT RECORDS**--this option will take you to the [Census Form](#). From the Census Form, you can also access the Observation and Documentation Forms.  
**REFERENCE DATA**--this option will take you to the LANIUS Excalibur Reference Form, where you may add new (or edit existing) records for any of the associated reference tables that ship with the database.
2. **To add a new record, you must be at a blank screen.** Use the status message on the data control bar to determine if you are adding a new record.
3. If you are not at a blank screen, then a preexistent record is showing. To get to a blank screen, press the **Add New** button or the [F2] key. Pressing the **Add New** button will clear the previously entered record from the screen so that all available data entry fields will be empty or set to their default values.
4. **Enter the data in the appropriate data entry fields for the record you want to add.** Be sure to validate all data. Although the database will catch many errors, it is still possible that you may misspell certain words when entering data.
5. **Data must be entered in all fields that require a value!** Only those fields with a green background may be left blank. If data are not entered into all required fields, you will not be able to save the record.
6. You have two options to save the record: press the **Save** button or the [F3] key to save the record or press the **Add New** button or the [F2] key to save the record and to clear the screen in preparation for the entry of an additional record.

If you receive any error messages when executing Step 6, please consult the Error Messages listed in the user's manual for more information on how to correct the problem.

### Related Information:

[Preparing for Data Entry](#)

[Birding](#)

[Keep Field Notes](#)

[Transfer Records](#)

[Enter Your Records](#)

[Data Entry Strategies](#)

[Summary and Key Steps of Data Entry](#)

## Preparing for Data Entry

Birding has been described by some as a sport, by others as a hobby, and by a few as a job to be taken seriously. However, regardless of how one views birding, she or he is almost always likely to be astonished by the sheer number and variety of species that are observed by individuals who partake in this enjoyable pastime.

LANIUS Excalibur was developed for birders of all skill levels. As a result, depending on your interests, you may only want to enter a few records a month, or you may want to enter 500 or more records a month. In either event, the LANIUS Excalibur database will grow to meet your needs as you use it.

LANIUS Excalibur will even meet the needs of birders who wish to record all records of birds they have seen. However, if you are not so meticulous and do not wish to enter records for every bird that you see, it may be practical to just enter those records that are of most interest to you. Such records may include first state records for a species, first ever sightings of a species, early or late migrants, sightings of species in unusually high or low numbers or in unusual habitats or geographic locations, sightings of rare or endangered species, etc. In other words, to maximize your enjoyment of the database, you must decide how much and what kinds of data you want to place into the database.

Entering records into a database is much quicker, more useful, and better organized than writing records by hand into notebooks or maintaining a file of notes scrawled on daily field check-lists. *To simplify entry of records into the database, you will find it most useful to use a data entry form. Such a form is presented in Appendix B of your User's Guide.*

**(NOTE: THE IMPORTANCE OF USING A DATA ENTRY FORM CAN NOT BE OVER EMPHASIZED. THE TIME SAVED DURING DATA ENTRY AND THE BACKUP DOCUMENTATION THAT DATA ENTRY FORMS PROVIDE EASILY JUSTIFY THE SMALL AMOUNT OF TIME SPENT FILLING OUT THE FORM. YOUR USE OF THE LANIUS EXCALIBUR DATABASE CAN BE MADE MUCH EASIER BY USING A FORM. SEE YOUR USER'S GUIDE FOR INSTRUCTIONS ON HOW TO PREPARE AND USE A DATA ENTRY FORM.)**

What are the advantages of using a form? Well, there are several. First, the form allows you to easily make the association between your raw data and the data entry screens that appear on the computer terminal when you are using LANIUS Excalibur. Moreover, the species codes that you use are on the form, so you don't have to look them up elsewhere (of course, if using codes is not your preference, LANIUS Excalibur does provide other options for identifying species). Finally, these forms, in effect, represent your raw data. For this reason, filing them in a safe place after you have entered the records into the database provides you with a backup of your data should you ever have problems with your computer disk or experience data loss due to fire or theft.

LANIUS Excalibur obtains most of its power from how it organizes the data it is designed to handle. When we speak of birds that we see or have seen, we almost always describe such sightings by referencing the date when the observation took place or by identifying who made the observation. We also describe observations in terms of the places where the sightings occurred. This information is recorded in the CENSUS table.

For each record recorded in the CENSUS table, one or more sightings can be recorded for that census in the SIGHTING table.

If you have not already done so, it will be important to begin conceptualizing where,

geographically speaking, your bird sightings occur. This includes knowing what [Site](#) you visited in search of birds, and what [Major Area and Minor Area](#) that site occurred in. LANIUS Excalibur even allows you to record sightings for sites that occur in more than one Minor Area. For example, consider Rend Lake, which occurs in Franklin and Jefferson Counties, Illinois: on the same date (and census), you may have 5 Red-tailed Hawks in Jefferson County and 8 Red-tailed Hawks in Franklin County at this site. LANIUS Excalibur will allow you to enter these records separately, thereby retaining your ability to query for records by county and by site!

There are four easy steps to maintaining your records in a computer database. Depending on how many records you enter on a regular basis, and how you like to record your observations in the field, one or two of these steps can be combined or omitted.

These steps are:

1. [Go bird watching!](#)
2. [Keep Field Notes](#): Record the sites (including [Major and Minor Areas](#)) you visit, and note which bird species you observe. This may be done at regular intervals during the day, or at the conclusion of a period of birding, just before you return home; or you may find it is just as easy to do after you return home. Using a field check-list offered by a local or state bird club is one easy way to make notations of what sites you visit and which birds you see.
3. [Transfer Your Records to a Data Entry Form](#) similar to the one in Appendix B. If you wish, you can use a data entry form similar to the one in Appendix B as a field check-list, thus combining steps 2 and 3, and avoiding the transfer of data at the end of the day.
4. [Enter Your Records](#) into the computer using the data entry form as the source for all entered data.

## Birding

This step is self explanatory, and is probably the reason why you have purchased this database program. Suffice it to say that you should have fun while birding! Now let's look at step 2: [Keep Field Notes](#).

## Keep Field Notes

Be sure to record the name of each [Site](#) that you visit during the day. See [Data Entry Strategies](#) to learn how to make use of the General Location site that comes with LANIUS Excalibur; this site is useful for describing incidental sightings of birds that would otherwise not be assigned to one of your predefined sites.

In addition to describing the Site(s) that you visit, you will also need to note what species (and how many of each) you see during the day. This can also be done on a field check-list, if you use one. If you don't wish to record more than a handful of sightings for each day of birding, you may find the use of a check-list unnecessary. However, at the time of data entry you will somehow want to have some way of knowing which species need to be entered into the database, and for each species you will want to know the following items:

1. The [Major Area](#) in which it was found;
2. The [Minor Area](#) in which it was found;
3. How many individuals were seen within the Minor Area; and
4. Any special remarks that you feel are necessary to record (note: remarks are optional).

The first two items in the above list can generally be recorded once at the top of your field check-list. Moreover, as you enter records into the database using the Observation Form, remember that even if you observe 100 species in the same Minor Area in one day, you'll only need to identify the Major and Minor Area names once, for the first species; after that, for the following 99 species, LANIUS Excalibur will "remember" the Major/Minor Area combination that was entered and you will not have to re-specify these parameters, thus saving a tremendous amount of data entry work.

The last two items in the above list can generally be annotated adjacent to the specific species on your field check-list, if you use one. Some of this information may oftentimes be "in your head", meaning that while you may never write it down, you still remember it at the time of data entry.

There is one more situation to consider here, however, and that involves the case when you visit more than one Minor Area or Site in a day. Again, if you plan on entering only a handful of records for each day of birding, you may find the process described above sufficient for your needs, or even that the field check-list is unnecessary. However, if you plan on entering a significant portion of the birds you see, then it may be wise to keep separate check-lists for each Minor Area or Site you visit during the day. Other than having two or three check-lists (one for each Minor Area or Site) at the end of the day, you will find that the actual data entry is no different from the process described above.



## Transfer Records

It is strongly recommended that you use a data entry form to enter your sightings into the LANIUS Excalibur database. However, if you have already made a decision not to use a check-list or data entry form, then you can skip this section and proceed to the next step and begin entering data; at this point, all that you would need to know are the Species ID codes for each species you want to enter into the database.

If you decide to use a data entry form, and your data entry form also serves as your field check-list, then you can also skip this step (assuming your hand writing is usually legible) and begin entering data.

Transferring data about the birds you have seen during the day is not hard, and will only usually take a few minutes at most. Appendix B shows a sample data entry form that doubles as a field check-list for a hypothetical state in the USA; your finished product may look very similar to Appendix B, depending on how you prefer to prepare your data for entry into the database.

Data entry forms come in many formats, but there is always one overriding purpose for using them: to simplify data entry processes. One way to ensure that this objective is met is to have, on one form, all of the information you need in order to enter one or more records. Appendix B represents one such form. You can also [Prepare Your Own Data Entry Forms](#)).

Your data entry form, therefore, should include, in addition to the four items identified above under [Keep Field Notes](#), a Species ID code for each species you plan to enter. Note how Appendix B consolidates and organizes all of the data to be entered into the database for one day of activity. For any day of birding activity, this single form facilitates data entry into the SIGHTING table, as well as into the CENSUS table. Any form that you use should have similar capabilities.

## Enter Your Records

This is the last step to be completed for recording your records in the computer database. If you have previously kept hand written records of your bird sightings, you will be singularly impressed by the speed at which you can now enter an equivalent number of sightings into LANIUS Excalibur. After entering your records into the database, you should file your original data entry sheets in a safe place in the event you need to reference them at a later date.

## Data Entry Strategies

- ◆ Prior to using LANIUS Excalibur, you will want to spend some time thinking about the [Sites](#) that you visit most often in search of birds. Before entering actual observation data, these sites should be recorded in the SITE table, and [Links](#) should be established where necessary (see Appendix D for more information about linking sites). **Also, please note that you should avoid the temptation to create more sites than are necessary; indeed, it is important to remember that it is not necessary to create a site for every place that you have gone bird watching.** We encourage you to make frequent use of the General Location site, the use of which is described below.
  
- ◆ Prior to using the database, you should access the [Reports Menu](#) and run the BASIC reports that print out (to file) the names of Countries, Species, and the names for [Major and Minor Areas](#). (The database will prompt you for a name for each output file.) Although in most cases you will not need to know the Identification Codes for countries, species, and Major or Minor areas, you may on occasion have need to reference the information in these reports. Use your favorite word processor to open up the output files generated by these reports. You can use your word processor to search these files for specific information or to print selected pages on your printer. If you subsequently enter new or modify the names of existing countries, species, or Major/Minor Areas, be sure to re-run these reports to ensure that you have the latest information available. After you have created all of the Sites that you expect to use in the database, you can use the BASIC report called [List of Site Names](#) to print out the information (including Site ID codes) for each of your sites. Again, re-run this report after you update or revise the information pertaining to your Site data.
  
- ◆ When creating sites, it is advised that you spend some time thinking about the site called "General Location". This record should be assigned to all Major/Minor Area combinations:
  1. That you frequent on a regular basis; and
  2. Where you anticipate incidental sightings (that won't be specifically assigned to other sites) will be made.

The record for "General Location" ships with the LANIUS Excalibur database. It may be assigned to additional Major/Minor Area combinations as needed to account for birds seen at odd locations that won't be entered as a specific site in the database. There is no limit to the number of Major/Minor Area combinations that can be assigned to the General Location site record.

If the previous two paragraphs initially make no sense to you, review the following process outline and specific example for using the General Location site.

To assign the "General Location" record to one or more Major/Minor Area combinations, take the following steps:

1. From the Main Menu Form, press the **REFERENCE DATA** button.
2. The Reference Form will appear. If the record for "General Location" (ID Code 001) is not immediately on display, press **Find** and enter "General Location" at the prompt.
3. Press the **Places Where This Site is Found ...** button.
4. When the SITE LOCATION table data appears, specify a Major Area and corresponding Minor Area for each combination of Major and Minor Areas you wish to associate with the General Location site. For instance, if you are an Iowa birder and generally bird in Boone, Story, and Johnson Counties, then create three records for each of those counties. Press [F3] to save each record to the database; then press [F2] to create a new record.

As an example, consider the following scenario: you go bird watching at the Crab Orchard National Wildlife Refuge in Williamson County, Illinois, where you amass a total of 47 species. On your return trip home, you also find an American White Pelican 7 miles north of the refuge along Interstate-57. Obviously, you don't want to record the pelican as being seen on the same census (and therefore at the same site) that all of the other 47 species were recorded. To solve this problem, take the following simple actions:

1. Follow the four steps shown above to associate Williamson County, Illinois to the site for General Location.
2. Using the steps shown in the [ENTERING BIRD SIGHTING DATA](#) section of the tutorial, create a new census record and enter the records for the 47 species of birds found at Crab Orchard National Wildlife Refuge.
3. Press **Exit** to return to the Census Form.
4. Press [CTRL]-Z to create a new Census record by duplicating the fields of the current Census record.
5. Specify **General Location** as the name of the Site.
6. Using the steps shown in the [ENTERING BIRD SIGHTING DATA](#) section of the tutorial, enter the record for American White Pelican; in the Remarks section of this record, describe the precise location: **I-57, about 7 miles north of Crab Orchard National Wildlife Refuge.**
7. Press [F3] to save the record.

Why did we do this? Well, the only other alternative would have been to create a site for the location that is along I-57, about 7 miles north of the refuge. Imagine doing this for every bird you find at an odd location! You would quickly have more sites than you know what to do with, which explains our previous caution against creating more sites than are necessary.

World travelers may, for one reason or another, want to create a General Location site record for each continent in which they have recorded birds. Indeed, although it is not necessary, North American birders could also create a General Location site record (e.g., **General Location (GA)** for Georgia or **General Location (TN)** for Tennessee) for each state in which they have birded.

◆ When the Pick List Form is shown, it displays the species that are on your Default List. Before accessing the Census Form for the first time, you should ensure that the North American list is the default list (this is the default list unless you changed it after the installation was completed). This ensures that if the [Pick List Form](#) is used, there will at least be some species shown on that form

◆ When accessing the [Observation Form](#) for the first time, the default mode for identifying species will be by codes. You may want to automatically switch to the mode that allows you to identify species by common or Latin name (see the available user settings on the Observation Form). Begin by typing the name (common or Latin) of the species desired. The database will attempt to locate the name of the species using your input. In most cases, you will not have to type the entire name of the species you are searching for; to enhance the speed of data entry, the search is performed automatically while you are typing. As a result, if you have typed "Mal" for Mallard, you may only have to type an additional "l" to ensure that the search engine successfully finds "Mallard" in the database. Press [ENTER] to select the species.

**Note: your Default List will always be used to populate the list box with species names.** If you need to enter a bird sighting whose name is not on your Default List, simply access the **EDIT** menu, press **Edit User Settings ...** and click on **Invoke World List**. Follow these same steps and click on **Invoke Default List** when you want to restore your

Default List to the list box.

- ◆ You may want to record the same remarks for all or most of the bird sightings that were made in a day, but your default data entry mode is by picking species from a list (i.e., the Pick List Form). Under this scenario, you may want to only pick one species from the list when the Pick List Form is showing, press **OK** to access the Observation Form, enter a comment in the Remarks field for the current record, and use the [\[CTRL\]-R feature](#) (available from the **RECORDS** pull-down menu) to repeat these remarks for all additional bird sighting records.
- ◆ When using the Observation Form, you will in most cases not need to know the codes for the Minor Areas to which birds are assigned. However, after a record has been saved to the database, you may want to change the Minor Area to which the bird observation has been assigned. To do this, position the cursor on the Change Minor Area field and enter the ID Code for the Minor Area desired. Consult the report of Major and Minor Areas you generated earlier to obtain the ID Code for any Minor Area currently in the database.
- ◆ When multiple locations were visited on the same day, use the [\[CTRL\]-Z feature](#) (on the Census Form's **RECORDS** pull-down menu) to duplicate the most recently accessed record. Then choose a site name for the newly created record. Proceed to entering species records as you normally would.
- ◆ The database ships with the North America list (excludes Hawaiian species) included by default in the program. You can add an unlimited number of customized lists to the database. To do this, begin by first ensuring that the North American List is your default list. Then, run the BASIC report called [Create a Species Checklist](#). (The output is sent to a file.) Use your word processor to open this file and delete those names from the report that you don't want on your check-list, then print the check-list out on your printer. The codes for each species now appear to the left of the species names.

You can use this printed check-list to enter a customized check-list into the LANIUS Excalibur database. To do this, return to the Main Menu and select **REFERENCE DATA**. When the Reference Form is displayed, choose **List Names** from the **TABLES** menu. Press **Add New** and enter a unique ID code and name for your customized list. Then press [F3] to save the record. Next, click on **Add 1 or More Species to This List** from the **RECORDS** pull-down menu. Enter the codes, one at a time, from your printed field check-list. Now, return to the Main Menu Form, choose **Edit User Settings ...** from the **EDIT** menu, and change your default list to the name of your customized list.

## Summary of Key Steps of Data Entry

Prior to Data Entry, ensure that one or more [Sites](#) have been defined. To define a Site, press **REFERENCE DATA** from the Main Menu to access the Reference Form. Then follow the 3-Step Process for [Defining a New Site](#).

To enter a new record in the CENSUS table:

1. Enter the [Census Form](#) and access a blank record or screen. NOTE: *If any previous records exist in the CENSUS table, they will be displayed by default; therefore, press **Add New** or the [F2] key to clear the screen for data entry.* The Data Control Bar will now display the message "Adding Census Data".
2. Enter a date value in the Date field and press [ENTER].
3. Optionally, enter a description of the weather on this date in the Weather field and press [ENTER].
4. Optionally, enter the names or initials of the observers on this date in the Observers field and press [ENTER].
5. Select a name for the Site that was visited from the Site Name list box.
6. Press the [F2] key to add the record to the database and to automatically access the Observation Form.

(Note: if your user settings specify that you prefer to enter species by picking them from a list, then the Pick List Form will display immediately after Step 6 above. Instructions on [Entering Species With the Pick List Form](#) are provided.)

To enter a new record in the SIGHTING table:

1. Enter the [Observation Form](#) and access a blank record or screen.
2. Enter the Species ID code (or its common or Latin name, depending on your user settings) for the species of your choice and press [ENTER]; if necessary, allow LANIUS Excalibur to update your life list.
3. Enter the number of individuals for the species that were seen in the Number Seen field and press [ENTER].
4. Optionally, enter remarks about the sighting in the Remarks field and press [ENTER].
5. If necessary, select a Major Area for this observation from the Major Area field and press [ENTER].
6. If necessary, select a Minor Area for this observation from the Minor Area field and press [ENTER].
7. Press the [F2] key to add the record to the database.
8. If necessary, follow steps 2 through 7 to enter additional records for the date and census in question.
9. Press the [F11] key to return to the Census Form. When that form is displayed, your most recently accessed record will be on display. *To add another new set of records, you **MUST** first press the **Add New** button to clear the existing record from the screen.*

To document a rare bird sighting, navigate to a saved record in the Observation Form and select **Access Documentation Form** from the **FORMS** menu. Additional instructions are provided for [Documenting Rare Birds](#).

## Deleting Data

Because all data entry forms work in a similar fashion, a generic description of how to delete existing records is provided below. This information can be applied on any of the data entry forms in the LANIUS Excalibur database.

To delete a record, follow these three steps:

1. From the [Main Menu](#), choose the option that will access the desired form. Options available include:  
  
**ADD/EDIT RECORDS**--this option will take you to the [Census Form](#). From the Census Form, you can also access the Observation and Documentation Forms.  
**REFERENCE DATA**--this option will take you to the LANIUS Excalibur Reference Form, where you may add new (or edit existing) records for any of the associated reference tables that ship with the database.
2. **To delete a record, it must first be shown on the data entry screen.** To find an existing record, use the [Find button on the form \(if it is available\)](#) and **follow the instructions on the screen.** Alternatively, you may also use the [data control bar](#) to find an existing record.
3. **Once you have successfully located the desired record, press Delete** or the [F9] key. You will be prompted to confirm deletion of the record. Press **Yes** to delete the record or **No** to cancel the operation.

In general, you can follow the above steps when deleting records in all of the data entry forms of the LANIUS Excalibur database. However, note that there are several exceptions.

First, reference data records may only be deleted if the codes that identify these records are not used in other tables in the database. Secondly, deleting a record in the Census Form has a cascading effect on records in the SIGHTING table that have data for that census. ***In other words, deleting a record in the CENSUS table has a cascading effect on all of the records for the same Census in the SIGHTING table, resulting in the deletion of all associated records in that table.*** As a result, you should delete records from the Census Form with caution. To delete [individual](#) records only from the SIGHTING table, access the Observation form and follow the three steps above for deleting a record.

## Editing Data

Because all data entry forms work in a similar fashion, a generic description of how to edit existing records is provided below. This information can be applied on any of the data entry forms in the LANIUS Excalibur database.

To edit a record, follow these four steps:

1. From the [Main Menu](#), choose the option that will access the desired form. Options available include:  
  
**ADD/EDIT RECORDS**--this option will take you to the [Census Form](#). From the Census Form, you can also access the Observation and Documentation Forms.  
**REFERENCE DATA**--this option will take you to the LANIUS Excalibur Reference Form, where you may add new (or edit existing) records for any of the associated reference tables that ship with the database.
2. **To edit a record, it must first be shown on the data entry screen.** To find an existing record, use the [Find button on the form \(if it is available\)](#) and **follow the instructions on the screen.** Alternatively, you may also use the [data control bar](#) to find an existing record.
3. **Once you have successfully located the desired record, use the [ENTER] key, [TAB] key, or the mouse to move the cursor to the field(s) containing the value you want to change. Make all of the desired editing changes. Note that those fields that require a value (i.e., all fields with a blue background) should not be left blank; it is mandatory that such fields have values in them.**
4. **Press the Save** button or the [F3] key to save your changes to the database.

In general, you can follow the above steps when editing records in all of the data entry forms of the LANIUS Excalibur database. However, there is one exception: the Primary Key values for existing records in nearly all of the tables can not be modified. These records, when shown on the form, will not allow the values for these fields to be changed. This feature serves to maintain referential integrity within the database. **As a result, you will want to validate all data upon data entry to ensure that the information is correct.** This is especially true for reference data, the values of which will be referenced many times in the other tables of the database.

If you receive any error messages when executing Step 4 above, please consult the Error Messages listed in the manual for more information on how to correct the problem.



## Main Menu Options

The following choices are available from the MAIN MENU (note that some options are only available after you click on the **ADVANCED FEATURES** button):

[ACCESS THE REFERENCE BOOK](#)

[ADD RECORDS](#)

[REFERENCE DATA](#)

[REPORTS](#)

[EXIT DATABASE](#)

[EDIT USER SETTINGS](#)

[DISPLAY LIFE LIST TOTAL](#)



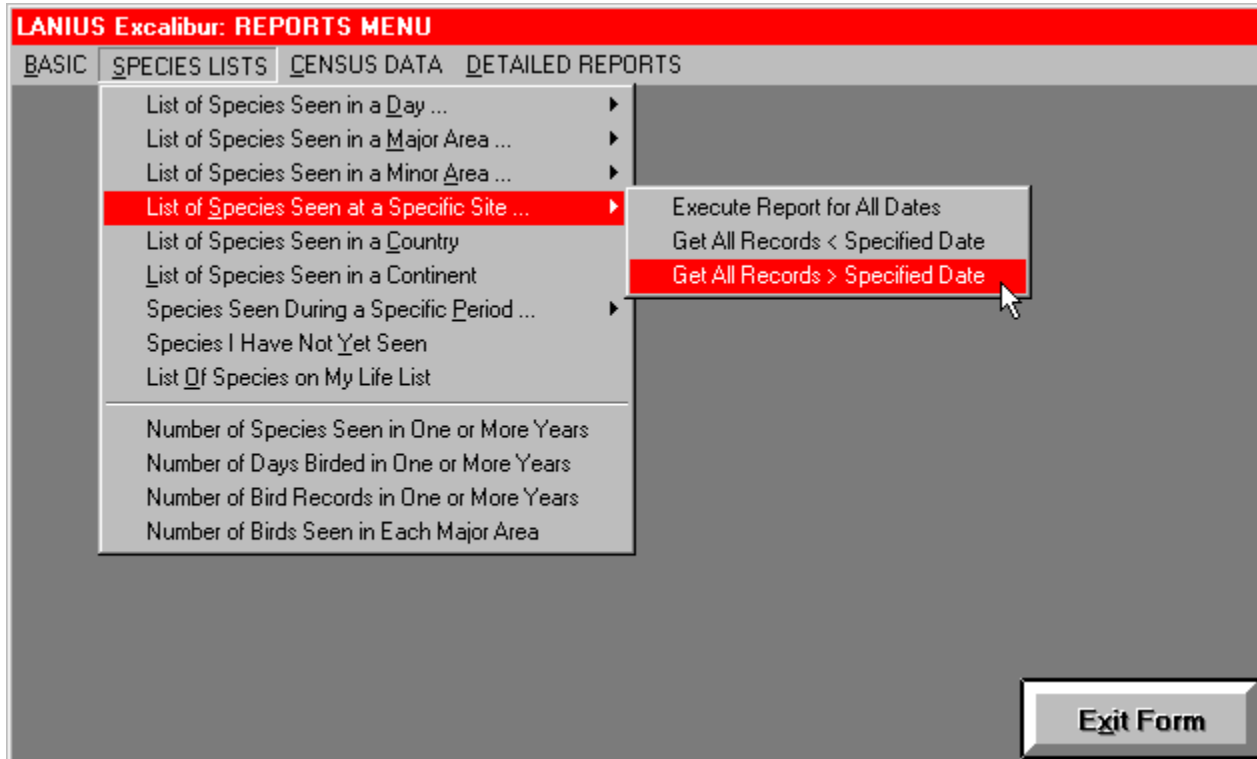
## Add Records

After clicking on the **ADVANCED FEATURES** button, you choose **ADD/EDIT RECORDS** from the [Main Menu](#) screen to add new bird sighting records to the database. You will want to review the steps used to [Prepare for Data Entry](#) to take full advantage of the LANIUS Excalibur database. Each set of records you add will consist of one record in the CENSUS table, and one or more records in the SIGHTING table.

## Reference Data

After clicking on the **ADVANCED FEATURES** button, you choose **REFERENCE DATA** from the [Main Menu](#) screen to edit any of the reference data located in the reference tables that ship with LANIUS Excalibur. By default, [The Reference Form](#) loads with the Site data showing. You can also access the data in the COUNTRY, MAJOR AREA, MAJOR AREA TYPE, MINOR AREA, MINOR AREA TYPE, SPECIES, FAMILY, SPECIES\_LIST, and LIST NAME tables from this form. See the discussion on [Switching Tables](#) to learn how to access the different reference tables in LANIUS Excalibur.

## Reports



After clicking on the **ADVANCED FEATURES** button, you choose **REPORTS** from the [Main Menu](#) screen to [generate](#) any of the varied reports that ship with the LANIUS Excalibur database. You will be taken to a screen from which you can choose to run Basic, Species Lists, Census Data, or Detailed reports. The output for many of the reports in LANIUS Excalibur can be sent to your monitor's screen, written to a [File on Disk](#), or sent to the printer connected to your computer.

To run these reports, perform the following:

1. Fill out the appropriate text boxes with valid values. Text boxes may prompt you for year or date values.
2. Next, select a [Major Area](#), [Minor Area](#), species, [Site](#), family, documentation record, and/or month from the appropriate list box.
3. Next, choose an output option, either file, printer, or screen.
4. Finally, choose **Run Report** to run the report, or press **Cancel Report** if you don't want to run the report.

If your report is sent to the screen, the output is displayed in a scrollable list box. When you are done viewing the data, press the [ESC] key to remove the display of data from the screen.

Some of the prompts you may see on the REPORTS Menu screen are shown below:

**LANIUS Excalibur: REPORTS MENU**

BASIC SPECIES LISTS CENSUS DATA DETAILED REPORTS

Enter a Range of Dates From: 3/1/1997 to: 5/31/1997

Execute Report For All Records At This Site: Mitchell Canyon

Run Report For All Records In This Major Area: California And Minor Area:

Execute Report For This Species: Loggerhead Shrike

Print Report To: Detailed Report for One or All Species

- Screen
- File

Cancel Report Run Report Exit Form

## Exit Database

You choose **EXIT DATABASE** from the [Main Menu](#) screen to close the North American Bird Reference Book database application and return to the operating system environment.

When you press **EXIT DATABASE**, you will be prompted to indicate whether you really want to close the database. Press **No** to continue running the Reference Book database. Press **Yes** to return to the operating system environment and close the North American Bird Reference Book database application.

## Edit User Settings (Main Menu)

To edit user settings from the [Main Menu](#), access the **EDIT** menu and click on **Edit User Settings ...**

The program responds by pulling up a tabbed dialog box where you can view or change the most important user settings in the program.

1. Note that your Default Species List is the **North American** (excluding Hawaiian species) list. To change this setting, click on the data control bar to access a different record. Note that there are over 9600 species names in the database. Your Default Species List controls what species names are on display whenever you access a list of species in the program. The default list allows you to focus on a specific subset of the more than 9600 species names that are included with the program.
2. Press the **Documentation Info** tab. This setting controls how your name and other information is recorded on the [Rare Bird Documentation Form](#) that LANIUS Excalibur can produce for you when you want to document a rare or vagrant bird sighting. If you have not done so yet, take a moment here to fill in the blanks for your name, address, phone number, and E-mail address.
3. Press the **Data Entry Mode** tab. By default, your data entry mode is to select species from a list (using the [Pick List Form](#)). Alternatively, you could enter species one at a time using the [Observation Form](#); to do this, click on the option to **Enter Species Records One at a Time**.
4. Press the **CD Drive** tab. If the Drive letter for your CD-ROM or DVD drive is correct (by default, it is set to "D"), then you need not do anything; otherwise, change the Drive letter for your CD-ROM to the correct value (e.g., "E", "F", or "G", depending on your computer's configuration).
5. If you made any changes to your user settings and you want to keep those changes, press the **OK** button.
6. Your new settings are now saved.

### Related Information:

[Display Life List Total](#) on the Main Menu Form

## Census Form

When the Census Form is showing, you can begin entering data pertaining to one or more censuses. Each census will include one or more bird sightings.

Specific features on the Census Form include:

[DUPLICATING A RECORD](#)

[ACCESSING THE OBSERVATION FORM](#)

The screenshot shows a software window titled "LANIUS Excalibur: CENSUS FORM". The window has a menu bar with "RECORDS" and "FORMS". Below the menu bar, there are several input fields and buttons. The "Select Site->" field is a dropdown menu with "Mitchell Canyon" selected. The "Date:" field contains "5/2/1997" with a format hint "(m/d/yyyy)". The "Weather:" field contains "Overcast, rain, calm, 40 Deg". The "Observers:" field contains "Jeremy S. Wilson". Below these fields is a red bar with "Editing Census Data" and navigation arrows. At the bottom, there are five buttons: "Add New", "Find", "Save", "Delete", and "Exit". A green button labeled "Access Observation Form" is highlighted with a white border.

Field	Value
Select Site->	Mitchell Canyon
Date:	5/2/1997 (m/d/yyyy)
Weather:	Overcast, rain, calm, 40 Deg
Observers:	Jeremy S. Wilson

Editing Census Data

Add New Find Save Delete Exit

Access Observation Form



## Duplicating a Census Record

There will be times that the same information (other than Site Name) needs to be recorded for two or more records in the CENSUS table. To duplicate a census record, take the following actions:

1. While using the [Census Form](#), locate a **preexistent, saved** record in the CENSUS table.
2. Press [CTRL]-Z to duplicate this record.
3. A message will display that you are now adding a new, unsaved record to the database. The record will be a duplicate of the most recently accessed record except that no Site will be identified for this record.
4. Select a Site in the Site Name list box.
5. Press the [F2] key to add the record to the database and access the Observation Form.

Note that if you have two or more censuses for the same day to add to the database, you can access the Census Form after entering your bird sightings for the first census in the Observation Form. At this point, you will be returned to the saved record in the Census Form for which you just added bird sightings. To duplicate this record (and begin adding bird sightings for a different census on the same day) press [CTRL]-Z (see step 2, above).

## Access Observation Form From Census Form

To access the [Observation Form](#) from the [Census Form](#), you must first find a previously saved record in the Census Form. Once the record has been found, press the **Access Observation Form** button or the [F4] function key to access the Observation Form. Access to other forms is not allowed if changes to the current record have not been saved.

## Pick List Form

When the Pick List Form is showing, you can select which species were seen on the census for which data is being entered. After you have chosen all of the species that were seen on the census in question, press the **OK** button to access the Observation Form.

Specific features on the Pick List Form include:

[SELECTING A MINOR AREA](#)

[SELECTING SPECIES](#)

[EDIT USER SETTINGS](#)

**LANIUS Excalibur: Species Pick List Form**  
05/03/1997--Mitchell Canyon

Pick one or more species from the list below, then press "OK" to en

Common Black-Hawk***734	Gyrfalcon***866
Harris' Hawk***738	Peregrine Falcon***867
Gray Hawk***742	Plain Chachalaca***871
Roadside Hawk***744	Himalayan Snowcock***953
Red-shouldered Hawk***745	Chukar***957
Broad-winged Hawk***747	Grey Partridge***1004
Short-tailed Hawk***749	Common Pheasant***1089
Swainson's Hawk***751	Blue Grouse***1105
White-tailed Hawk***752	Willow Ptarmigan***1106
Zone-tailed Hawk***756	Rock Ptarmigan***1107
Red-tailed Hawk***758	White-tailed Ptarmigan***1108
Ferruginous Hawk***765	Ruffed Grouse***1115
Rough-legged Hawk***766	Sage Grouse***1116
Golden Eagle***783	Spruce Grouse***1117
Crested Caracara***815	Sharp-tailed Grouse***1118
Eurasian Kestrel***835	Greater Prairie-chicken***1119
American Kestrel***841	Lesser Prairie-chicken***1120
Aplomado Falcon***852	Wild Turkey***1121
Merlin***853	Mountain Quail***1126
Eurasian Hobby***855	Scaled Quail***1127
Prairie Falcon***862	California Quail***1129

Prompt for # of Birds Seen

OK Exit

## Selecting a Minor Area in the Pick List Form

When you are entering data for a [Site](#) that occurs in more than one [Minor Area](#) , you need to specify the Minor Area to which the selected birds will be assigned. Choose the Minor Area of interest from the list box when it is shown at the top of the Pick List Form. The list box will not be shown for sites that only occur in one Minor Area. It is suggested that you select the Minor Area before you begin selecting which species were seen.

After all of the species that were seen in a particular Minor Area have been selected, press the **OK** button to add the observations to the SIGHTING table. LANIUS Excalibur will respond by prompting you to add records for a different Minor Area at this site: if you would like to add more records, answer **Yes**; otherwise answer **No** to proceed to the Observation Form.

## Selecting Species in the Pick List Form

The list box in the [Pick List Form](#) shows those species that are on your Default List. When entering data for a specific census, you access this form after pressing [F2] on the Census Form while adding a new record.

To use this list box, take the following steps:

1. Click on the species of your choice.
2. If the next species that was seen is not on display, use a mouse to scroll to the right until the next species to be chosen is on display (all species are in the sequence identified in Clements' (1991) world list).
3. Click on the next species.
4. Repeat steps 2-3 until all of the species that were seen on the day in question have been chosen.

Note: there is no need to hold the [CTRL] key down while selecting the species that were seen on the particular date and census in question.

After all of the species that were seen on this date and census have been selected, press the **OK** button to access the Observation Form.

## Edit User Settings in the Pick List Form

When the [Pick List Form](#) is showing, you can tell LANIUS Excalibur to prompt you for the number of individuals seen (this is the default setting). To do this, check the **Prompt for # of Birds Seen** box in the lower left hand corner of the form. To have LANIUS Excalibur enter "1" as the default value for number seen for all records that you enter, clear the **Prompt for # of Birds Seen** check box. Any changes to this setting are only valid for the current data entry session.

## Observation Form

When the Observation Form is showing, you can add or edit bird sighting records for species that were observed on a particular census.

Specific features on the Observation Form include:

[ACCESSING THE DOCUMENTATION FORM](#)

[LIST OF SPECIES NAMES](#)

[EDIT USER SETTINGS](#)

[REPEAT COMMENTS](#)

[CHANGING MINOR AREA](#)

[INVOKING WORLD/DEFAULT SPECIES LIST](#)

**LANIUS Excalibur: OBSERVATION FORM**

RECORDS EDIT FORMS

05/02/1997--Mitchell Canyon

Common Name: American Avocet 1498

American Avocet -- *Recurvirostra americana*

Number Seen: 1

Remarks:

Major Area: California

Minor Area: Contra Costa

Change Minor Area --> 2900

Editing Observation Data

Add New Find Save Delete Exit

Access Census Form

## Accessing the Documentation Form

To access the [Documentation Form](#) from the Observation Form, you must first find a previously saved record in the Observation Form. Once the record has been found, press the [F4] function key to access the Documentation Form. Access to other forms is not allowed if changes to the current record have not been saved.



## List of Species Names in the Observation Form

When entering data in the [Observation Form](#), you may need to know the Species ID code for a particular species; if you are entering species using codes from a [Data Entry Form](#) that you have prepared, you will find that all of the species ID codes are already listed for you.

If you do not prefer to use a data entry form or to enter species records using ID codes, you can [Edit the Settings](#) in the Observation Form to allow you to identify species using the common or Latin name of the bird. When this is done, a list of the common (or Latin) names will be displayed. You can control whether this list contains all of the species in the database or just the birds on your Default List.

When the list is shown, type or highlight the name of the species that you want and press [ENTER]. Press [ESC] when, for any reason, you want to avoid the process of selecting a species name from the list.

## Edit User Settings in the Observation Form

When accessing the [Observation Form](#) for the first time, the default mode for identifying species will be by codes. You may want to automatically switch to the mode that allows you to identify species by common or Latin name. To do this, access the **EDIT** menu, click on **Edit User Settings...** and then select **Specify Species by Typing Common (or Latin) Name**. From now on, the database will expect you to type the common (or Latin) name into this field to identify species when using the Observation Form. Begin by typing the name (common or Latin) of the species desired. The database will attempt to locate the name of the species using your input. In most cases, you will not have to type the entire name of the species you are searching for; to enhance the speed of data entry, the search is performed automatically while you are typing. As a result, if you have typed "Mal" for Mallard, you may only have to type an additional "l" to ensure that the search engine successfully finds "Mallard" in the database. Press [ENTER] to select the species.

[Separate Instructions](#) are provided for controlling whether this list contains all of the species in the database or just the birds on your Default List.

## Repeating Comments in the Observation Form

You may occasionally find that many of the species seen in a single day of birding need to have the same comment recorded for each record. You can program LANIUS Excalibur to repeat the same comment for each new record added to the SIGHTING table. To do this, take the following actions.

1. Access the [Observation Form](#).
2. While editing an existing record or while adding a new record, enter a comment into the Remarks field (comments must consist of one or more characters).
3. Press [CTRL]-R.

When you press [CTRL]-R, the label for the Remarks field changes to "Repeat Remarks:". Now, for any new record you add to the SIGHTING table for the census in question, the same comments you just typed into the Remarks field will be displayed in that field as a default value. Please note that this feature is turned off whenever you exit the Observation Form. To turn this feature off while using the Observation Form, simply press [CTRL]-R again.

## Documentation Form

When the Documentation Form is showing, you can add or edit records that provide detailed documentation of rare bird sightings.

Please note that while this form can be used to record practically all that is needed in order to document a rare bird sighting, some Rare Bird Records Committees encourage you to submit a separate narrative or materials (e.g., photographs or sound recordings) if there is additional information about the rare bird you found which can not be recorded within the format of LANIUS Excalibur's Rare Bird Documentation Form.

Specific features on the Documentation Form include:

[PRINTING A DOCUMENTATION RECORD](#)  
[USING THE DOCUMENTATION FIELD EDITOR](#)  
[EDIT USER SETTINGS](#)

LANIUS Excalibur: DOCUMENTATION FORM				
RECORDS	EDIT			
Species ID Code:	1498	American Avocet		
Date:	5/2/1997	Range of Dates:		
#, Age, Sex:				
Location:				
Time Found:		Duration:		
Habitat:				
Description:				
Vocal/Behavior:				
Similar Species:				
Other Observers:				
Experience:				
References:				
Optics:		Distance:		
Light/Weather:				
Name:	Jeremy S. Wilson	Phone #:	510-933-4561	
Address:	1427 Wilson Pl., Concord, CA 94756	E-Mail:	jsw@compuserve.com	
[F12] = Field Editor for dark blue fields				
Adding Documentation Data				
Add New	Find	Save	Delete	Exit

## Printing a Documentation Record

When the Documentation Form is showing, you can press [CTRL]-P to print the record that is currently on display. If you are in the process of adding a new record or editing an existing record, this function will be unavailable. The output of this report is sent directly to your printer.

## Using the Documentation Field Editor

Multiple lines of text (i.e., a carriage return) may be entered in those fields (on the [Documentation Form](#)) with a dark blue background by pressing the [CTRL-ENTER] key. By default, the height of these fields only allows you to see one line of text at a time. You can view additional lines of text by pressing the up- or down-arrow.

To view all of the text in the field at one time, you may want to access the Documentation Field Editor. To do this, position the cursor in the field (dark blue text boxes only) of your choice and press [F12].

When the Documentation Field Editor is displayed on the screen, you may edit the text by deleting, adding, or changing one or more characters, words, sentences, or paragraphs.

Text automatically wraps when it reaches the right edge of the Documentation Field Editor. To insert a carriage return in the field, simply press [CTRL-ENTER]. To complete the editing process, simply press the **Accept These Edits** button or press [ENTER].



## Edit User Settings in the Documentation Form

When the [Documentation Form](#) is showing, you will notice that the fields for Name, Phone #, Address, and E-Mail display the default settings that were identified by you during the current (or a previous) database session. To change these settings, simply access the **EDIT** menu and click on **Edit User Settings....**

You will be prompted to specify new settings for these four database fields. One or more characters must be specified for all fields except the Phone # and E-Mail fields.

The new settings will take effect immediately if you are in the process of adding a new record; otherwise, the database will wait until you begin creating a new Documentation record before using the new settings.

## Reference Form, Part 1

When the Reference Form is showing, you can edit or access any of the reference tables included with LANIUS Excalibur. Although 12 different reference tables are accessible from the Reference Form, [Switching to a Different Table](#) is easy.

When the Reference Form is first displayed, the data set for the SITE table will be on display. [Separate Instructions](#) are provided for adding new sites to the database.

LANIUS Excalibur Reference Form

RECORDS TABLES

Site ID Code: 003

Name of Site: Scott Valley

Places Where This Site is Found . . .

Linkages for This Site . . .

**Creating a New Site: Step 1**

Current Table: Site

Add New Find Save Delete Exit

Other features on the Reference Form covered in this help topic include:

[THE LIST NAME TABLE](#)  
[UPDATE LIFE LIST FUNCTIONS](#)  
[INVOKING WORLD/DEFAULT SPECIES LIST](#)  
[MAJOR AND MINOR AREAS](#)



## Using the List Name Table

The database ships with the North America list included by default in the program. You can add an unlimited number of customized lists to the database. To do this, begin by first ensuring that the appropriate Default List has been selected (see [Main Menu Settings](#) for more information). Then, run the BASIC report called **Create a Species Check-list** (the output of this report is sent to a file of your choice). Use your word processor to open this file and delete those names from the report that you don't want on your check-list, then print the check-list out on your printer. The codes for each species now appear to the left of the species names.

You can use this printed check-list to enter a customized checklist into the LANIUS Excalibur database. To do this:

1. Return to the Main Menu and select **REFERENCE DATA**.
2. When the Reference Form is on display, choose **List Names** from the **TABLES** menu.
3. Press **Add New** and enter a unique ID code and name for your customized list. Then press [F3] to save the record.
4. Next, click on **Add 1 or More Species to This List** from the **RECORDS** pull-down menu.
5. Following the instructions on this screen, enter the codes from your printed field checklist.
6. Now, return to the Main Menu Form, choose **Edit User Settings ...** from the **EDIT** menu, and change your default list to the name of your customized list.

NOTE: An alternative to the above instructions for entering a customized checklist into the database is to [Import a List](#) using a file that contains the codes of the species that you wish to place on your customized checklist.

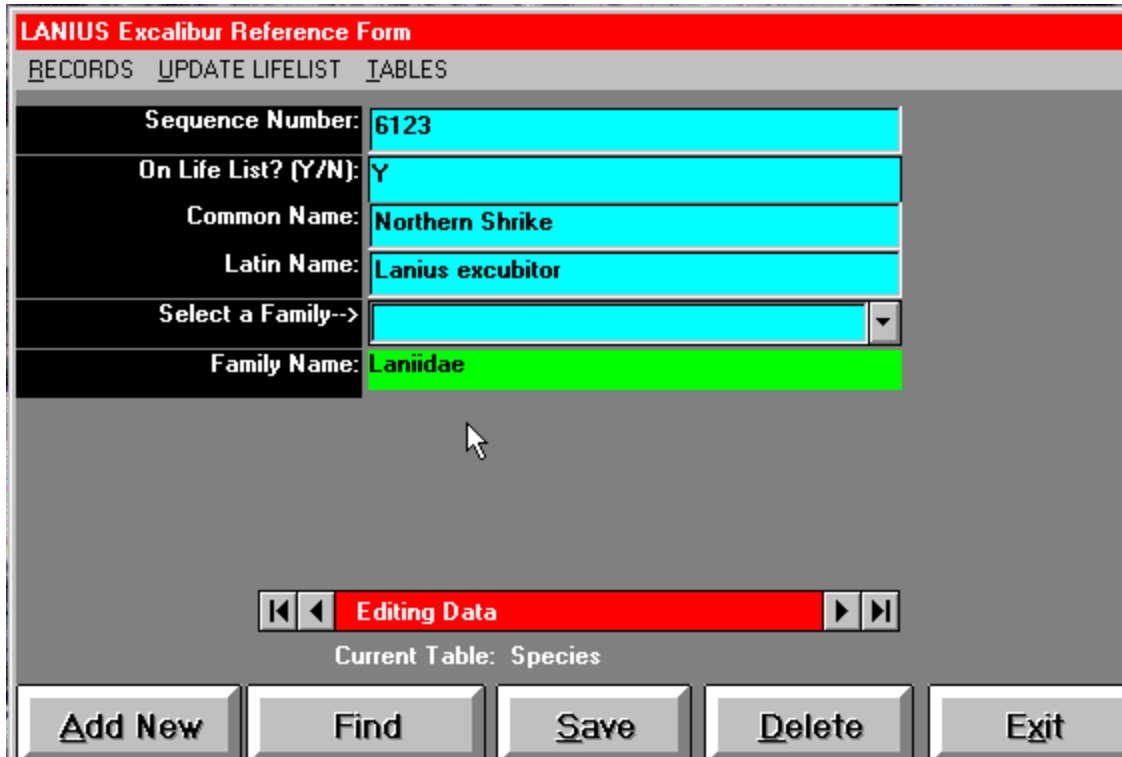
## Reference Form, Part 2

When the Reference Form is showing, you can edit or access any of the reference tables included with LANIUS Excalibur. Although 12 different reference tables are accessible from the Reference Form, [Switching to a Different Table](#) is easy.

Specific features on the Reference Form covered in this help topic include:

[UPDATE LIFE LIST FUNCTIONS](#)

[INVOKING WORLD/DEFAULT SPECIES LIST](#)



The screenshot displays the 'LANIUS Excalibur Reference Form' interface. At the top, a red header bar contains the title. Below it, a menu bar includes 'RECORDS', 'UPDATE LIFELIST', and 'TABLES'. The main data area consists of several fields: 'Sequence Number' (6123), 'On Life List? (Y/N)' (Y), 'Common Name' (Northern Shrike), 'Latin Name' (Lanius excubitor), 'Select a Family-->' (a dropdown menu), and 'Family Name' (Laniidae). A mouse cursor is positioned over the 'Family Name' field. At the bottom, a red bar indicates 'Editing Data' with navigation arrows. Below this, the text 'Current Table: Species' is visible. The interface concludes with five buttons: 'Add New', 'Find', 'Save', 'Delete', and 'Exit'.

Field	Value
Sequence Number:	6123
On Life List? (Y/N):	Y
Common Name:	Northern Shrike
Latin Name:	Lanius excubitor
Select a Family-->	[Dropdown]
Family Name:	Laniidae

Editing Data

Current Table: Species

Add New Find Save Delete Exit

## Update Life List Functions

When the [Reference Form](#) is showing, and the data for the SPECIES table is on display, you have access to several powerful features that are accessible from the **UPDATE LIFELIST** menu. These features are discussed below.

1. The [F8] key is used to toggle the On Life List field from "Y" to "N". When the record for a specific species is showing, use this feature to quickly update your Life List. Although LANIUS Excalibur maintains your Life List for you as you input data, there may be times when you need to modify the record for a particular species in the SPECIES table due to a data input error or to accurately reflect the species that are on your Life List but which have not yet been entered into the database.

If you have been bird watching for some time, you will certainly want to have the database recognize how many species are on your life list; however, you may not want to spend the time to enter specific database records for all of the birds you have seen over the years. The solution is to perform a **one-time update** of your life list, using the following steps:

- a. At the Main Menu, validate that your Default List is the North American list (access the **EDIT** menu and click on **Edit User Settings ...** to validate or change your Default List setting).
  - b. Press **REFERENCE DATA** to access the Reference Form.
  - c. Select the **TABLES** pull-down menu and click on **Species Names**. You will be at the first of over 9600 species records.
  - d. Select **Invoke Default List** from the **UPDATE LIFELIST** menu (this shortens the list to about 900 species).
  - e. Look at the **On Life List? (Y/N)** field. If you have seen this species but the value of this field is "N", simply press [F8] to change the value to "Y" (this adds it to your Life List).
  - f. Press [F7] to access the next record in the table.
  - g. Perform steps e and f until you reach the end of the species list (this may take about 30-40 minutes).
  - h. Press **Exit** to return to the Main Menu.
  - i. Now use the database to enter all of the bird sightings you make from this day forward; LANIUS Excalibur will automatically update your Life List whenever you enter the first record of a species that is not currently on your Life List!
2. Whenever a species is split into two or more species, it may become necessary to update your database and your Life List. The **Species Split Function** is provided with the database to ensure that you can keep up with changes in the taxonomic nomenclature of bird species. See the user's manual for detailed information on the use of the Species Split Function.
  3. Whenever two or more species are merged into one species, it may become necessary to update your database and your Life List. The **Species Merge Function** is provided with the database to ensure that you can keep up with changes in the taxonomic nomenclature of bird species. See the user's manual for detailed information on the use of the Species Merge Function.

## Reference Form, Part 3

When the Reference Form is showing, you can edit or access any of the reference tables included with LANIUS Excalibur. Although 12 different reference tables are accessible from the Reference Form, [Switching to a Different Table](#) is easy.

Specific features on the Reference Form covered in this help topic include:

[Major and Minor Areas](#).

The screenshot shows the LANIUS Excalibur Reference Form interface. At the top, there is a red header bar with the text "LANIUS Excalibur Reference Form". Below the header, there are two tabs: "RECORDS" and "TABLES". The main area of the form contains several input fields and dropdown menus. The "Major Area Name" field is set to "Iowa". The "Select a Country-->" dropdown menu is open, showing "United States of America" selected. The "Select a Major Area Type-->" dropdown menu is also open, showing "State" selected. Below these fields, there is a red bar with the text "Editing Data" and navigation arrows. Underneath, it says "Current Table: Major Area". At the bottom of the form, there are five buttons: "Add New", "Find Next", "Save", "Delete", and "Exit".

## Specifying Name of Output File

When preparing any report that is to be written to disk, a **Save Report As ...** dialog box will appear on the screen. To use this dialog box, select the drive and/or directory where you want to send the output file. By default, the REPORTS subdirectory of the LANIUS Excalibur application is active when you enter this input form.

To specify a file name, you may choose the name of a previously created file, if one exists. Otherwise, you have the option of typing the name of a new file in the **File name** box.

Note that if you choose the name of a previously created file, then the LANIUS Excalibur database will overwrite the contents of that file with the information contained in the report that is currently being prepared.

After specifying a file name, press **Save** to complete the report; to abandon the report creation process, press **Cancel**.

## Generating Reports

Some of the reports you create may be written to a [File on Disk](#).

When the Reports Menu Form is showing, you can generate any of the following reports. Those reports that display a list of bird species will place the species in the sequence order identified by Clements (1991) in his world list.

### Basic Reports

[Year to Date Total of Species Seen](#)  
[Life List Total](#)  
[Maximum Number Seen for a Species](#)  
[Number of Species Seen in a Minor Area](#)  
[List of Country Names](#)  
[List of Major and Minor Areas](#)  
[List of Species Names](#)  
[List of Site Names](#)  
[Create a Species Checklist](#)

### Species Lists Reports

[List of Species Seen in a Day](#)  
[List of Species Seen in a Major Area](#)  
[List of Species Seen in a Minor Area](#)  
[List of Species Seen at a Specific Site](#)  
[List of Species Seen in a Country](#)  
[List of Species Seen in a Continent](#)  
[Species Seen During a Specific Period](#)  
[Species I Have Not Yet Seen](#)  
[List of Species on My Life List](#)  
[Number of Species Seen in One or More Years](#)  
[Number of Days Birded in One or More Years](#)  
[Number of Days Birded By Minor Area Within a Selected Major Area](#)  
[Number of Bird Records in One or More Years](#)  
[Number of Birds Seen in Each Major Area](#)

### Census Data Reports

[Census Data for a Specific Date](#)  
[Census Data for a Range of Dates](#)  
[List of Dates a Specific Site Was Visited](#)  
[List of Dates a Specific Observer Was Present](#)

### Detailed Reports

[All Records for a Specific Family](#)  
[All Records for One or All Species](#)  
[Query Remarks Field in Observation Form](#)  
[All Records for a Specific Month](#)  
[Early and Late Migration Dates for a Species](#)  
[Print Documentation for a Rare Bird Sighting](#)

## Year to Date Total of Species Seen

What this report does: This report calculates and returns the number of different bird species you have seen during the current year.

Options: you can also calculate the number of different bird species you have seen during the current year in a specific [Major Area](#) by selecting the Major Area in question from a list.

Output: The output for this report is sent to the screen only.

## Life List Total

What this report does: This report calculates and returns the number of different bird species on your life list.

Options: you can also display your Life List total on the Main Menu Form; [specific instructions](#) on how to do this are provided.

Output: The output for this report is sent to the screen only.



## Maximum Number Seen for a Species

What this report does: This report calculates and returns the maximum number of individuals you have seen in one day for a species which you specify when you execute the report. The date of the observation is included as part of the report.

When you run this report, the largest number of individuals seen for the chosen species will be displayed on the screen. If two or more observations of the same species are recorded on the same day, the database will look at the sum total of those observations to determine if they represent the maximum number seen for the species in question.

Output: The output for this report is sent to the screen only.

## Number of Species Seen in a Minor Area

What this report does: This report calculates and returns the number of different bird species you have seen in a [Minor Area](#) that is specified by you when you execute the report.

Options: you can also calculate the number of different bird species that you have seen in a Minor Area before or after a certain date.

Output: The output for this report is sent to the screen only.

## List of Species on My Life List

What this report does: This report creates a list of species that are on your Life List. Included in the report will be the common and scientific name for each species on your Life List. The species are listed in the sequence identified in Clements' (1991) world list.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## List of Country Names

What this report does: This report creates a list of all the countries that are entered into the COUNTRY table. Included in the report is the country's unique ISO (International Organization for Standardization) code, the name of the country, and the continent that the country is found in.

Output: The output for this report is only sent to a [File on Disk](#).

## List of Major and Minor Areas

What this report does: This report creates a list of all the [Major and Minor Areas](#) that are defined in the MAJOR AREA and MINOR AREA tables. The ID Code for each Minor Area is included in the report.

Output: The output for this report is only sent to a [File on Disk](#).

## List of Species Names

What this report does: This report creates a list of all the species that are entered into the SPECIES table. Included in the report is the common name, Latin name, family name, sequence code, and Species ID code for each species. The sequence and taxonomy of the species names follow Clements' (1991) world list.

Output: The output for this report is only sent to a [File on Disk](#).

## List of Site Names

What this report does: This report creates a list of all the [Sites](#) that are entered into the SITE table. Included in the report is the country name, Site ID Code, and the [Major and Minor Areas](#) that are associated with each site.

Output: The output for this report is only sent to a [File on Disk](#).

## Create a Species Checklist

What this report does: This report creates a Species Checklist that you can use to record your bird observations. The checklist can also be used as a data entry form, and it can serve as a backup of the information that you enter into the database.

Because the source for the output of this report is your Default Species List, you must ensure that the list which is currently the Default List is the one you want to use. You can check which list is the Default List by accessing the [User Settings on the Main Menu](#).

Options: you can also create a species check-list for any state or province. This option accesses the [North American Bird Reference Book](#) database to create the list.

Output: The output for this report may be sent to a printer or to a [File on Disk](#).

After this report has been prepared, you can finalize and customize your checklist by following these simple instructions:

1. Use your word processor to open the report's output file; optionally, delete those names from the file that you don't want on your checklist.
2. Add fonts, column formatting, and page orientation settings to suit your needs. Modify the heading as necessary to meet your requirements.
3. Print the checklist out on your printer. The codes for each species now appear to the left of the species names.
4. Make copies of the list at your local photo-duplication store.
5. Your list is now ready for use on a daily basis in the field, and it will also double as a data entry form.



## List of Species Seen in a Day

What this report does: This report generates a species list for a day which you specify when you execute the report. Included on the list will be: the species name, the number of individuals that were seen, the location where the species was found, and any remarks that may have been recorded.

To run this report, you must specify the date in M/D/YYYY format.

Options: you can display a list of species seen in a day with or without Site Name and Remarks information.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## List of Species Seen in a Major Area

What this report does: This report generates a simple list of species that have been seen in a [Major Area](#) which you specify when you execute the report.

Options: you can also display the same information (species names) for bird species that you have seen in a Major Area before or after a certain date.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## List of Species Seen in a Minor Area

What this report does: This report generates a simple list of species that have been seen in a [Minor Area](#) which you specify when you execute the report.

Options: you can also display the same information (species names) for bird species that you have seen in a Minor Area before or after a certain date.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## List of Species Seen at a Specific Site

What this report does: This report generates a simple list of species that have been seen at a specific [Site](#) which you specify when you execute the report.

Options: you can also display the same information (species names) for bird species that you have seen at a Site before or after a certain date.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## List of Species Seen in a Country

What this report does: This report generates a simple list of species that have been seen in a specific Country which you specify when you execute the report.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## List of Species Seen in a Continent

What this report does: This report generates a simple list of species that have been seen on a specific Continent which you specify when you execute the report.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## List of Species Seen During a Specific Period

What this report does: This report generates a simple list of species that have been seen during a specific period of time which you specify when you execute the report.

To run this report, you must specify the range of dates in M/D/YYYY format.

Options: you can also display the same information (species names) for bird species that you have seen during the specified time period in a specific [Major or Minor Area](#) which you specify when you execute the report.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## Species I Have Not Yet Seen

What this report does: This report generates a list of species that displays an asterisk (\*) next to each species that you have not yet seen.

Because the source for the species list is your Default Species List, you must ensure that the list which is currently the Default List is the one you want to use. You can check which list is the Default List by accessing the [User Settings on the Main Menu](#).

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).



## Number of Species Seen in One or More Years

What this report does: This report calculates and returns the number of different bird species that were seen in a year. When you execute the report, you specify the range of years to be included in the calculation. If you specify more than one year, the number of different bird species that were seen in each of the years that you requested will be displayed.

To run this report, you must specify the range of years using a 4-digit number (e.g., 1994).

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## Number of Days Birded in One or More Years

What this report does: This report calculates and returns the number of days spent birding in a given year. When you execute the report, you specify the range of years to be included in the calculation. If you specify more than one year, the number of days spent birding in each of the years that you requested will be displayed.

To run this report, you must specify the range of years using a 4-digit number (e.g., 1994).

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## Number of Bird Records in One or More Years

What this report does: This report calculates and returns the number of individual bird records (from the SIGHTING table) that were entered in a given year. When you execute the report, you specify the range of years to be included in the calculation. If you specify more than one year, the number of individual bird records that were recorded in each of the years that you requested will be displayed.

To run this report, you must specify the range of years using a 4-digit number (e.g., 1994).

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## Number of Birds Seen in Each Major Area

What this report does: This report calculates and returns the number of different bird species that have been seen in each [Major Area](#) for which you have entered records.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## Census Data for a Specific Date

What this report does: This report generates a list of the Sites that were visited for a day which you specify when you execute the report. Included on the list will be the name of the site, the weather, and the observers for each record in the CENSUS table that matches the date that you specified.

To run this report, you must specify the date in M/D/YYYY format.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## Census Data for a Range of Dates

What this report does: This report generates a list of the Sites that were visited for a range of dates which you specify when you execute the report. Included on the list will be the name of the site, the weather, and the observers for each record in the CENSUS table that matches the date range that you specified.

To run this report, you must specify the dates in M/D/YYYY format.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## List of Dates a Site Was Visited

What this report does: This report generates census-related data for a specific Site that you specify when you execute the report. Included on the list will be the name of the site, the weather, and the observers for each record in the CENSUS table that matches the parameters that you specify.

To run this report, you must select a site from the list that is provided.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

## List of Dates an Observer Was Present

What this report does: This report generates census-related data for those dates when a specific observer was present. Included on the list will be the name of the site, the weather, and the observers for each record in the CENSUS table that matches the parameters that you specify.

To run this report, you must enter a unique string of letters that appear in the name of the observer.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).



## All Records for a Specific Family

What this report does: This report lists all the observations of species that match a specific Family and range of dates. Included in the report are the date, location, number of individuals seen, and field notes for each observation.

When this report is chosen, you will need to specify the range of dates and a Family name.

Options: this report may optionally be run for all species in a Family that were observed at a specific site, in a specific Major Area, and/or in a specific Minor Area. As a result, this report provides four options for reporting all records for a specific Family.

Output: The output of this report may only be sent to the screen or to a [File on Disk](#).

## All Records for One or All Species

What this report does: This report lists all the observations of species that match a range of dates which you specify when you run the report. Included in the report are the date, location, number of individuals seen, and field notes for each observation.

When this report is chosen, you have the option of selecting a species name from a list. To report on a specific species, select its name from the species list box; to generate a report for all species, simply leave the species list box blank.

Options: You can generate this report for a single species during the range of dates specified; or for all species that were seen during the range of dates specified. In addition, for each of these two options, you can specify a specific Site, a specific Major Area, and/or a specific Minor Area for which to generate a report. As a result, this report provides eight options for reporting all records for one or more species.

Output: The output of this report may only be sent to the screen or to a [File on Disk](#).

## Query Remarks Field in Observation Form

What this report does: This report generates a list of all bird sightings for which certain remarks were recorded. You specify the kind of remarks to search for when you run the report. All records matching the specific period of time and containing the word(s) that you specify for the Remarks field of the SIGHTING table will be retrieved. Included in the report are the date, location, number of individuals seen, and field notes for each observation.

To run this report, you must specify the time period using dates that are entered in M/D/YYYY format. You must also specify the specific "Remarks" text (e.g., "song" or "nest") that you want the database to search for.

Options: You can generate this report for a single species during the time period specified; or for all species that were seen during the time period specified.

Output: The output for this report may only be sent to the screen or to a [File on Disk](#).

## All Records for a Specific Month

What this report does: This report generates a list of all bird sightings that were made during a specific month which is specified by you when you execute the report. Included in the report are the date, location, number of individuals seen, and field notes for each observation.

To run this report, you must specify the time period using dates that are entered in YYYY format; then select one of the 12 months from the list box.

Options: You can generate this report for a single species during the month specified; or for all species that were seen during the month specified. In addition, for each of these two options, you can specify a specific Site, a specific Major Area, and/or a specific Minor Area for which to generate a report. As a result, this report provides eight options for reporting all records for a specific month.

Output: The output for this report may only be sent to the screen or to a [File on Disk](#).

## Early and Late Migration Dates for a Species

What this report does: This report generates the earliest spring date and the latest fall date for a migratory species which is specified by you when you execute the report.

To run this report, you may need to specify the time period for LANIUS Excalibur to consider, using dates that are entered in YYYY format.

Options: You can generate this report for the early and late dates in each of one or more years; or for the earliest and latest dates ever recorded for the chosen species. In addition, for each of these two options, you can specify a specific Site, a specific Major Area, and/or a specific Minor Area for which to generate a report. As a result, this report provides eight options for reporting early and late migration dates for a species.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

**Note: currently, this report only supports spring and fall dates relative to North Temperate Zone localities; for example, the seasons in the South Temperate Zone are reversed and the output generated by this report would not be consistent with the seasons in that part of the Earth.**

## Documentation for a Rare Bird Sighting

What this report does: This report generates a Rare Bird Documentation Form for a documented database record that you choose when you execute the report. This report may be run from either the REPORTS menu or from the [Documentation Form](#).

Please note that while this form can be used to record practically all that is needed in order to document a rare bird sighting, some Rare Bird Records Committees encourage you to submit a separate narrative or materials (e.g., photographs or sound recordings) if there is additional information about the rare bird you found which can not be recorded within the format of LANIUS Excalibur's Rare Bird Documentation Form.

Output: The output for this report may be sent only to a printer or to a [File on Disk](#).

## Special Functions

LANIUS Excalibur uses a number of special functions to enhance the power of the database. Some of the more important functions are described below.

[ABANDON EDITS](#)

[FINDING A RECORD](#)

[DATA CONTROL BAR](#)

[DATA VALIDATION](#)

[LINKING SITES](#)

[TIME](#)

[EXITING A FORM](#)

[SPECIES SPLIT FUNCTION](#)

[SPECIES MERGE FUNCTION](#)

[TOGGLE LIFELIST FUNCTION](#)

[CREATING SPECIES LISTS](#)

[USING THE GEOGRAPHIC MANAGEMENT SYSTEM](#)

[IMPORTING A SPECIES LIST](#)

[DISPLAYING YOUR LIFE LIST TOTAL ON THE MAIN MENU](#)

## Abandon Edits

To undo the changes you may have made to a record in any of the data entry forms in LANIUS Excalibur, simply press [SHIFT-F2] (hold the [SHIFT] key down and press the [F2] function key). Pressing [SHIFT-F2] will undo any current changes to an existing record and restore it to its original condition since it was last saved. If you are in the process of entering a new record, pressing [SHIFT-F2] will abandon that process and display the most recently accessed record, if one exists. In essence, then, pressing [SHIFT-F2] abandons any edits you have made on the screen. This function is available from the **RECORDS** menu on all data entry forms.



## Data Validation

The LANIUS Excalibur database performs a variety of powerful data validation tasks each time you modify, delete, or add new records in the database. Some of the more frequent validation features are listed here.

In the [Census Form](#), you must enter valid values for Site Name and Date. Entering an improper date string (e.g., 1//9/1994) will generate an error message. Also, please note that LANIUS Excalibur is **Year 2000-compliant**; as a result, all dates entered by you **must be in M/D/YYYY format**. Date values entered with leading zeros or with 2-digit years (e.g., 05/21/95) will not be accepted.

In the [Observation Form](#), only valid species and Minor Area codes (i.e., codes for species or [Minor Areas](#) that have already been entered into the SPECIES or MINOR AREA tables) may be entered.

In the Reference Forms, each country must be assigned to a continent; each Major Area must be assigned to a country; each Minor Area must be assigned to a Major Area; and each Site must be assigned to one or more Minor Areas. Likewise, each species must be assigned to a specific family.

Finally, you will notice that when using the Reference Forms, deletion of any reference data record from the database will not be allowed when records related to it exist in other tables; this constraint helps maintain the referential integrity of the database.

## Linking Sites

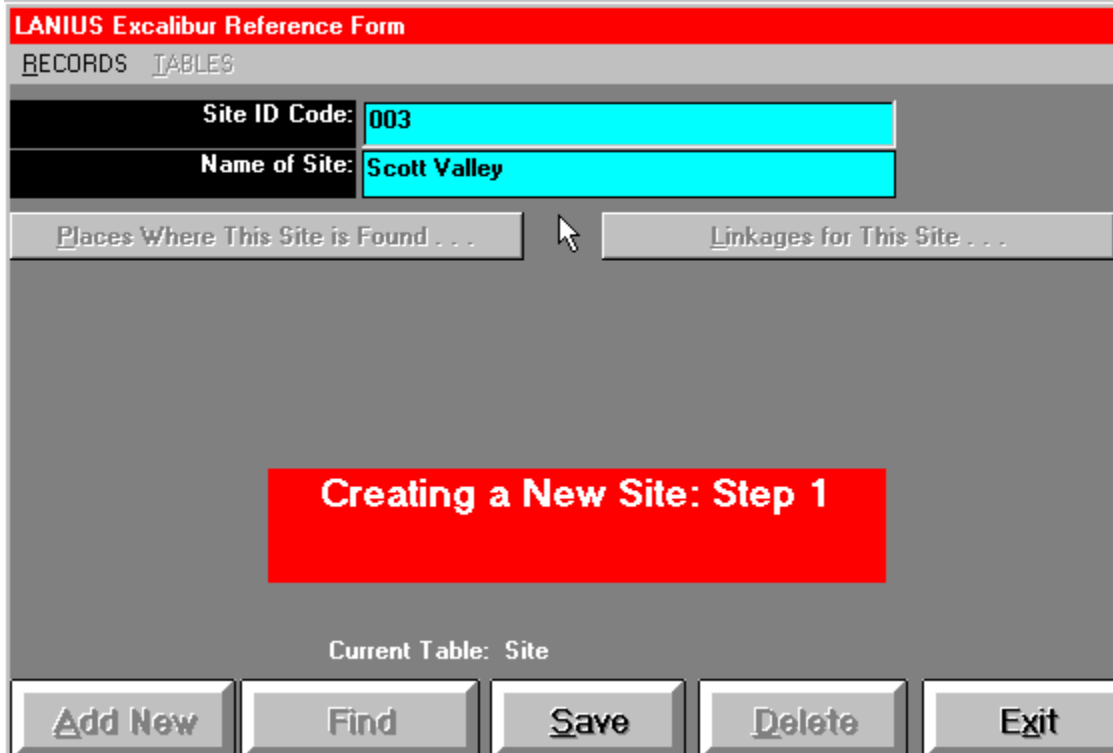
The concepts of linking a specific site to one or more existing sites is described here.

1. **Why should I link sites to one another?** Sites are nothing more than arbitrary geographic locations that have been defined by humans. If the locations of all sites were unique, there would not be a need to link them to one another. Unfortunately, some sites may overlap other sites. When the location of one site occurs within the geographic boundary of a second site, you can link the first site to the second. Linking sites to one another gives you added flexibility in defining sites and creating reports of species observed at those sites.
2. **After I link one site to another, what happens?** After you have defined a link, you can rest assured that any queries made for a specific site will include all observations of birds that have been observed at that site as well as at those sites which have been linked to it. For example, consider the city of Ames, Iowa. Let's define that as site **IA007**. Within Ames, there are a number of sites at which birds may be observed: Iowa State University Campus (site **IA008**), Brookside Park (site **IA009**), and Lake Laverne (site **IA010**), to name just a few. Let's say that we create records for each of these sites and link them to the City of Ames. Now, when we generate a report for the City of Ames, we get a listing of all species records that have been assigned to that city as well as to the ISU campus, Brookside Park, and Lake Laverne. A query based on Lake Laverne would only retrieve those species whose records have been assigned to that specific site. Finally, note that Lake Laverne is located on the ISU Campus. In addition to linking Lake Laverne to the City of Ames, we could also link it to the ISU Campus site. Doing this makes a query of site **IA008** return all observation records for the ISU campus as well as for Lake Laverne.
3. **Are Links permanent?** Links can be added and dropped at any time. To do this, find the name of an existing site in the Reference Form; then click on **Linkages for This Site ....** If any links have been defined for this site, they may be deleted using the intuitive command buttons on the screen. Press the [Escape] Key at any time to abort the action of deleting a link.
4. **How do I add a Link?** For existing sites, simply find the name of an existing site in the Reference Form; then click on **Linkages for This Site ....** The current site may be linked to other, existing sites using the intuitive command buttons on the screen. Press the [Escape] Key at any time to abort the action of adding a link.

For new sites, you will want to follow the 3-step process of [Entering a Site Name](#).

## Entering Site Names -- Step 1

To begin entering a new record for a site, access the Reference Form and select **Site Names** from the **TABLES** drop down menu. If necessary, press the **Add New** button to begin entering a new site. The following screen will appear:



The screenshot displays the 'LANIUS Excalibur Reference Form' interface. At the top, there is a red header bar with the text 'LANIUS Excalibur Reference Form'. Below this, a grey bar contains the options 'RECORDS' and 'TABLES'. The main form area has two input fields: 'Site ID Code:' with the value '003' and 'Name of Site:' with the value 'Scott Valley'. Below these fields are two buttons: 'Places Where This Site is Found . . .' and 'Linkages for This Site . . .'. A large red box in the center of the form contains the text 'Creating a New Site: Step 1'. At the bottom of the form, there is a label 'Current Table: Site' and five buttons: 'Add New', 'Find', 'Save', 'Delete', and 'Exit'.

Fill in the data for each field. Press [F3] to save the record. You will be taken to [Step 2](#).

## Entering Site Names -- Step 2

The second step of the process for entering new sites provides you the opportunity to identify what Major and Minor Area(s) the site is located in. For large sites, it is possible that two or more Minor Area records may be entered here.

The screenshot shows a software window titled "LANIUS Excilibur Reference Form" with a "RECORDS" menu. The main area is titled "Creating a New Site: Step 2". It contains the following fields:

Site Code:	003	Scott Valley
Major Area:	California	
Minor Area:	Siskiyou	

At the bottom of the window are four buttons: "Add New", "Save", "Delete", and "Exit".

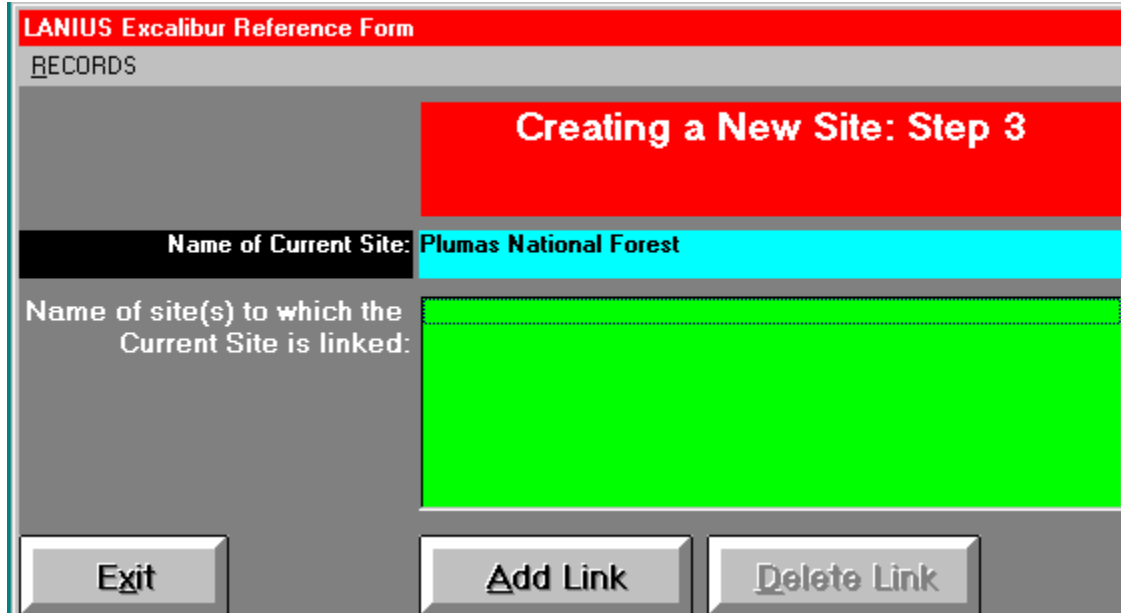
To enter the name of a Minor Area, simply select a Major Area to narrow the scope of your search; then click the Minor Area list box and select the Minor Area you are interested in. Press [F3] to save the record. You will be prompted to enter additional Minor Area records. If you answer yes, the screen will be cleared in preparation for the entry of an additional record; if you answer no, LANIUS Excilibur will then ask you if you would like to link the new site to one or more existing sites. If you answer yes here, you will be taken to [Step 3](#).

Note: if you can't find the Major Area that you are looking for in the Major Area list box, click on **Refresh List of Major Areas**, which is available on the **RECORDS** menu of this form.

**Why should I specify Minor Areas for my Sites?** By indicating what Minor Area(s) your site is located in, you can enhance the integrity of your database. When observations are added to the SIGHTING table, LANIUS Excilibur checks to ensure that each observation record is being assigned to a Minor Area which is valid for the site at which the observation record was made. The database does not allow observations to be entered if the Minor Area of the observation does not match the records recorded in the SITE LOCATION table.

## Entering Site Names -- Step 3

The third step in the process of entering a new site provides you with the opportunity to link the new site to other, preexistent sites. To Add a link, simply press the **Add Link** button and follow the instructions on the screen.



The screenshot displays a software window titled "LANIUS Excalibur Reference Form" with a "RECORDS" tab. A red banner at the top right reads "Creating a New Site: Step 3". Below this, the "Name of Current Site:" field contains "Plumas National Forest". The "Name of site(s) to which the Current Site is linked:" field is currently empty and highlighted in green. At the bottom, there are three buttons: "Exit", "Add Link", and "Delete Link".

LANIUS Excalibur Reference Form		
RECORDS		
Creating a New Site: Step 3		
Name of Current Site:	Plumas National Forest	
Name of site(s) to which the Current Site is linked:		
Exit	Add Link	Delete Link

## Time

The current time, according to your computer's internal clock, is shown whenever the [Main Menu](#) is showing.

## Exiting a Form

To exit a form, simply press the **Exit** button on the Form. You will automatically be returned to the [Main Menu](#) or the form that you accessed prior to displaying the form that you are currently in.

## Utilities

You can use LANIUS Excalibur utilities to compact, repair, or backup the database. Of these three utilities, only the Repair Database option is available for the [North American Bird Reference Book](#) database file.

[COMPACT THE DATABASE](#)

[REPAIR THE DATABASE](#)

[BACKUP THE DATABASE](#)



## Compact Database

The Compact Database utility is available from the **FILE** menu on the [Main Menu](#) form.

Over a long period of time, you may find that you have occasionally deleted, added, and modified a significant amount of data. Space that was allocated to data that have been deleted is not automatically recovered when you delete a record or even when you close the database and exit the application. Other changes to the data can, over a long period of time, incrementally contribute to the fragmentation of the database file. To recover unused disk space and defragment the database file, you may want to compact the database at infrequent intervals.

Note that you must have a sufficient amount of free space on your hard disk (at least equivalent to the current size of the XKALIBUR.DTB file) to use the Compact Database utility.

After you run the Compact Database utility, the original database file will be stored in your LANIUS Excalibur program directory as XKALIBUR.BAK. **DO NOT DELETE THIS FILE UNTIL YOU ARE SURE THAT THE COMPACTED DATABASE IS WORKING PROPERLY.** If the compacted database is not working properly, exit the application and perform the following:

1. Rename the new XKALIBUR.DTB (the compacted database file) to XKALIBUR.BAD.
2. Rename the XKALIBUR.BAK file (your original, uncompactd file) to XKALIBUR.DTB. This will return your system to the state it was in before you ran Compact Database.
3. Contact customer support to explain the problem with the XKALIBUR.BAD file.

## Backing up the Database

The Backup Database utility is available from the **FILE** menu on the [Main Menu](#) form.

The development of a database and the entry of records into the database can represent significant investments of time, money, and energy, especially if many records are involved. **For this reason, regular backups of the database should be made to ensure that the database can be restored in the event the original file(s) become damaged or corrupted.**

The LANIUS Excalibur database and all of its data are stored in a single file, called "XKALIBUR.DTB". To make a backup copy of your LANIUS Excalibur database, select the Backup Database utility and follow the prompts on the screen. The database will be backed up to a file called XKALIBUR.BUP in the BACKUP subdirectory of the LANIUS Excalibur application.

In general, the database should be backed up at regular time intervals (about once a week). Back up the database more frequently when you are entering large numbers of records. You should also back up your database before you use the [COMPACT DATABASE](#) utility.

You may also backup the database by using a file manager from within the Windows operating system or a commercially available backup software package. This option is recommended when you want to backup your database to a different location on your hard disk or to a tape drive.

Finally, we wish to mention that the [North American Bird Reference Book](#) is stored in a separate file, called "XKREF.MDB". You should set the back-up program that came with your computer to periodically back up this file from time to time; there is no command in the Reference Book program to back up this file.

## Repair Database

The Repair Database utility (for your bird sighting database) is available from the **FILE** menu on the [Main Menu](#) form. Click on **FILE** and select the **Repair Excalibur Database ...** option; separate instructions are provided for [repairing the Reference Book](#) database file.

Damage can occur to a database if the database application is open and the computer system is not shut down normally (e.g., a power failure). **ALWAYS REMEMBER TO BACK UP THE XKALIBUR.DTB DATABASE FILE REGULARLY TO AVOID DATA LOSS THAT CAN NOT BE RECOVERED BY THE REPAIR DATABASE UTILITY.**

If your database is behaving abnormally, and you believe that it has been damaged or become corrupted, then it may be necessary to run Repair Database. Note that if you have a recent backup of your database file, it is usually better to replace the damaged database file with the backup file and simply reenter any new data that was recorded since the time of the last backup.

If you don't have a backup file, or if your backup file was made a long time ago, it may be better to run Repair Database to attempt to recover as much data as you possibly can.

Repair Database checks all records in the database file, validates all system tables, and validates all indexes. After Repair Database is run, any data that could not be recovered are discarded. Because this discarded disk space is not recovered by the Repair Database utility, you should run [COMPACT DATABASE](#) after you run the Repair Database utility.

## Finding a Record

To find a record in any of the data entry forms, press the **FIND** button. A small box will appear and prompt you for the name or ID Code of the record you wish to locate. Enter the name or code for the record you want to find and then press **OK**. If the record exists, it will be displayed on the screen.

For your convenience, in the North American Bird Reference Book, the small box that prompts you for a species name will remain on the screen until you successfully locate the species you are searching for or until you explicitly Cancel the search. See the [Tutorial's](#) written documentation for more information.

When displaying Major or Minor Area names in the Reference Form, you can search for the next record that matches the last record you found by pressing the **FIND NEXT** button (e.g., there may be many counties in North America with the name of "Johnson"); to start a new search using different parameters, click on **Find Record ...** in the **RECORDS** menu of the Reference Form.

Records can also be located using the [data control bar](#).

## LANIUS Excalibur's BIRD INFORMATION CENTER

Welcome to LANIUS Excalibur's Bird Information Center! Did you know that bird watching has become one of the fastest growing outdoor recreation activities? According to the latest National Survey on Recreation and the Environment conducted by the federal government, the number of people participating in bird watching activities increased by 155% between 1983 and 1995! No wonder, then, that more and more people are taking notice of the birds in our world.

Admittedly, a tremendous amount of data on birds currently exists. One question that you may ask is, *How do I tap into that body of knowledge?* While LANIUS Excalibur can not provide an answer to every question you may have, this **Bird Information Center** will hopefully be the starting point for many excursions you take in cyberspace and in the real world.

On the links listed below, you will find pertinent discussion about birds within the context of today's world. This information, which ranges from a discussion of the basic needs of a bird watcher to the major biodiversity issues involving birds today, may be useful to you in any number of ways. We encourage you to peruse this part of the help file at your leisure. Below is a brief list of topics that will help guide you along your journey.

[The Partners in Flight Program](#)

[What Do I Need to Become a Bird Watcher?](#)

[How Do I Study Birds?](#)

[The Ecology of Birds in Today's World](#)

[What Makes a Bird a Bird?](#)

[Flight in Birds](#)

[Migration in Birds](#)

[Bird Reproduction](#)

[Identifying Birds](#)

## The Partners in Flight Program - Compañeros en Vuelo

The **Partners in Flight** (PIF) program began in 1990, primarily in response to growing concerns about bird population declines and in order to emphasize the conservation of birds not covered by existing conservation initiatives. Initially, the focus was on neotropical migratory birds (i.e., species that breed in North America and winter in Central and South America), but recently the focus has spread to include most land birds.

In order to achieve success in conserving bird populations that span both continents, the resources of public and private organizations in Latin and North America must be combined, coordinated, and increased: this is one of the key concepts behind the Partners in Flight program. Indeed, this concept has led to the formation of partnerships among federal, state, and local government agencies, professional organizations and philanthropic foundations, conservation groups, numerous universities, the forest industry, the academic community, and other groups and individuals.

These partners, working together, seek to achieve the goal of the Partners in Flight program, which is to improve the quantity and quality of monitoring, research, management, and education programs involving birds and their habitats.

Structurally, PIF consists of three committees (representing federal agencies, state agencies, and non-government organizations) that oversee the activities of working groups that were created to address the more technical aspects of the program. The coordinators of these working groups work with the national and regional PIF coordinators as part of an overall PIF Management Steering Committee which meets twice a year to promote the activities and programs of PIF.

PIF is a rather informal cooperative effort, and anyone interested in participating in local, regional, or national activities is encouraged to contact the appropriate working group or coordinator for more information. One of the best opportunities for you to participate in PIF activities is offered by PIF's annual hallmark event: International Migratory Bird Day (IMBD). IMBD occurs on the second Saturday of every May and provides an opportunity for PIF partners to raise awareness about bird conservation. IMBD also provides a forum for fund raising activities, the proceeds of which can be used for important bird conservation projects. To learn more about these and many other activities, contact: IMBD, U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, Arlington, VA 22203, visit the IMBD home page at <http://www.americanbirding.org/imbdgen.htm>, or visit the National Fish and Wildlife Foundation Home Page (<http://www.nfwf.org>).

A discussion of the PIF program is not complete without mention of the Flight Plan. The Flight Plan recognizes that an abundance of wild birds contributes to ecosystem health and provides economic, recreational, scientific, and aesthetic values for society. Fostering cooperative, voluntary, and coordinated habitat management on private and public lands that will lead to the conservation of avian diversity throughout the Western Hemisphere is the focus of the Partners in Flight Bird Conservation Strategy, or simply, **The Flight Plan**.

The Flight Plan summarizes the collective actions that are being taken and that are necessary for the conservation of birds. The Strategy provides the framework for Bird Conservation Plans that set conservation priorities and specific objectives for bird populations and habitat for every state and ecoregion in the United States. Furthermore, the Strategy lays out the means by which these Plans can be implemented. This process involves an unprecedented level of voluntary cooperation and coordination among state and federal agencies, private organizations, industry, and the public.

Partners in Flight and the Bird Conservation Strategy are common sense approaches to the

conservation of birds and their habitats. The Flight Plan lays the groundwork for international cooperation on long-term conservation of all birds throughout this hemisphere.

To learn more about the Partners in Flight program, please check out this Internet address:  
**<http://www.partnersinflight.org/>**.

## What Do I Need to Become a Bird Watcher?

In a nutshell, the answer would be: **Hardware, software, technical references, and a network of friends.** This, of course, assumes that you *already* have an innate interest in birds. A brief discussion of these four needs is provided below.

[Hardware](#)

[Software](#)

[Technical References](#)

[A Network of Friends](#)



## Hardware

Any beginning bird watcher will want to have, at a very minimum, a good pair of binoculars. In fact, most bird watchers start out with no more than this. When deciding on what type of binoculars to buy, you will want to consider the magnification or power of the binoculars, the size of the objective lens, lens coating, overall weight and size, and close-focus ability.

If you see a pair of binoculars advertised as 8 x 40, that means it has a magnification of 8 (i.e., the object being observed appears 1/8 as far away) and the size (in millimeters) of the objective (large) lens is 40 millimeters across. In general, 7x (or 7-power) binoculars emphasize brightness and a wider field-of-view whereas 10x binoculars emphasize a larger image at the expense of a narrow field-of-view and less brightness. Magnification and objective lens size affect the size of the exit pupil, which is a statistic calculated by dividing the objective lens size by the magnification. All other things being equal, a larger exit pupil appears brighter and is more desirable; an exit pupil of about 4 mm is recommended.

Lenses that are coated have an increased capacity to transmit light. As a result, image resolution is improved, glare is reduced, and the problems due to reflections are less frequently encountered. While it is not always possible to tell if your binocular lenses are coated, it is generally recommended that you purchase binoculars from a manufacturer and/or dealer who has a well-established track record with the birding community.

Weight and size of binoculars are important considerations, as well. In general, heavier binoculars are more easily handled by men than women. The ability to hold binoculars steady decreases with increasing size and weight of the instrument.

If you are a land birder, and especially if you are a woodland birder, the ability to focus in on a bird that is only a few feet (e.g., 6-10 ft.) away may be extremely important to you. Some binoculars perform better in this regard than others.

Finally, you will notice that there are two basic types of binoculars: roof prism and porro prism binoculars. Both perform well in the field, although roof prisms are more expensive. On the other hand, porro prisms are more likely to develop alignment problems if they are dropped.

The acquisition of a good pair of binoculars will allow you to observe and study birds in most places and under most conditions. However, if you find yourself devoting more and more time to this wonderful pastime, the next logical step to take involves the purchase of a tripod, spotting scope, and a 35-mm camera. While a detailed assessment of the options to consider when purchasing these other items is beyond the scope of this discussion, it is nonetheless worthwhile to note that consideration should be given to a camera that can interface with your spotting scope, thereby allowing you to take pictures *through* your spotting scope. You will also want to consider whether you want to use a 45-degree angled eyepiece on your scope or a straight eyepiece. Finally, it is important to purchase a tripod that is sturdy enough to withstand the wind without excess vibration and which extends (fully upright) to a height that eliminates the need for you to have to stoop over whenever you want to use it.

## Technical References

At one time, you basically had just two choices when it came to field guides: *Birds of North America*, by Chandler S. Robbins, et al.; and *A Field Guide to the Birds*, by Roger Tory Peterson. In 1983, The National Audubon Society released its three-volume set entitled, *The Audubon Society Master Guide to Birding*. In that same year, the National Geographic Society countered with the *Field Guide to the Birds of North America*. Since that time, there have been additional offerings, too numerous to mention here. Suffice it to say that you now have many good options when it comes to deciding what kind of field guide you want to use.

In general, it is recommended that beginning bird watchers start out with a field guide that minimizes complexity and emphasizes ease-of-use. As you become more experienced in bird identification, consider upgrading to a field guide that offers more, in-depth discussion on the variation (in plumage, size, vocalizations, color, etc.) that a species exhibits across its range. In fact, you will notice that there are a lot of "specialty guides"--field guides that focus exclusively on a specific family or group of birds--on the market these days; these specialty guides may be of value to you if you have developed a keen interest in certain kinds of birds.

While field guides that offer photographic illustrations of birds are at first appealing, be sure to contrast these with those field guides that use artists' illustrations. In general, an artist's illustration of a species is more likely to capture all of the key field marks than a single photograph can.

In addition to field guides, the classic *The Audubon Society Encyclopedia of North American Birds* (by John K. Terres, 1980) and the similar (but more recent) *Birder's Handbook* (by Paul R. Ehrlich, David S. Dobkin, and Darryl Wheye, 1988) provide an encyclopedic collection of bird related information and data that are often useful to ornithologists who are involved in research or otherwise want to learn more about the birds that they have seen.

## Software

Prior to the 1980's, the use of computer software to manage one's personal bird data was virtually unheard of. However, in today's world, it is a very common event. In fact, we at LANIUS Software believe that the opportunities for computer-related applications that focus on birds are virtually limitless.

Bird related software falls into one of three very broad categories:

- 1) Software to manage one's personal bird sightings and related information, including his/her life list;
- 2) Software that provides an encyclopedic collection of data and information about birds, including their distribution, abundance, and ecology; and
- 3) Software that is used by natural resource professionals and which performs one or more scientific/statistical functions on bird related data.

These divisions are not mutually exclusive, and you may occasionally see software that is a blend of two or all three of these categories.

Several CD-ROMs are now available that perform the function of the second category identified above. These CD-ROMs can be purchased in stores that focus on wild bird related products and or nature in general. One of the disadvantages of these CD-ROM programs is that they have a very limited capability to allow a bird lister to record all of his/her bird sightings, or they require you to purchase a separate program to meet that need.

The [North American Bird Reference Book](#) is an excellent example of software that provides, in one application, many of the features found in the first two categories described above; indeed, the features and reporting options found in the LANIUS Excalibur bird sighting database are among the best available today to be included in a bird CD-ROM program.

In addition to bird related software, you will also want software that allows you to connect to the Internet. Going on line to learn about birds is becoming more and more common each year. You can now download species checklists, photographs, sound files, range maps, survey results, and a multitude of other data on birds from the Internet. Moreover, there are a number of mailing lists that you can join. Once you become a member of a mailing list, you can send and receive messages about birds that occur in your area. This is also an excellent way to learn about rare birds that have been found at locations near you.

Many of the Rare Bird Alerts that at one time were accessible only by phone now provide their content on the Internet in a timely fashion.

## A Network of Friends

When you get right down to it, birding is a social event. Just think, how much fun is it to find a Yellow Rail if you can't share that experience with someone?

Having a network of friends not only provides you with a companion or partner when you go birding, but it also increases the chances that you will be notified when someone finds a rare bird in your area.

There is hardly no greater feeling than the moment when you receive that exciting phone call at 10:30 at night, from a friend who has just heard about the observation of the first state record for Northern Hawk Owl. Aside from not being able to sleep that night, you will without a doubt treasure your network of friends when you observe your first live specimen of *Surnia ulula* at 6:30 a.m. the next morning!

## How Do I Study Birds?

One may ask the question, "How long must we study the birds before we can see the 'big picture,' the grand design of the world's ornithological arena?" This question is difficult to answer, but only because of its limitless implications. Since bird populations are always in a state of flux, it is certain we will never reach a total understanding of the world's avifauna. This is not to say, however, that the study of birds is a fruitless effort. Indeed, the study of birds must continue, and at an ever-increasing rate. Without the work that has gone before and the work that still needs to be done, effective management of threatened and endangered species will not be possible, and the ability to detect population declines before they reach detrimentally low threshold levels will be lost.

The study of birds can be accomplished by many different methods. A brief summary of some of those methods is provided below. Space limitations prevent us from providing an all-inclusive list of bird study techniques; however, the topics presented below are certainly representative of what can be accomplished by professional and amateur ornithologists such as yourself.

[The North American Breeding Bird Survey](#)  
[National Audubon Society Christmas Bird Counts](#)  
[Monitoring Avian Productivity and Survivorship Program](#)  
[Other Monitoring Programs](#)  
[Make Your Own Contribution to Science](#)

## The North American Breeding Bird Survey

Established during the 1960's, Breeding Bird Surveys (BBS) are conducted during the height of the nesting season. Each route is 24.5 miles long and contains 50 census stops located at 0.5 mile intervals. At each of these census stops, a three-minute point count of birds is made: all birds heard or seen by the observer within 0.25 miles of the stop are recorded. Approximately 3700 active BBS routes are located across the continental United States and Canada.

The BBS was designed to provide an index to changes in bird populations across the North American continent. Bird sightings are recorded at each stop, and then totaled over the entire 50 stop route. These data are then transmitted to the BBS office at the Patuxent Wildlife Research Center, in Laurel, Maryland, where it is computerized and analyzed.

Contact your local Audubon Society for more information about the BBS's in your area and how you can help participate in one.

## National Audubon Society Christmas Bird Counts

Christmas Bird Counts (CBC) are conducted in the United States and Canada over a three-week period during the latter half of December and the beginning of January. The counts have been conducted annually since 1900, when they were established as an alternative to the custom of some sportsmen in the late 1800s of shooting as many birds of any species as they could in one day during the Christmas season. The CBC has become the oldest continuous wildlife survey in North America. The results of these counts are published annually by the National Audubon Society, the organization which oversees the collection and tabulation of all Christmas Bird Count data.

Each CBC occurs within a 15-mile diameter circle. Each CBC is conducted during a single calendar day, the exact date being determined by the count coordinator or compiler. CBC data are used to analyze winter bird distribution patterns and winter bird population trends.

LANIUS Software now offers a computer program that you can use to record the different birds that have been seen on one or more of your favorite Christmas Bird Counts. EZCBC™ 3.0 is an excellent companion product to the [North American Bird Reference Book](#). Contact LANIUS Software for more information about how you can purchase **EZCBC 3.0, the Ultimate Christmas Bird Count Database!**

Contact your local Audubon Society chapter to learn more about CBC's in your area and how you can participate on one.

## Monitoring Avian Productivity and Survivorship (MAPS) Program

The MAPS program is a cooperative effort among public agencies, private organizations, and the bird banders of North America. Its purpose is to provide long-term data on the productivity, survivorship, and population sizes of certain land bird species by using such techniques as constant-effort mist netting, bird banding, and point counts during the breeding season. Much of the demographic information that is collected as part of this program is used in efforts to conserve avian diversity throughout North America.

Any public agency, private organization or independent bird bander currently utilizing or able to establish one or more banding stations operated regularly throughout the breeding season is encouraged to participate in the MAPS program. All that is required is the standardized operation of a series of about ten nets at permanent sites on only one day during each of about ten consecutive ten-day periods between about mid-May and late August. Continuation of the study for at least five consecutive years at each station is recommended in order to provide reliable estimates of annual variations in productivity and survivorship.

For more information on MAPS stations, contact Kenneth Burton at The Institute for Bird Populations, P.O. Box 1346, Point Reyes Station, CA 94956-1346 (fax 415-663-9482).



## Other Monitoring Programs

The CBC, the BBS, and the other programs mentioned above are examples of large-scale monitoring programs. The objectives of monitoring programs determine the type of technique you will use to study birds. For some programs, it may only be necessary to determine if a species is present or absent. However, for other programs, knowledge about the reproductive dynamics and rate of population growth for a species is critical to achieving the monitoring objectives.

Once the objectives have been established, the methods that will be used to enumerate the birds can be chosen. Mapping, transects, or point counts are the methods most often used. Other methods that may be chosen, however, include capture-recapture studies, aerial counts, and migration counts (Verner, Jared. 1985. Counting Techniques, *in*: Current Ornithology, Volume 2 (Richard F. Johnston, editor), Plenum Press, New York, pp. 247-302).

In addition to the BBS and the other programs identified above, there are a number of other monitoring and bird study programs that you can become involved in. In general, the purpose of most monitoring programs is to track changes in bird populations over time. Such trends serve as a barometer of the environment's health, and allow wildlife managers to take a pro-active approach to bird conservation and management. Some of the programs that may be of interest to you are:

1. The Breeding Bird Census--long term studies of individual census plots that provide information on the changes that occur in the breeding birds that are part of the surrounding community. Contact the Cornell Laboratory of Ornithology (159 Sapsucker Woods Road, Ithaca, New York, 14850) for more information.
2. The International Shorebird Survey (ISS)--This program consists of volunteer cooperators who collect data and contribute to the development of conservation programs that serve to protect the migration networks for shorebirds throughout the Western Hemisphere. Many of the shorebirds that breed in the arctic are dependent on strategic inland and coastal wetland locations in both North and South America. These wetlands provide opportunities for the birds to acquire fat that is used as fuel during the remainder of their migration, the total length of which may exceed thousands of miles. For more information on this survey, contact the ISS, c/o Manomet Observatory, PO Box 1770, Manomet, Massachusetts, U.S.A., 02345 (Telephone 508 224-6521; FAX 508 224-9220).
3. Monitoring of Hawk Migrations--Many states now support one or more hawk watching stations, which are places that you can visit to search for migrating hawks. The best times to visit these areas is the fall migration period, when spectacular numbers of hawks are sometimes found. Many of these hawk watch areas are members of the Hawk Migration Association of North America (HMANA), which was established in 1974 for the purpose of monitoring the migration and population of birds of prey throughout the North American continent. To inquire about membership in the HMANA, write to the Membership Secretary, 377 Loomis Street, Southwick, MA 01077.
4. Bird banding--bird banders place metal or plastic bands on the legs of birds. Later, when banded birds are shot by hunters, recaptured, or found dead, the number on the band can be recorded, thus allowing biologists to compare the recapture data to the age and location of the bird when it was first banded. Conservationists and ornithologists have increased their knowledge of bird population dynamics, migration routes, migration timing, and the locations of bird wintering areas as a result of bird banding efforts. Contact the U.S. Fish and Wildlife Service's Bird Banding Lab at Laurel, Maryland, for more information about this activity.
5. Breeding Bird Atlases--Breeding bird atlases are designed to document the current knowledge about breeding birds across a geographic area. The scope of an atlas

may be as small as a single county to as large as an entire state. The data that are collected represent a snapshot in time of what we know about the birds in a certain area. Much of the census work for breeding bird atlases is conducted during the summer months and provide an opportunity to make summer birding more enjoyable than it otherwise would be. Contact your local Audubon chapter to see if there are any active atlas areas near you.

## Make Your Own Contribution to Science

Finally, let us not forget that one of the easiest ways for you to study birds is to go out and watch them. Sound too easy? Well, you can make it more exciting by taking notes on what species you find and where you find them. These field notes can be entered into a database program like **LANIUS Excalibur**, thereby providing you with the opportunity to produce reports of your sightings that can be shared with other individuals, organizations, and journals. Some state and national bird watching journals publish the more significant observations of amateur and professional ornithologists such as yourself. As a result, you should consider making your contribution to science and the study of birds by sending in a report of your seasonal data to the appropriate regional compiler of bird sightings. *Field Notes* (formerly known as *American Birds*) is an example of a national journal that is devoted to reporting and documenting the observations of bird watchers.

## The Ecology of Birds in Today's World

Globally speaking, birds are part of the Earth's ecosystem. In fact, all life on the Earth can be thought of as part of one large, independent system. This is the concept behind the term biodiversity. When we speak of biodiversity, we speak of a system where life interacts with, and in many ways depends on, the nonliving components (e.g., soil and water) of the Earth. Global biological diversity, then, represents the sum total of genetic diversity, species diversity, and ecosystems on the Earth.

Birds represent one very visible component of the Earth's biodiversity. As a biological resource, birds occur on every continent and can even be found many miles away from land on the open seas. However, through our studies of biodiversity, we have come to realize that birds, just like any other resource, have ecological limits which can not be exceeded lest we risk the extinction of one or more species.

On a more local level, the area where birds interact with the other organisms around them is called a community. Within the environment of the community, a number of physical and chemical processes can be identified (e.g., the cycle of water from the sky, to the earth, into the plants, and evaporating back to the atmosphere again). These processes, the physical environment in which they occur, and the community itself form a local ecosystem. Understanding the concepts of an ecosystem and how they interact with one another is one of the key tenets of ecosystem management. When we fail to acknowledge or understand these concepts, we place the resources in these communities at risk. Consider the following two examples:

Forest fragmentation in eastern North America has been found to have a negative effect on those land birds that depend on large blocks of continuous forest habitat. Alterations in the landscape that introduce small openings into previously forested habitat subject these species to cowbird parasitism, disturbance, and microclimate variations that cumulatively affect the ability of the species to successfully reproduce over time.

In western North America, habitat alterations resulting from clear-cut harvests across the landscape decreased the amount and distribution of habitat needed by the Spotted Owl. Over time, the effects of such harvest practices raised concerns over the ability of the Spotted Owl to cope with population isolation, habitat loss and modification, and related edge effects; all of this eventually led to the listing of the Northern Spotted Owl subspecies as a threatened species under the Endangered Species Act.

The Endangered Species Act is one mechanism that is used to preserve biological diversity. Once a species is listed as endangered, which means it is in danger of becoming extinct, a recovery plan is usually prepared, the ultimate objective of which is to identify measures that can be taken to increase the abundance and distribution of the species to a point where its viability is no longer threatened and it can be removed from the list of endangered species.

Sometimes, by [studying birds](#), we can identify negative population or habitat trends in a species at an early stage, allowing us to develop conservation strategies that can be implemented to ensure that the species never becomes listed as threatened or endangered.

The great majority of the Earth's biodiversity occurs in the tropics, where species of birds that are new to science are still being identified each year. Yet, we must recognize that humans are placing an ever increasingly greater demand on all of the Earth's resources. Our current rate of resource consumption is threatening to overtake the world's capacity to

produce and maintain those resources. It is for this reason that biological diversity must be conserved. The phrase "Think globally, act locally" is a battle cry for many of those who are currently implementing resource conservation within an ecosystem management framework. Single species management initiatives, although once common, are being replaced by more holistic, ecosystem-based approaches to managing the landscape. Although it takes time to gain a complete understanding of the ecosystems for which we serve as land stewards, it can safely be said that the future of bird conservation lies in utilizing ecologically-based management concepts in our efforts to manage for optimal levels of biological diversity.

## Using the Geographic Management System

No matter where you are in the world, LANIUS Excalibur's **Geographic Management System** is smart enough to distinguish between states, counties, provinces, regions, etc., all within the context of the country in which you are birding! This section of the help file explains how to use the Geographic Management System for international birding.

Recall that LANIUS Excalibur divides countries up into Major and Minor Areas. Each Major Area consists of a certain type (e.g., a state in the United States or a province in Canada). Likewise, each Minor Area consists of a certain type (e.g., a county in the United States). The types of Major or Minor Areas that you work with are predefined in the MAJOR AREA TYPE and MINOR AREA TYPE tables, respectively. LANIUS Excalibur ships with the following records pre-entered into these tables:

### MAJOR AREA TYPE TABLE

ID Code	Name of Type
PR	Province
ST	State

### MINOR AREA TYPE TABLE

ID Code	Name of Type
CO	County
PA	Parish

To use this system for international birding, consider the following example. In Jamaica, there are three large counties, and within each county, there are several parishes, as shown below:

Cornwall County parishes: Hanover, Westmoreland, St. James, Trelawny, St. Elizabeth

Middlesex County parishes: St. Ann, Clarendon, Manchester, St. Catherine, St. Mary

Surrey County parishes: Portland, St. Thomas, St. Andrew

To begin entering data for birds found in Jamaica, note that a county in Jamaica is similar to a state in the United States, and that a parish in Jamaica is similar to a county in the United States. Thus, we have our Major Areas (Counties) and Minor Areas (Parishes) defined for Jamaica. Since we already have a record for "Parish" in the MINOR AREA TYPE table, we only need to add a record for "County" to the MAJOR AREA TYPE table. To begin entering records for Jamaican birds, we must first complete the steps shown below:

1. Choose **REFERENCE DATA** from the Main Menu.
2. Select **Major Area Types** from the **TABLES** menu.
3. Press the **Add New** button and, when the screen is cleared, enter "CO" in the Major Area Type Code field and "County" in the Major Area Type Name field.
4. Press **Save** to save the record.
5. Select **Major Areas** from the **TABLES** menu.
6. While the Major Area table data is showing, press **Add New** and enter a record for Cornwall County, Jamaica: type "Cornwall" in the Major Area Name field, select "Jamaica" from the Country list box, and select "County" from the Major Area Type list box.

Note: if the name of the Major Area you are adding has the same name as a previously entered record, you may want to annotate (in the Major Area Name field) the country of the Major Area in parentheses: **Middlesex (JM)**. This ensures that you will always be able to distinguish similar Major Area names from one another when you access a list of such names in the database.

7. Repeat step 6 two more times to enter records for Middlesex and Surrey Counties, Jamaica. After entering the third record, make sure that it is saved.

8. Select **Minor Areas** from the **TABLES** menu.
9. Press **Add New** and begin entering records for Hanover Parish in Cornwall County, Jamaica: type "Hanover" in the Minor Area Name field, select "Cornwall" from the Major Area list box, and select "Parish" from the Minor Area Type list box.
10. Repeat step 9 for each of the parishes in Cornwall County, Jamaica, and for each of the parishes in the other two Jamaican Counties.
11. Select **Site Names** from the **TABLES** menu; press **Add New** and create one or more sites for Jamaica, following the easy three-step process.
12. Return to the Main Menu and press **ADD/EDIT RECORDS** to begin entering records the way you normally would. Any sites that you defined for Jamaica will appear in the Site Name list box on the Census Form.

Note that from this point forward LANIUS Excalibur will always treat Major Areas as counties and Minor Areas as parishes for the country of Jamaica; yet, LANIUS Excalibur is smart enough to know that Major Areas in the United States are states and Minor Areas are counties. This is one of the most exciting benefits of using the LANIUS Excalibur program.

Finally, note that while it will almost always be easy to define Major Areas for a country, it may not always be easy to identify Minor Areas within each of the Major Areas. When this is the case, we suggest (if you have not already done so) that you add a record to the MINOR AREA TYPE table called "Region" (using "RE" as an ID code for this record); see the Tutorial for more information on how to do this. You can then divide the Major Area in question up into four minor areas (Southwest, Northwest, Southeast, Northeast), the records for which could be entered as "regions" into the MINOR AREA table.

## Importing a Species List

LANIUS Excalibur ships with all of the species of the world already included in the SPECIES table. Because there are over 9600 species names, LANIUS Excalibur allows you to work with **subsets** of this species list when running reports or during data entry when using the [Observation Form](#) or [Pick List Form](#). You do this by making one of these subset lists your Default List.

LANIUS Excalibur ships with two subset species lists already included in the database: your Life List and the list of North American birds. However, you have the capability of adding additional default species lists to the program at any time. The steps to do this are outlined below.

1. Access the Reference Form, and select **List Names** from the **TABLES** pull-down menu.
2. When the List Names data set is on display, select **Import a Default Species List ...** from the **RECORDS** pull-down menu.
3. The names of the species lists that you may import are presented in a list box. You have the option of importing a predefined list of species (i.e., birds for Africa, Argentina, the Southern Ocean area, Costa Rica, the United Kingdom, Australia, or Hawaii) or selecting "Other" from the list; click on your selection.
4. Press the **OK** button to import the selected list of species names (or press [ESC] to cancel the operation).
5. If you selected "Other", you will be asked to specify the file name of the list that you want to import; additionally, you will be prompted for the name and ID Code that should be assigned to this list (e.g., "Back Yard" and "BY" could be the name and ID code that you assign to a default species list for your back yard). *Note: if you are planning to import a species list that was [exported](#) from the [North American Bird Reference Book](#), click "Other" in step 3, press **OK**, and select the file called `LXEXPORT.TXT` as your import file.*

The program will import the list of species names that you selected. You will be notified if any errors are encountered.

Please note that you can create your own customized default lists (e.g., lists for the counties in your state, your back yard, or for the State Park that you visit most often). To do this, follow these simple steps:

1. Begin by first asking yourself whether the customized species list that you wish to create would be a subset of one of the default species lists that already exists.
  - a. If your answer is yes, ensure that the appropriate default list has been selected (see [Main Menu Settings](#) for more information). Then, run the BASIC report called **Create a Species Check-list** (the output of this report is sent to a file of your choice). Use your word processor to open this file and delete those names from the report that you don't want on your check-list, then print the check-list out on your printer. The codes for each species now appear to the left of the species names.
  - b. If the answer is no, you will need to generate a report of all species names in the database. To do this, run the report **List of Species Names**. The output of this report (9,600+ species names) is sent to a file of your choice. Open this file using your favorite word processor and delete the names of those species that you don't want on your check-list, then print the check-list out on your printer (use small fonts and landscape orientation to ensure that the list prints out with each species name on a separate line). The species



name and **ID Code** will be included in this output.)

2. Using a text editor (e.g., WordPad), **create a new file** and **enter the Species ID Codes from your printout, placing each code on a separate line**. For example, a list of three species (Black Tern, Least Tern, and Mourning Dove) would appear as follows:

**1638**  
**1668**  
**1843**

3. **Save the file as a text file** in the directory where LANIUS Excalibur is installed, and give it a name that makes sense to you (e.g., **BACKYARD.TXT**). Then follow the five steps outlined above for importing a species list; select "Other" from the list of available files to import and provide the name of your customized list file (e.g., BACKYARD.TXT).

## Changing the Minor Area in the Observation Form

When using the Observation Form, you will in most cases not need to know the codes for the Minor Areas to which birds are assigned. However, after a record has been saved to the database, you may want to change the Minor Area to which the bird observation has been assigned. To do this, position the cursor on the **Change Minor Area** field and enter the ID Code for the Minor Area desired. Consult the report of Major and Minor Areas you generated earlier to obtain the ID Code for any Minor Area currently in the database.

## Invoking World/Default Species List in the Observation Form

Your Default List will always be used to populate the list box in the Observation Form with species names. If you need to enter a bird sighting whose name is not on your Default List, simply access the **EDIT** menu, press **Edit User Settings ...** and click on **Invoke World List**. Follow these same steps and click on **Invoke Default List** when you want to restore your Default List to the list box.

Note: this function is only available when you identify species in the Observation Form by typing the common or Latin name.

## Invoking World/Default Species List in the Reference Form

When accessing the SPECIES table in the Reference Form, by default the world list of species names will always be on display. However, you can limit the display to just those species that are on your Default List by clicking **Invoke Default List** on the **UPDATE LIFELIST** pull-down menu. **Limiting the list of species to just those that are on your Default List can be useful when you want to quickly enter or update your life list.** For example, by making the North American list the Default List, you can enter the Reference Form, access the SPECIES table data set, and invoke the Default List. Once the Default List is on display, press [F7] or [SHIFT-F7] to advance to the next or previous record, respectively. When you find a species record that is on your life list but still shows "N" in the **On Life List?** field, simply press [F8] to toggle the value of this field to "Y".

To redisplay the world list of species names, click **Invoke World List** on the **UPDATE LIFELIST** pull-down menu.

This setting remains active only as long as you are working in the Reference Form; if you exit the form and later return to it, the world list of species names will be on display regardless of what your previous settings were.

## What is the North American Bird Reference Book?

**LANIUS Software's North American Bird Reference Book™** is a true multimedia experience. It is designed for anyone who has at least a general interest in nature, especially birds. With this program, you can learn about the basic life history of birds, including the habitat they use, where they are found, how to identify them, the nesting strategies they employ to raise their young, what they sound like, and what they look like. Intermediate and advanced birders will also find these features of the Reference Book to be useful in helping them further their study of birds.

In addition, LANIUS Software has included with the Reference Book the latest edition of **LANIUS® Excalibur, the Ornithological Database for the Natural World!**, which is designed to store data about birds that you have observed throughout the world. Its primary purpose is to maintain detailed records of birds seen and places visited by bird enthusiasts such as yourself.

LANIUS Software's North American Bird Reference Book only operates on 32-bit Windows operating systems. It uses Clements' (1991) world check-list of bird species names. This check-list provides a current listing of the nearly 9,700 species of birds recognized by modern-day ornithologists. Included in the book, for each species, is the scientific name, the best-known English name, and a description of the species' world-wide range.

## What Can You Do With the Reference Book?

When the North American Bird Reference Book first loads, it will display a set of records for Common and/or Widespread Species. Note that the red status bar (the horizontal bar below the text field) also describes the type of records (in this case, Common or Widespread Species) that are displayed in the current record set.

The first record that is on display will be that for the Pied-billed Grebe. While any species record is showing, you may have up to five different options immediately available to you:

**PRINTING THE SPECIES ACCOUNT FOR THE SPECIES**  
**DISPLAYING A PHOTOGRAPH OF THE SPECIES**  
**PLAYING THE SONG OR CALL NOTES OF THE SPECIES**  
**VIEWING THE DISTRIBUTION MAP FOR THE SPECIES**  
**FINDING THE SPECIES ACCOUNT FOR A DIFFERENT SPECIES**

To **Print** the species account for the species record currently on display, simply press the **PRINT RECORD ...** button. The output will be sent to the default printer attached to your computer. Note that the shortcut key for printing a species record is [CTRL-P].

To **Display** a photograph of the species whose species account is currently on display, simply press the **SHOW PICTURE ...** button. Please note that the **SHOW PICTURE ...** button will be disabled if there are no photographs in the database for the currently selected species. The shortcut key for viewing the image of a species is [CTRL-I].

To **Play the Song** and/or call notes of the species whose species account is currently on display, simply press the **PLAY SONG** button. Please note that the **PLAY SONG** button will be disabled if there is no song recording in the database for the currently selected species. The shortcut key for playing the song of a species is [CTRL-G]. A bird's song may also be played while looking at its photograph in the Inflight Field Viewer.

To **View the Distribution Map** of the species whose species account is currently on display, simply press the **SHOW MAP ...** button. Please note that the **SHOW MAP ...** button will be disabled if there is no range map in the database for the currently selected species. The shortcut key for viewing the distribution map of a species is [CTRL-M].

To **Find** the species account for a different species, simply press the **FIND RECORD ...** button and enter the name of the species you want to find at the prompt. Please note that if the species you want to find has a hyphen in its name (e.g., Pied-billed Grebe), then you must spell its name with the hyphen included. The shortcut key for finding a species record is [CTRL-F].

If, after pressing **FIND RECORD ...** and entering the name of the species you are interested in, you get an error message informing you that the species record could not be found, it may be that the species name was incorrectly spelled by you or that the record for a particular species is not contained within the current record set. In either event, you can switch to a different record set which may possibly have the record you are looking for. To do this, simply access the **SEARCH menu** and **select one of the five record set options that are available.**

## REFERENCE BOOK FORM

**LANIUS Software's North American Bird Reference Book**

FILE VIEW SEARCH HELP

**Loggerhead Shrike** **Lanius ludovicianus**

Family: **Laniidae** Alternate Name:

**Natural History:** **Habitat:** This species breeds on lowland plains or gently rolling hills, usually below an elevation of 2000 m, where it is found in semi-open country typified by areas with short-grass and bare soil; also usually present are thorny shrubs or low-hanging trees. These conditions are present in a variety of situations, ranging from agricultural farmlands and pastures to desert scrub, residential areas, old fields, or orchards (Lefranc 1997).

**BBS Trend**  
**-3.6 \*\*\*\***

**Distribution:** Breeding range extends from California (except northwestern corner of state) north to eastern Oregon, eastern Washington, and central Alberta; and from there east to central Saskatchewan, southern Manitoba, Minnesota, southern Ontario, southwestern Quebec, and Pennsylvania; and south to southern Baja California, Mexico, Texas, the Gulf coast, and southern Florida. Generally winters from central Washington, southern Nevada, Utah, southern Colorado, and southern Kansas east to Illinois, central Ohio, and Virginia; and south throughout its breeding range (A.O.U. 1998).

**Field Marks:** Gray, black, and white plumage features black tail edged with white, black wings

**Records for Common or Widespread Species**

**FIND RECORD ...** **PRINT RECORD ...** **SHOW MAP ...**

**PLAY SONG** **SHOW PICTURE ...** **EXIT ...**

When the North American Bird Reference Book Form is on display, you have access to over 900 species accounts for North American Birds. In addition, songs, photographs, and distribution maps are included for many of the more common bird species that are found in North America.

Specific features on the Reference Book Form include:

[PRINTING A RECORD](#)  
[FINDING A RECORD](#)  
[PLAYING A SONG](#)  
[DISPLAYING A BIRD PHOTOGRAPH](#)  
[DISPLAYING DISTRIBUTION MAPS](#)  
[LANIUS SOFTWARE SECRETS](#)  
[BBS TREND DATA](#)  
[STATUS OF A SPECIES](#)  
[QUERYING THE DATABASE](#)  
[DISPLAY MY BIRD SIGHTINGS](#)  
[TAKING A QUIZ](#)  
[REPAIRING THE DATABASE](#)  
[SYNCHRONIZING DATABASES](#)  
[EXPORT A SPECIES LIST](#)  
[ACCESS LANIUS SOFTWARE'S HOME PAGE](#)  
[INFLIGHT FIELD VIEWER](#)





## Printing a Record

To print the species account for the species record currently on display in the North American Bird Reference Book, simply press the **PRINT RECORD ...** button. The output will be sent to the default printer attached to your computer. Most species records will print in its entirety on a single page of paper. Note that the shortcut key for printing a species record is [CTRL-P].

## Finding a Record

There are a number of different ways to Find the species account for a different species, and they are described in the following paragraphs. You may find that one option is more appropriate than others, depending on the species account you are looking for.

1. **Accessing the next available record or the previous available record.** Only one species account at a time is displayed on the screen. The accounts are displayed in taxonomic order, by family. To display the next available record, press the **Next** button or the [F7] key. To display the previous available record, press the **Prev** button or [SHIFT-F7].
2. **Finding a specific record in the current set of records.** The red status bar (the horizontal bar below the text field) describes the type of records that are displayed in the current record set. To find a specific species account in this record set, simply press the **FIND RECORD ...** button and enter the name of the species you want to find at the prompt. Please note that if the species you want to find has a hyphen or an apostrophe in its name (e.g., Chuck-will's-widow), then you must spell its name with the hyphen or apostrophe included. The shortcut key for finding a species record is [CTRL-F].
3. **Finding a specific record when you don't know the full species name.** What if you know the *kind* of bird you are looking for, but don't know its full name? You can still find it using the **FIND RECORD ...** button. For example, suppose you want to learn more about kinglets, but don't know the actual names of the representative species that are in this group of birds. In this case, simply press the **FIND RECORD ...** button and enter "kinglet" (without the double quotes). Note that the first record where "kinglet" appears somewhere in the bird's name (Ruby-crowned Kinglet, in this case) is displayed, and the FIND RECORD button turns into a **FIND NEXT ...** button. Click on the **FIND NEXT ...** button to display the next record matching the specified search criterion (the record for Golden-crowned Kinglet will now be displayed). To start a new search, press [CTRL-F] or keep pressing the **FIND NEXT ...** button until no additional matching records are found, in which case the **FIND RECORD ...** button will reappear.
4. **Querying the Reference Book database.** You can [query the database](#) by accessing the **SEARCH** menu and selecting one of the five available record set options.

If, after pressing **FIND RECORD ...** and entering the name of the species you are interested in, you get an error message informing you that the species record could not be found, it may be that the species name was incorrectly spelled by you or that the record for a particular species is not contained within the current record set. In either event, you have one of two options:

1. You can correct any spelling errors in the **FIND A RECORD** dialog box (for your convenience, this box remains active until you successfully locate the species you are searching for or until you explicitly **Cancel** the search).
2. Or, you can switch to a different record set which may possibly have the record you are looking for. To do this, simply access the [SEARCH menu](#) and **select one of the five record set options that are available.**

## Playing a Song

To play the song and/or call notes of the species whose species account is currently on display, simply press the **PLAY SONG** button. Please note that the **PLAY SONG** button will be disabled if there is no song recording in the database for the currently selected species. The shortcut key for playing the song of a species is [CTRL-G]. A bird's song may also be played while looking at its photograph in the Inflight Field Viewer.

## Displaying a Bird Photograph

To display a photograph of the species whose species account is currently on display, simply press the **SHOW PICTURE ...** button. Please note that the **SHOW PICTURE ...** button will be disabled if there are no photographs in the database for the currently selected species. The shortcut key for viewing the image of a species is [CTRL-I].

When you press the **SHOW PICTURE ...** button, the photograph of the species will be displayed in the [Inflight Field Viewer](#).

## Displaying Distribution Maps

To view the Distribution Map of the species whose species account is currently on display, simply press the **SHOW MAP ...** button. Please note that the **SHOW MAP ...** button will be disabled if there is no range map in the database for the currently selected species. The shortcut key for viewing the distribution map of a species is [CTRL-M].

When you press the **SHOW MAP ...** button, the range map of the species will be displayed in the [Inflight Field Viewer](#).

## LANIUS Software Secrets

LANIUS Software's North American Bird Reference Book also includes over 525 identification hints or secrets about the birds of North America. To view the secret for each species, access the **VIEW** menu and select **LANIUS Software Secret for this Species**. Please note that if this option is disabled, no secret has been entered for the species in question. All secrets were written by LANIUS Software.

## BBS Trend Data

On the left hand side of the [Reference Book form](#), the population trend for the species is shown. This trend is reported by the survey-wide results of the [Breeding Bird Survey](#), for the years 1966-1996. The U.S. Fish and Wildlife Service's BBS population trend estimates represent a measure of population change for a species over a period of time. These estimates are expressed as a percent change per year. The level of significance is represented by 0-4 stars, with 0 stars being least significant and 4 stars being most significant. Note that if no trend data have been recorded for a species then its BBS trend is indicated as 'N/A'.

## Status of a Species

The status of each bird, as recognized under the Endangered Species Act, is recorded for each species. To display the status of a particular species, click on the **VIEW** menu and select **Display Species Status**. If a species has no status recorded under the Endangered Species Act, then the status of a species will be recorded as "No Special Status."



## Querying the Database

If, after pressing **FIND RECORD ...** and entering the name of the species you are interested in, you get an error message informing you that the species record could not be found, it may be that the species name was incorrectly spelled by you or that the record for a particular species is not contained within the current record set.

In either event, you can switch to a different record set which may possibly have the record you are looking for. To do this, simply access the **SEARCH** menu, which allows you to query the database by searching all species by abundance (Common and/or Widespread Species), state/province, or family. In addition, you also have options for displaying the records for all species or just for a single species. Select one of the five record set options just described. If the function you select allows you to choose from a list, make your selection and press [Enter]. Note: if you prefer to access records using an alphabetized list of species names, access the **SEARCH** pull-down menu and choose the option for **Displaying a Record for a Specific Species ...**.

## Display My Bird Sightings

The North American Bird Reference Book is completely integrated with your [LANIUS Excalibur 2000](#) bird sighting database. Once you have entered one or more sighting records of North American birds into the LANIUS Excalibur 2000 database, you can quickly view these observations while you are browsing through the species accounts in the North American Bird Reference Book! To do this, simply access the **VIEW** menu and select **My Bird Sightings for This Species**. Your observations will be displayed on the screen. Press the [Esc] key to return to the North American Bird Reference Book.

## Taking a Quiz

When you think you know a certain number of birds by sight or sound, you can quiz yourself by displaying a random bird sighting or playing a random bird song. Press [CTRL-A] to display a random bird sighting. In response, the Reference Book will display a bird image in the [InFlight Field Viewer](#). Study the bird as long as you want, and attempt to identify it; then press [ENTER] to display the bird's identity.

Press [CTRL-B] to play a random bird song. As the song is playing, attempt to identify the bird. Following the song, the Reference Book will display a message box containing the bird's identity.

## Repairing the Database

The Repair Database utility (for the Reference Book) is available from the **FILE** menu on the [Main Menu](#) Form.

Damage can occur to a database if the database application is open and the computer system is not shut down normally (e.g., a power failure). **ALWAYS REMEMBER TO BACK UP THE XKREF.MDB DATABASE FILE REGULARLY TO AVOID DATA LOSS THAT CAN NOT BE RECOVERED BY THE REPAIR DATABASE UTILITY.**

If your database is behaving abnormally, and you believe that it has been damaged or become corrupted, then it may be necessary to run Repair Database. Note that if you have a recent backup of your database file, it is usually better to replace the damaged database file with the backup file.

If you don't have a backup file, or if your backup file was made a long time ago, it may be better to run Repair Database to attempt to recover as much data as you possibly can.

Repair Database checks all records in the database file, validates all system tables, and validates all indexes. After Repair Database is run, any data that could not be recovered are discarded. The program has no option to compact the Reference Book database after it has been repaired.

## Synchronizing Databases

The ability to display your bird sightings from within the North American Bird Reference Book is a valuable one, and it works because the Reference Book has a pointer for each species that points to the corresponding species in your [LANIUS Excalibur 2000](#) database. Currently, both databases are fully synchronized.

However, as time goes by, the ornithological scientists who keep track of bird names may change the name of one or more birds, decide that one bird species is actually two distinctly separate species, or decide that two bird species are actually representatives of a single species and should therefore be lumped as one species. When these decisions are made, you have the option of updating your LANIUS Excalibur 2000 bird sighting database to reflect the new changes (see the [Species Split and Species Merge](#) functions, described in the User's Manual and the Help file). If you should update your LANIUS Excalibur 2000 bird sighting database, or if you should receive an upgrade to the North American Bird Reference Book, you may find that the Reference Book needs to be calibrated to accurately point to all of the appropriate species in your LANIUS Excalibur 2000 database.

When this need arises, simply access the North American Bird Reference Book and locate the species account which is currently out of sync with your bird sighting database. When that record is on display, access the **FILE** menu and select **Synchronize Databases ....** Follow the instructions that prompt you for information.

## Export a Species List

As mentioned previously, accessing the **SEARCH** menu allows you to query the Reference Book, at which time you can choose to display a list of birds for a particular family, state, or province. Once this selection has been made, you have the option of exporting the Species ID Codes for the current record set to a file for use as a Species Check-List in your [LANIUS Excalibur](#) bird sighting database. To do this, simply select **Export Species ID Codes to File ...** from the **FILE** pull-down menu and follow the prompts on the screen; the Species ID Codes will be written to a file called LXEXPORT.TXT. For more information on how to use this export file, see [IMPORTING A SPECIES LIST](#).

## Access LANIUS Software's Home Page

When you want to learn the latest news about this software product and the other products available from LANIUS Software, why not visit us on the Web? The North American Bird Reference Book can take you there, with one mouse click! To do this, simply select **Access LANIUS Software's Home Page ...** from the **HELP** pull-down menu. This feature requires Internet Explorer or a Netscape browser to function properly.

## InFlight Field Viewer

When you press the **SHOW PICTURE ...** button or the **SHOW MAP ...** button on the North American Bird Reference Book, the photograph of the species or its distributional map will be displayed in the Inflight Field Viewer. When you use the Inflight Field Viewer, press the **SHOW NEXT IMAGE** button, if it is available, to display additional photographs of the same species; to view previous images of the same species, simply press the **SHOW PREVIOUS IMAGE** button. Press **EXIT FORM** or the [F11] key to return to the North American Bird Reference Book. Please note that the **SHOW NEXT IMAGE** button will only be available if there is more than one photograph of a species stored in the database.

A bird's song may also be played while looking at its photograph in the Inflight Field Viewer.



## Display Life List Total

Your Life List total can now be displayed on the [Main Menu](#). To do this, simply access the Main Menu's **EDIT** menu and click on **Display Lifelist Total**. Note that clicking this option once turns this feature on, and clicking it again turns it off.

## Invoking World/Default Species List on the Reports Menu

When generating reports on the Reports Menu Form, your Default List of bird names will be used to fill the Species Name list box. If you need to generate a report for a species that is not on your Default List, simply access the **DETAILED REPORTS** pull-down menu and click on **Invoke World List ...**. To redisplay your Default List of bird names, click **Invoke Default List ...** from the **DETAILED REPORTS** pull-down menu. This setting remains active only as long as you are working in the Reports Menu form; if you exit the form and later return to it, your Default List of bird species names will be on display regardless of what your previous settings were.

## Displaying Life List Total on the Main Menu

Your Life List total can now be displayed on the [Main Menu](#). To do this, simply access the Main Menu's **EDIT** menu and click on **Display Lifelist Total**. Note that clicking this option once turns this feature on, and clicking it again turns it off.

## Access the North American Bird Reference Book

You choose **REFERENCE BOOK ...** from the [Main Menu](#) to access the [North American Bird Reference Book](#). The Reference Book allows you to print written accounts, display photographs, hear songs, or look at distributional range maps for over 900 North American bird species.

## Flight

Birds are well adapted for flight. Those adaptations which allow birds to so successfully utilize flight in their day-to-day existence include:

**Low Body Weight.** This results from the feathers (instead of a thick outer skin) that cover the exterior surface of a bird. Feathers are the "strongest materials for their size and weight known". In addition, low body weight is attributable to the lack of teeth (and the heavy jaws that would be needed to support them), the thinning of the bones in birds' skeletons (many bird bones are hollow), the noticeable shortening of the intestine and the elimination of the urinary bladder, and the presence of air spaces or air sacs in the bones and body cavity, among other places.

**Streamlined Shape.** The streamlined shape of birds is also a result of the external layer of feathers, which serve to smooth out the otherwise angled, air-resistant surface of the bird's body. Like an airplane, the feathers of a bird also serve to provide a place into which the feet can be drawn during flight, further reducing air resistance. The keel-shaped sternum of birds serves to provide a location where the powerful flight muscles attach themselves to the breast.

**Overall Centralization and Balance.** The muscles which control locomotion, and the heavy organs of the abdomen (including the gizzard, which functions like a set of teeth), are centrally positioned toward the bird's center of gravity.

**Maximum Power.** Flight is no mean feat. In order to fly, an organism must go against the natural forces of gravity and air resistance. Birds are an excellent example of a group of organisms which are well-suited to the activity we call flight. Their internal body temperature is notably high, allowing them to survive in the various climate and weather extremes that may be encountered throughout the world; yet, their covering of feathers help them to conserve their body heat. In addition, they have an efficient cardio-vascular system, resulting from a high heart rate, rapid blood circulation, and increased oxygen-carrying capacity of the blood stream. Moreover, breathing and flight movements are synchronized with one another in birds; and their diet is highly selective and contributes very little to excess weight.

**Visual Sharpness and Rapid Response Time.** The combination of large eyes and a brain with enlarged visual and locomotor centers provide birds with exceptional distance-determination capabilities and the ability to quickly translate incoming visual or auditory cues into nerve impulses that control their flight with fine-tuned precision.

Although we at first tend to identify flight as a characteristic of all birds, it should be noted that some birds have lost the ability to fly. Sometimes, this occurs because a species finds its way to an area where flight is no longer necessary for its day-to-day survival. For example, consider those birds which live on isolated islands where all of their food may be obtained on or close to the ground and where there are no natural predators. In these situations, the need to fly, over time, becomes less important from an evolutionary standpoint.

This inability to fly is either manifested by the lack of wings or by the lack of wings which are large and strong enough to sustain the bird's body weight in the air. Some examples of flightless birds include ostriches (found in Africa), rheas (South America), emus (Australia), cassowaries (New Guinea and Australia), and kiwis (New Zealand). The ostrich, like some of the other birds mentioned here, is a good example of a bird which finds most of its life sustenance on or near the ground and has developed strong legs which are used to run at

high speeds from (or to defend themselves against) their predators. Penguins represent another well-known group of flightless birds; however, odd as they may appear, penguins have achieved a sort of "flight" under the water. There are also certain species of grebes, cormorants, and rails which lack the ability to fly.

Much of the evidence available today seems to indicate that birds developed from a reptilian ancestor, and many authorities now believe that birds are, in fact, modern dinosaurs. Although the origin of flight continues to be debated, two common theories postulate that flight arose from the evolutionary development of ground-dwelling organisms which needed to develop faster means of locomotion to either catch prey or escape from predators; or that flight arose from tree-dwelling reptiles which glided from tree to tree and eventually developed the adaptations for flight that we see today.

In flight, a bird's tail is used to help it maneuver through the air. In general, long-tailed birds have greater abilities to maneuver (twist and turn) in the air than birds with short or stubby tails.

Flight itself can be broken down into two broad categories: gliding (or soaring) and flapping. Birds which soar or glide, by definition can maintain or increase their altitude (height above the ground) without flapping their wings. This is achieved by soaring on currents of rising air (also known as static soaring) or by exploiting adjacent air currents of different velocities (also known as dynamic soaring). Static soaring most often occurs when a bird glides on top of upward-moving air currents that result from wind moving across an obstruction (e.g., a mountain or building) or from localized pockets of warm air which are otherwise known as thermals. Vultures often soar on warm air thermals. Since thermals result from heating of the Earth's surface (by the sun), you will often find that vultures don't begin soaring until about 10:00 AM, when the surface of the earth has warmed to a point where thermals begin to form.

At sea, air currents close to the surface of the ocean blow at speeds more slowly than air currents that are much higher above the surface. Birds such as albatrosses utilize the **momentum** they gain from gliding downward from the areas of faster wind velocities to aid them in using the slower wind velocities near the ocean surface to propel them upward again to their original altitude. This technique is known as dynamic soaring.

Other means of flight in birds are achieved by flapping. As should be readily obvious, the rate at which a bird flaps its wings is inversely proportional to its body size. Some birds are strong flyers (e.g., falcons), while other birds are weak flyers (e.g., rails or gallinaceous birds, such as grouse or quail). Even within the same family, differences in flight patterns are obvious. For example, if you study sparrows found in grassland fields, you will soon come to recognize the relatively strong, direct flight pattern of the Savannah Sparrow when compared to the notably weak, fluttery appearance of the Le Conte's Sparrow in flight.

While flapping, some birds can maintain their position in space -- and are therefore known to hover. You see this in American Kestrels, kites, Rough-legged Hawks, kingfishers, and, most notably, in hummingbirds.

#### **References Used in This Essay:**

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**Welty, J.C. 1975. The Life of Birds. 2nd Edition. W.B. Saunders Company. Philadelphia, PA. 623 pp.**

## What Makes a Bird a Bird?

Birds are everywhere. Yet, many of us go through our entire childhood and most of our adult life without having more than a very basic knowledge of what birds are. Consider this true story: in Iowa, the conversation of two young women on the Iowa State University campus was overheard as they walked from one class to the next. In the middle of their conversation, one of the women heard the song of a Northern Cardinal, which was singing in a small tree directly above them. "What is that bird?", she asked her friend. The second woman looked up, briefly studied the bird, and exclaimed, "I don't know." The women then continued on their walk, and resumed the conversation they had been engaged in only moments before. Many of us who have studied birds for years find it amazing that these two young women would not be able to recognize a species as common as a Northern Cardinal; yet, instances like the one just described probably happen more often than we think.

The novice bird enthusiast is usually first impressed by the diversity which exists in the bird world. Consider that many people only know of the birds in their neighborhood (e.g., the American Robin, Rock Dove, European Starling, and House Sparrow, to name just a few). It comes as no surprise, then, that many people are astounded when they learn that the number of bird species throughout the world exceeds 9000!

Birds have obviously been successful, from an evolutionary standpoint, as indicated by the numerous species which have developed around the globe. But what makes a bird a bird? The answer is a suite of factors, all in combination with one another. We will briefly list these factors below; and as we do, take note how many of these factors are directly or indirectly related to the adaptations necessary to allow birds to fly. In fact, **flight** is one of the defining traits of birds.

At a most basic level, birds are vertebrates, and for this reason, **all birds have a backbone**, which is the defining trait of vertebrate species. In addition, like mammals, **birds are warm-blooded**, which differs remarkably from the cold-blooded reptiles, from which birds are thought to have descended. Birds also have a **4-chambered heart**, which is also found in mammals; this allows the blood to be replenished or purified with fresh oxygen as it passes through the lungs and before it reenters the bird's body.

Of all the defining traits of birds, **feathers** is perhaps the most important. Feathers, combined with the development of wings and the ability to sustain energetic activity (i.e., warm-bloodedness) have facilitated the development of flight in birds. But birds would not be as efficient in flying were it not for other features. Consider for example that **many of the bones in birds are both hollow or fused**. Hollow bones reduce the weight that a bird needs to carry in flight, and fusion of bones provides for a sturdier internal frame, which is also needed in flight. The sternum in birds that have retained the ability to fly features a keel, to which the muscles of the wing are attached. In addition to feathers, hollow bones, and fused bones, **birds also have a set of air sacs** dispersed throughout the body cavity and even in some of the bones, which serve to add buoyancy to the flying bird. This system of air sacs augments the capacity of the lungs to purify the blood with fresh oxygen.

**Birds have no teeth**, a feature which achieves a lighter weight jaw, yet another adaptation for flight. In response to the lack of teeth, birds have a **gizzard**, which is used to grind up the food that a bird eats. (Many birds swallow small pebbles or grit which enter the gizzard and aid in the process of grinding up the food.)

**All birds lay eggs**, and it is fascinating to note that birds represent the only taxonomic class of vertebrates in which there are no species that give birth to live young.

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## Migration

From an evolutionary standpoint, birds are successful in part due to their ability to move to different portions of the Earth's surface when conditions in one area become unfavorable. Birds accomplish this movement through a process called migration. If you think of a warbler, which feeds largely on insects, you can probably understand why many of them fly to Central and South America for the winter, when insects are largely unavailable in the central and northern portions of North America.

The regular movement of a bird species between those geographic areas where it breeds and where it spends the winter is known as migration. While not all birds migrate, those that do are responding to some ecological change in their environment (e.g., reduction in food availability or loss of habitat, such as the freezing of lakes or ponds). In addition, some species have populations of individuals which are migratory (or migratory for only short distances) and other populations which are year-round residents and thus do not migrate.

Some birds exhibit an irregular, almost nomadic, pattern of movement (e.g., Red Crossbill) or may sporadically appear in large numbers in an area where it is not normally seen (e.g., southward irruptions of Northern Goshawks or Snowy Owls during some winters). While the distance covered by such movements is unarguably noteworthy, some ornithologists do not consider these irregular shifts in the distribution of a species to be true examples of migration.

Undoubtedly, there are many factors which may explain the phenomenon of migration. Birds which migrate may do so to move to areas: (1) of better climate; (2) where there is less competition for food or available habitat during the breeding season; (3) where they have more hours (i.e., longer days) to locate food for their young; or (4) where the risk of predation during the breeding season is reduced.

Much of the migration within North America occurs within four "flyways": the Atlantic, Mississippi, Central, and Pacific Flyways. Sometimes, the path taken by migrants in the spring is not the same as the one they take in the fall, due to food availability and/or habitat conditions. The American Golden-Plover and Blackpoll Warbler are two examples of migrants which fly north in the spring through the interior of North America but fly southward along the eastern coast in the fall. Another form of migration which we will mention briefly here is **altitudinal migration**. This form of migration occurs, for example, when a species which normally inhabits high elevation mountain ranges, moves downslope during the fall to spend the winter at lower elevations where weather conditions and/or food availability are more favorable.

Birds which migrate do so at speeds approximating 18-25 miles per hour in song birds and at faster speeds in ducks, hawks, shore birds and other strong fliers. Some birds migrate over considerably long distances. Perhaps the best example of this is the Arctic Tern, which breeds in regions of the Arctic and flies south each year to the antarctic to spend the winter months, a round-trip distance of some 36,000 km! Because many birds must migrate long distances without stopping, they stock up on food at strategically placed locations or staging areas, thereby building up their fat reserves in preparation for the long migration flights that they are about to take. Even if all other factors (e.g., weather, time of year, wind direction, etc.) are favorable for migration, a bird will not migrate until it has built up a sufficient amount of subcutaneous fat which it uses as a source of energy while flying over long distances.

Weather has a variety of influences on bird migration. Weather itself is a manifestation of the changing seasons; in the spring, warm weather begins to return, and in the fall, the days turn progressively colder. These changes in weather also coincide with the migratory

movements of many bird species. This is perhaps most evident in the Mississippi River valley, where waves of spring migrants arrive with the northward flow of moist, warm air masses from the Gulf of Mexico. What is somewhat ironic is that, once a bird is airborne and is in the process of migrating, the weather can quickly cut its journey short. Consider, for example, the example we just mentioned: spring migrants using warm, moist, southerly air flows from the Gulf of Mexico as an aid in their northward migration. Sometimes, the warm moist air from the south will meet with a colder air mass coming in from the northwest; when this happens, air conditions become quite unstable, and oftentimes thunderstorms will ensue. The result of all of this is that birds that have been migrating will drop back to earth en masse when they meet with the cold front. This scenario is likely the explanation for those times when you have gone birding on a spring morning just after a night of thunderstorms and found migrant birds in every bush, shrub, and tree.

Just as spring migration may be stalled by a cold front from the northwest, fall migration may be stalled by warm air currents from the Gulf of Mexico, especially during the hurricane season. For example, many birds will use northerly or northwesterly winds to begin migrating southward in the fall. If these conditions should suddenly meet with a warm air mass surging northward, air conditions again become unstable, and fog and rain are generally the result. The fall migration may be delayed for 1-3 days under these conditions, and make for some of the best fall warbler-watching opportunities that you will ever experience.

How does a bird know when to migrate? Many ornithologists believe that an internal biological clock is set to sound an alarm when the number of daylight hours, temperature, or rainfall increases or decreases to a certain value. When these conditions are triggered, a bird will begin its migration, unless inclement weather force it to stay put until better weather more favorable to migration returns.

You may have heard about the deaths of migrating songbirds resulting from their **overnight** collisions with radio towers and other high objects. Likewise, you may have been witness to a flock of geese or Sandhill Cranes descending in **mid-day** from a very high altitude to land in a wheat field during the fall migration. What is going on here? If you think about these facts, you may begin to realize that certain birds prefer to migrate at certain times of the day. For example, songbirds and other small birds often migrate at night, while larger birds, including hawks, pelicans, and herons, migrate during daylight hours. This strategy permits smaller birds to replenish their energy reserves (by feeding during the day) and to avoid many of their predators (by flying at night).

Admittedly, most birds perform their annual migrations safely, and arrive at their intended destinations without incident. But what about the unusual events in migration? The eastern warblers that appear on the west coast in the fall? The migrating bird that shows up northwest of its breeding range in the fall when it should have flown to its wintering grounds in the exact opposite direction? The answers to these questions are both simple and very complex. Obviously, birds are able to navigate, or orient themselves, during migration. However, how they do this, and why their navigation skills sometime go awry, are questions that continue to be debated today. It is believed that some birds have an inherited or innate sense of direction which guides them during migration. It is also thought that some birds use visual cues, the earth's magnetic fields, or the position of the sun or the stars as "pointers" that help them find their way.

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## Reproduction

The subject of reproduction in birds could be a book in itself, ranging from such topics as singing and territorial defense, courtship and mating rituals, and nest building to the laying of eggs, egg incubation, and the care of the young. Due to space limitations, this essay focuses primarily on the evolutionary development of egg laying as a reproductive strategy in birds.

Before going further, we wish to define the term "Clutch", which refers to the total number of eggs laid by a bird during one nesting attempt; the clutch size for North American birds may range as high as 14-15 eggs in some ducks and gallinaceous birds.

In any organism, the reproductive period has the potential of being an especially vulnerable time for both parents and young. It is at this time that the female becomes tied to a limited geographic area for an extended period of time, making her a target for an alert predator. Similarly, the young of a species are typically less able to walk or swim as fast (or for as long a period of time) as their parents. In response to these pressures, some aquatic species of vertebrates lay thousands of eggs which are later "abandoned". This strategy ensures that the parent's location is less likely to be predicted by a potential predator; and the large number of eggs laid guarantees that at least some of them will survive to adulthood.

In birds, however, a different strategy is undertaken: a bird lays significantly fewer eggs; in most cases at least one parent remains to care for the young; and the bird's ability to fly allows it seek out locations for nests that are as far away from natural predators as possible. In addition, birds develop an incubation patch, which is a relatively bare area of skin on the underside of the body that is used to help transfer the heat of the incubating adult bird to the eggs. By incubating their eggs, birds shorten the amount of time which would otherwise be spent waiting for the eggs to hatch; this time savings translates into less time spent under conditions which make the nesting birds potentially vulnerable to alert predators. This need to avoid the hazards of predation during the nesting season is also evident in the color patterns of many female birds: they are often dull in color, and it is thought that this feature makes them less conspicuous while they sit on the nest.

From an evolutionary standpoint, egg-laying in birds is probably associated with the development of flight in birds. Consider that birds represent the only taxonomic class of vertebrates in which there are no species that give birth to live young. In contrast to mammals, where the development of the young occurs within the mother's body, the yolk of the egg serves as "sustenance" to the developing bird embryo. But the differences do not stop there; during the non-breeding season, the sex organs of birds atrophy (i.e., decrease in size); this achieves a reduction in weight of the bird which translates into more efficient flight for the remainder of the year.

In birds, the egg consists of a yolk, which is surrounded by several layers of albumen (i.e., the white of the egg) which in turn are covered by two shell membranes and the shell itself. The egg albumen and the shell membranes are composed largely of protein, while the shell itself represents a large investment of calcium.

As you might expect, larger birds tend to lay eggs that are greater in size than the eggs laid by smaller birds. However, all other things being equal, those birds whose young hatch out in an advanced state of development (also known as precocial young) lay larger eggs than those birds whose young are altricial (i.e., at an early stage of development and essentially helpless at the time of hatching). Again, some of these differences may be explained by a species' need to minimize the risks of predation; for example, birds which nest on the ground in open areas (e.g., Killdeer) have young which hatch out and are able to walk at a very early age, whereas birds which nest in cavities can afford to have altricial young since

the risk of predation is relatively lower due to the protection afforded by the type of nest site.

Eggs come in a variety of colors, while some eggs consist only of one color or are white and lack any other colors. In general, if a bird nests out in the open (e.g., a Killdeer, which nests on the ground) or does not initiate incubation until all of the eggs have been laid (a process which may take several days), the eggs of such birds often have a variety of colors or squiggly lines or blotches on them; these markings or colors provide a form of "cryptic coloration" which helps disguise or hide them from potential predators. On the other hand, a bird which nests in a cavity or initiates incubation as soon as the first egg is laid (e.g., Mourning Dove) may have white eggs or eggs with a much more simpler color pattern.

A bird must time its egg-laying activity with other cues that are present within its environment. For example, egg-laying must occur at a time which ensures that incubation takes place at a time when it is neither too hot or too cold for the species in question; in addition, the young should hatch out at a time when food is readily available, to ensure a constant and easily located source of food for the fast-growing young. The time period which is most optimum for a bird to lay its eggs logically varies between species; birds which migrate to extreme northern latitudes may only have one opportunity to successfully hatch a brood of eggs while birds breeding in the southern United States may actually have enough time to raise two consecutive nests of young, a process known as **double-brooding**.

Eggs in small song birds may be laid at a rate of about one per day, until the entire nest or clutch of eggs is completed; larger birds typically show longer intervals between egg-laying events. Surprisingly, the Brown-headed Cowbird, which specializes in parasitizing the nest of other species, can essentially lay an egg "on demand": the female searches for the nest of a host species; when she finds it, she waits until the nest is left unattended by the parent birds, then races in and lays one of her eggs in the nest. Female cowbirds may also choose to remove one or more of the host's eggs from the nest. This process, known as brood parasitism, is highly developed in the Brown-headed Cowbird, a species which builds no nest of its own! Brood parasitism is also practiced, to some degree, in some species of North American ducks and cuckoos. Brood parasitism succeeds as a strategy because oftentimes the young parasite grows at a faster rate than the host species' young, and can therefore out-compete the latter for food that is delivered by the unsuspecting parent; as you might expect, brood parasitism typically lowers the nesting success of the host species in an area where parasitism rates are high.

The number of eggs laid (i.e., the clutch size) varies in response to a suite of factors, including natural mortality rates; nest size or the size of the bird; length of the period required for incubation and care for the young; and the amount of available food in the immediate environment, to name just a few. As an example, a species with high mortality rates (e.g., Northern Bobwhite) usually lays larger numbers of eggs per clutch than a species which has a longer expected life span (e.g., a Common Raven). In yet another example, the California Condor takes about six months to successfully raise and care for its young; the investment of so much time and resources can logically be expended on a limited number of young, and in this case, condors do not lay more than one egg per nesting attempt.

Sometimes during the nesting season, a bird may lose one or more of its eggs to a predator or some other random event. When this occurs, it may lay another egg or two to account for the ones that were lost. Birds that do this are said to be indeterminate egg layers. Other species lay a strictly fixed number of eggs, and will not replace an egg if it is lost to predation or accidental damage; such bird species are said to be determinate egg layers and will lay the same number of eggs per nest each year.

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## Identifying Birds

Bird identification is best thought of as a combination of art and science. Many good birders who are self-taught have certainly perfected the artistic side of bird identification. However, with formal training or an interest in reviewing published works in this subject area, practically any birder can begin to apply science to the process of bird identification.

This essay reviews those skills and techniques that we at LANIUS Software feel are necessary for birders to become good at identifying birds. Although this topic is directed at novice or beginning bird watchers, some of the more experienced birders may also find useful information here.

1. **Patience.** Patience is the first thing that we recommend all birders develop. Patience will reward you with both experience and knowledge. Consider, for example, the first time you ever heard a Red-eyed Vireo up in a tree. You probably did not know what the bird was, but its persistent song nevertheless caught your attention. As you waited and waited and waited and waited for the bird to appear from behind a tangle of leaves, the bird continued to sing, as if it were taunting you. At this point, many of those without patience will give up and walk away. However, we recommend that you try to stay calm, and remain focused on the objective of seeing the bird. In time, your patience will be rewarded with a view of the bird, a familiarity of its song, and the ability to connect that song with the bird's appearance. It should go without saying that this experience will pay off the next time you hear or see a Red-eyed Vireo!
2. **Avoid Competing With Others.** What makes birding fun is that most people approach it for what it is: a hobby or, in the case of professional ornithologists, a job. However, when we turn birding into a sport, we run the risk of ruining it for ourselves and for others. The birder who always must be the first in a group to yell out the identity of a bird or to announce that s/he has seen more birds in a day or in a year than anyone else actually does more harm than good. In the first place, this kind of activity makes other birders feel less inclined to continue birding with such a person; and secondly, the pressures that this implied competition forces on other beginning birders may convince them to give up birding altogether before they have an opportunity to really experience the excitement and enjoyment that birding can offer. Indeed, a birder who is focused on constantly competing with others may eventually experience his/her own "burnout" when the need to constantly practice one-upmanship takes all the fun out of birding.

Now, we are not saying that competition is all bad. In fact, we encourage it, but only in moderation. For example, **the best person to compete with is yourself.** If you saw 250 birds last year, why not try to see 255 birds this year? Or, if your first Louisiana Waterthrush of the season was on 29 March last year, why not try to see if you can find one before that date this year? Competition with your best friend can also be stimulating, as long as both parties agree to it. For example, you might want to see who between the two of you can find the most occupied nests in the county during this breeding season.

However, once competition becomes the dominant focus of a birder's life, basic birding skills can suffer. For example, competitive birders find it hard to admit they were wrong; and this leads us to our next topic.

3. **Always Be Open to Doubt Yourself.** As you look at a bird, it may sound familiar to you, but its appearance may be different somehow. For example, to continue on our previous vireo example, let's say that you are out birding during the spring

migration and hear another Red-eyed Vireo. Instantly, you say to yourself, "Ah, another Red-eyed Vireo." You patiently wait for the bird to appear and, when it does, you study its plumage -- only to find that the bird does not look like a Red-eyed Vireo. You listen again to its song, and yes, it does sound like a Red-eyed Vireo. Well, that's what it must be, then, right? The good birder will say "No" to (or at least not be willing to answer) this last question. Instead, another, more in-depth, study of the field guide reveals the presence of another species to consider: the Philadelphia Vireo. Now as you study the bird some more, you understand why there are traces of yellow on the throat and breast, and yes, you can hear a slightly slower and higher-pitched quality to the song, now that you know what to look for. By being willing to doubt your initial identification, you are now able to correctly identify this bird as a Philadelphia Vireo!

4. **What Family is it In?** The first objective of any bird identification is to determine what taxonomic family the bird is in. When we first start birding, most of us probably hauled out the field guide every time we saw a new bird and began leafing through it, starting at the first page (the loons and grebes) and proceeding to the sparrows. Depending on what field guide you are using, that may amount to turning 200 or more pages! For practical as well as scientific reasons, our first objective should be to limit the number of species we have to consider as we attempt to identify a bird.

This is not too hard to do, once you know some secrets about how it is done. Consider, for a moment, what comes to mind when you think of two different bird groups, the jays and crows (family Corvidae) and the sparrows (part of the family Emberizidae). If you said something like "Crows, ravens, and jays have large, thick bills, are usually black in color, or have blue, gray, or green colors, and usually range in size between that of a robin and a hawk; whereas sparrows are typically small birds which are predominantly brown or buffy in color (but sometimes with rufous, gray, black, or white colors), and have short bills that usually have a conical shape" then you are already on your way to becoming a good birder. Each bird family has certain key traits which can often be used to distinguish the birds in that family from birds of other families. For example, woodpeckers are usually robin-sized birds (sometimes smaller, occasionally larger) that cling to trees, have a dagger-like bill, and are mostly black, white, or red in color; representatives include the Downy and Hairy Woodpeckers, Nuttall's Woodpecker, and Pileated Woodpecker.

Study your field guide and learn to recognize the traits of individual families. Then, when you see a bird, try to associate the characteristics of the bird in question with a particular family of birds. Now you can go directly to the 4-20 or so pages in your field guide that pertain to that specific family, and you will find that the process of identifying birds will become progressively easier over time. Obviously, it is best to have a field guide that is arranged closely according to the taxonomic relationships among birds; field guides that arrange their birds into color groups or by habitat will not be as useful when applying these recommendations.

5. **What is the Behavior of the Bird?** Once the bird has been tentatively identified to family, you must then drill down to more specific details in order to identify the exact species that it represents. In order to do this, you must study its behavior, its plumage (color), its habitat, and any vocalizations it might make. As far as behavior goes, you need to consider some basic questions: is the bird active and flitty like a kinglet, or relatively sedate and slow-moving, like a bittern? Is it shy, or does it allow you to approach its position without any visible alarm? For example, the Louisiana Waterthrush, which looks a lot like its close cousin, the Northern Waterthrush, is much more shy than that species. As you approach a waterthrush, you will find that if it refuses (by constantly flying away) to allow you to get close to it, it will in most



cases turn out to be a Louisiana Waterthrush in the final analysis.

Other questions to ask include whether the bird wags its tail (e.g., Prairie Warbler), or bobs the rear part of its body up and down (e.g., Spotted Sandpiper); whether it feeds on the surface of the water (e.g., Mallard) or prefers to dive underneath the water in search of food (e.g., Lesser Scaup). Does it peck at its food on a sandy beach (e.g., Least Sandpiper) or does it probe deeply into the exposed mudflats (e.g., Long-billed Dowitcher)? If it is a falcon, does it perch on a telephone wire (if so, it's most likely an American Kestrel, compared to Merlins which seldom, if ever, exhibit this behavior). Does it aggressively scratch the surface of the ground while feeding, like a Fox Sparrow or towhee, or does it prefer to just sift through available seeds and other food items that are already exposed (like a Chipping Sparrow)?

We could go on and on, but you probably now see that all of these examples should be pointing you in the direction of building your own mental database of bird behaviors. Then, when you are in the field, the mere act of seeing a bird performing some specific action should help you narrow the list of possible candidates for the bird's identification. For example, a bird bobbing its rear end should trigger in your mind the possibility of its being a waterthrush (Northern or Louisiana), Spotted Sandpiper, or Wandering Tattler, to name just a few species. Now you can use other features (see below) to clinch the identification.

6. **What Color Is It?** Answering this question is not as easy as it may seem. Not all birds are as uniform in color as the male Mountain Bluebird or the adult Glaucous Gull. Many species have different colors depending on the season (breeding versus winter seasons), or the sex or age of the bird. Also, keep in mind that under most conditions, you will only have a few seconds to a couple minutes to study the bird before it flies off or moves out of sight into the vegetation.

For these reasons, you must teach yourself how to quickly recognize key features of a bird's plumage or the color of its soft parts (i.e., the bill and legs). There are several techniques to do this. First, we recommend that you always carry a field notebook with you, or at least have a field notebook in the car; this will be used to record a description of the bird while it is still fresh in your mind. Secondly, don't be afraid to verbally (out loud) describe the bird as it appears to you; by hearing your own voice describe the bird, it becomes easier to commit the key elements of its color and behavior to memory. And finally, learn to recognize those parts or features of the bird that are oftentimes most useful to identification: leg color, presence or absence of wing bars or wing patches, breast color (also, is it streaked or barred on the chest, or does it have a uniform color on the chest), back color patterns, tail color, and any noticeable features on the side of the face, including presence or absence of an eye ring. If you are very observant, you will notice we have essentially just described nearly all visible parts of the bird's body. This is no accident; by committing to memory this list of body parts, it will be easier to run down each of these elements of a bird's plumage during the hectic few seconds that are available to you when a new species lands in the tree ahead of you.

From a scientific standpoint, we can help capture the overall color of a species by taking a photograph or videotape of the bird. With modern technology, we can blow up still shots of a photograph and study the bird in minute detail, especially when it happens to be a species that is difficult to separate from similarly appearing species.

7. **What is its habitat?** Whether you intend to do it or not, every time you see a bird species you will incrementally begin to build an association index between that species and the habitat it prefers to use. Before long, you will know that plowed

fields, short-grass pastures, and other open areas with scattered patches of bare ground and short grass represent suitable habitat for the Horned Lark. Seeing an Ovenbird and being in a forested woodland tend to go hand in hand, as does seeing a loon and being in or near water. When you see a bird, the process of identifying it in many ways depends on how well you understand the habitat it is in. For example, seeing an *Empidonax* flycatcher in late June in a wooded ravine may point more closely to Acadian Flycatcher as opposed to seeing it in a thicket of willow trees near water, at which point Willow Flycatcher would be the species more likely to consider.

There are many habitat classification schemes that exist today. When attempting to describe a specific habitat type, you will not be expected to be an expert on any one of these classification schemes; instead, all that is asked is that you do the best that you can at describing the bird's habitat, given your level of knowledge of habitat associations.

Again, from a scientific standpoint, formal research studies can be launched to determine the specific habitat elements which are important to a species. For example, we all know that a wetland marsh is good habitat for a Virginia Rail; however, research aimed at identifying the specific habitat attributes needed by Virginia Rails may focus on exactly what size of marsh, what depth of water, which species of plants, or what kinds of vegetative structure are most conducive to successful breeding in this species.

8. **What Does it Sound Like?** We at LANIUS Software strongly believe that **learning songs is perhaps one of the best bird identification techniques one can acquire**. It is best to learn your songs as soon as possible after developing an interest in birds. In general, the younger you are and the earlier in your birding career that you take an interest in bird songs, the more successful you will be in acquiring an ability to identify birds solely by their song or call notes. Occasionally, job announcements appear that request applications for bird census work; in order to be hired for such work, one oftentimes needs to be able to demonstrate an ability to recognize birds by song or call notes. The reason for this is simple; bird census work usually involves visiting a fixed number of sample points in a limited time period during the morning hours. You only have so much time to spend at each point and to travel between points; if you have to spend five minutes tracking down every bird you hear before you can positively identify it, you would never be able to sample all of your census points before the morning census period expired.

To more fully appreciate what this means, consider that perhaps 70-80% of the birds documented at a woodland [Breeding Bird Census](#) stop are birds that are never seen by the census taker; indeed, they are birds that have been identified on the basis of song and/or call note only!

Again, from a scientific standpoint, you can record the songs or call notes of a species for further study or as aid in identification. A good hand-held tape recorder can oftentimes record the voice of a loud singer, but more expensive equipment is needed to make the kinds of high-quality bird song recordings which are available in the North American Bird Reference Book. Once a recording of a bird's voice has been made, you or other ornithologists have an opportunity to study the recording in minute detail, if necessary, to validate the identity of the bird.

9. **I Found a Rare Bird, What Do I Do?** This answer is easy. First, don't panic. Second, simply review all the points we have discussed thus far. In other words, be patient; don't try to rush the bird or hurry to get the best available viewing angle. If you are in a group of birders, don't feel compelled to make an instant identification; it

can be quite a humbling experience to yell out a bird name only to find out minutes later you were wrong and that you missed one or two obvious field marks. Have an open mind, and consider all of the possible species which could potentially represent the true identity of the bird. While all of this is going on, you have probably already figured out which family the bird is in and even begun to identify certain coloration patterns of the bird's plumage. This is when you pull out your trusty field notebook and begin writing down the details of your observation. Note the date, the time, and the habitat the bird is in. Also record the field marks of the bird (i.e., the color and/or color patterns of the wings, tail, head, back, breast, legs, and bill), its song or other vocalizations, and its behavior. Once you believe you have identified the species, articulate why you feel this identification is correct; this is best done by mentioning other similarly-appearing species and for each one, explaining why the bird being documented is not that species.

10. **Collecting Birds.** At one time, collecting birds with a gun was standard practice when it came to accurately identifying them. This was, of course, before powerful binoculars and spotting scopes were widely available for use in studying birds. Currently, most ornithologists frown on the need to collect a bird, and you would likely generate a fierce debate if you ever advocated collection of birds for the mere purpose of documenting their occurrence in an area. This is not to say that collection itself as an activity no longer has merit or application in the field of ornithology. In fact, it is still sometimes prudent to practice the science of collecting birds, especially when it is apparent that the bird in question may be new to science (i.e., never before seen or described in the literature). In other instances, birds which have met an untimely fate (e.g., vehicle collision, radio tower collision, wounded by hunters, etc.) may be collected when appropriate and turned over to scientific institutions (e.g., museums or universities) where they may contribute to our understanding and knowledge of birds.

## Number of Days Birded By Minor Area

What this report does: This report calculates and returns the number of days spent birding in each of the Minor Areas for a selected Major Area. When you execute the report, you specify the Major Area to be used for the calculation. For example, to calculate the number of days spent birding in each of the **Counties** (i.e., Minor Areas) of the **State** of California (i.e., a Major Area), simply select "California" from the list of available Major Areas when you run this report.

Output: The output for this report may be sent to the screen, a printer, or to a [File on Disk](#).

