

South Florida/Caribbean Network

National Park Service
Inventory and Monitoring Division



Standard Operating Procedure CNB06

Data Entry, Data Proofing, and Reporting—Version 1.1

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Summary

The purpose of this SOP is to describe the procedures for data entry, data proofing and data reporting.

Revision Log

Revision Date	Author	Changes Made	Reason for Change	New Version #
3/24/2020	Robert Muxo & Judd Patterson	Minor edits to clarify database details and archiving procedures as well as the process to assign and update Data Processing Levels. The table and field descriptions were also moved to this SOP from the narrative. Clarified that reporting is primarily via the South Florida Wading Bird Report	Keeping SOP current with database improvements and archiving procedures and to implement the usage of Data Processing Levels.	1.1

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Introduction

Both the field observation and photo processing data sheets are entered directly into a Microsoft Access database. Appendix A includes a detailed list of table and field descriptions. This database is located at: Z:\SFCN\Vital_Signs\Colonial_Nesting_Birds\data\SFCN_ColonialBirds.mdb

When the Access database is opened, it shows a startup form with buttons for common database tasks and a brief database summary (Figure 1). Clicking on one of these buttons allows for data entry, data viewing/editing, report viewing, and producing graphs.

SFCN Colonial Bird Monitoring Database

database last modified 08/22/2017

Which task would you like to perform?

Add Survey View/Edit Survey View Reports Open Graphing Template

Database Summary:

Number of Surveys: 134 Latest Survey: 12/5/2019

 Double-crested Cormorant Observed nesting on 111 surveys High nest count: 1047 (Apr 2014)	 Roseate Spoonbill Observed nesting on 33 surveys High nest count: 12 (Jan 2011)
 Great Blue Heron Observed nesting on 71 surveys High nest count: 12 (Apr 2015)	 Reddish Egret Observed nesting on 14 surveys High nest count: 2 (Apr 2019)
 Great White Heron Observed nesting on 85 surveys High nest count: 41 (Jan 2018)	 White Ibis Observed nesting on 31 surveys High nest count: 93 (Jul 2016)
 Tricolored Heron Observed nesting on 9 surveys High nest count: 5 (May 2018)	 Osprey Observed nesting on 5 surveys High nest count: 2 (Mar 2010)
 Great Egret Observed nesting on 52 surveys High nest count: 25 (Feb 2018)	 Bald Eagle Observed nesting on 19 surveys High nest count: 2 (Feb 2009)

Figure 1. Startup form for the SFCN Colonial Bird Monitoring Database.

Data Entry

Clicking the 'Add Survey' button will open a form where all the information for a particular bird flight can be entered. This includes flight information, photo processing information, as well as the information harvested from the actual photographs (Figure 2).

SFCN Colonial Bird Monitoring Data Entry

NPS Park Unit: Front Observer:
Flight Date: Photographer:
Report Date: Aircraft:
Weather Conditions: Pilot:
Temperature (C): Survey Type: ☐ Not Flown
Wind Direction (deg.): Survey Method:
Wind Speed (knots):

Colony Name:
Processing Date: DPL:
Photo Processor: ☐ No Nests Photographed? DPL Name:
Comments: ☒ Checked?

Photo Filenames (pulled automatically from ThumbsPlus)

Species	P: Occupied nests	P: Nests with chicks	P: Nests with eggs	P: Empty nests	Birds observed	Active nests observed
DCCO	2				39	
GWHE	3		2		2	
ROSP					4	
LARI					1	
*						

Colonies: 1 of 9 | No Filter | Search

Figure 2. SFCN Colonial Bird Monitoring Data Entry form.

The data entry form is designed to flow from top to bottom. The first pieces of information entered should be the NPS park unit, flight date, any applicable weather conditions, the name of the front observer and photographer, aircraft used, the name of the pilot, the type of survey, and the survey method. The park and flight date are absolutely essential, and if they are not entered, nothing will be saved for the flight.

For a month during which a survey was missed, enter the appropriate value in “NPS Park Unit”, “Survey Type” as “Routine”, the “Flight Date” as MM/15/YYYY to give a date in the middle of the month, and click the checkbox labeled “Not Flown”.

The remainder of the form applies to a particular colony during a flight. This section is filled out by first selecting a colony name, which will automatically be limited to those in the current park unit. Additional details such as the processing date, name of the photo processor, and comments are also recorded here. If no nests were observed in the photographs, the checkbox next to ‘No Nests Photographed?’ is checked. Otherwise, proceed down the form to the remaining sections. If any photographs have been tagged for this colony in ThumbsPlus, they will automatically show up as hyperlinks in the Photo Filenames section. Clicking on one of these photo links will open it in your web browser. Photographs can still be tagged in ThumbsPlus after data entry, and they will automatically link to the field data.

Finally, all the bird and nest observations need to be entered in the lowest part of the form in the section that looks much like a spreadsheet. For each species, select the species name from the first box, and then proceed to enter the number of occupied nests, nests with chicks, nests with eggs, and non-occupied nests observed in photographs. The final two boxes allow for the entry of estimated bird/nest count observations from the helicopter. These are useful because sometimes a species is routinely observed such as Magnificent Frigatebird (*Fregata magnificens*) but has not yet been shown to nest in Biscayne National Park. There are also rare situations where the front observer might spot several nests from the air, but for some reason those nests could be missing from the photographs. In situations like this, the observation from the helicopter would alert us to a problem.

The Data Processing Level (DPL) is automatically set to ‘Raw’ for new data. This is not changed during the initial data entry. The DPL will be adjusted during the Data Proofing process.

When all the data for a colony have been entered, click the small arrow button near the bottom of the form (Figure 3) to advance to a blank record where an additional colony can be entered. The small backward/forward arrows in this same region of the window allow for movement between the colonies that were visited during a flight.

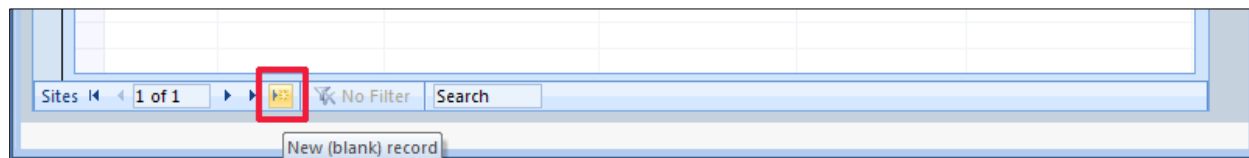
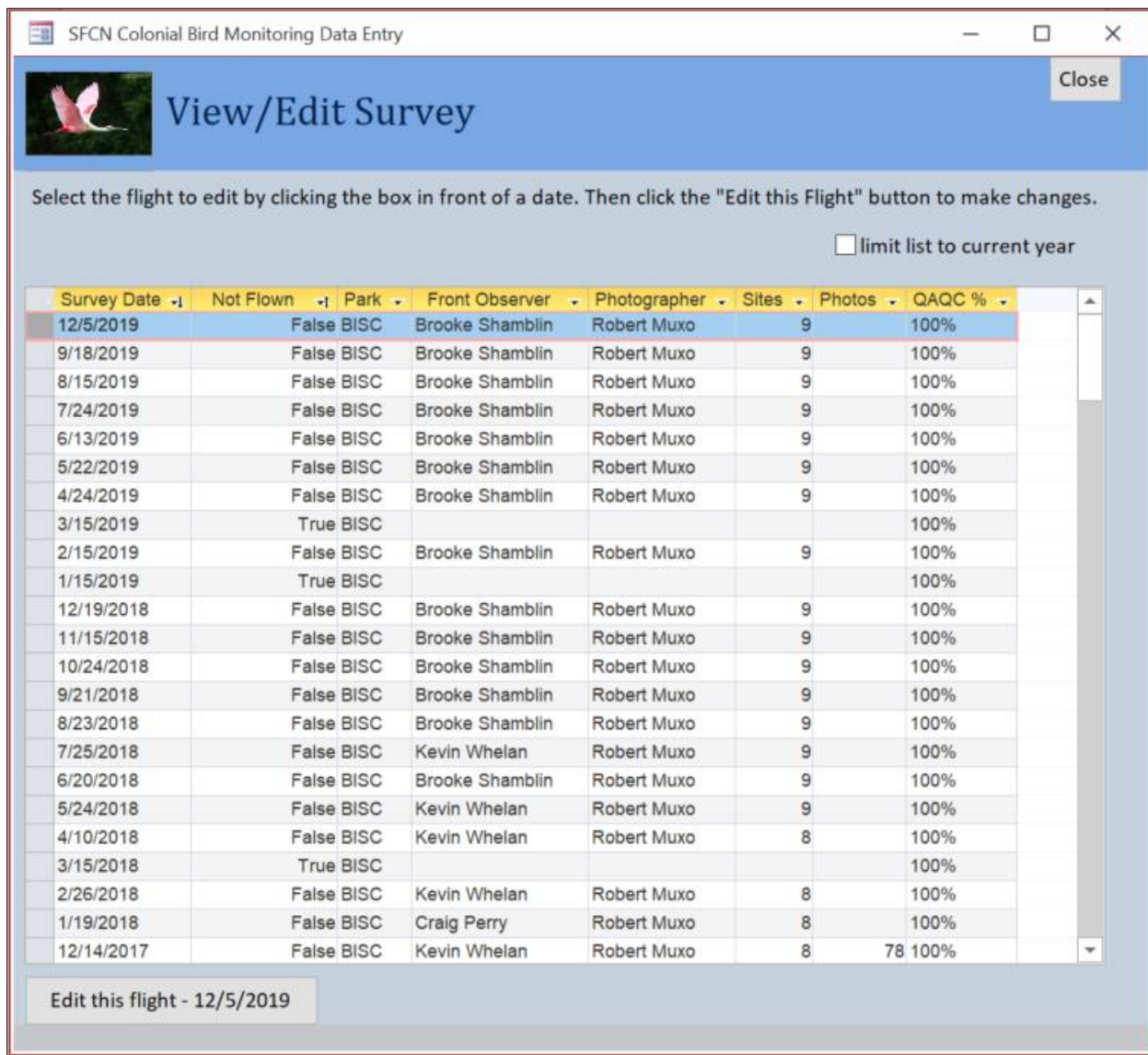


Figure 3. Clicking the arrow inside the red box allows you to proceed to the next colony for data entry.

When done with data entry for the entire flight, click the ‘Close Form’ button or the X in the upper right of the form to return to the startup form. Within Microsoft Access all data is saved as it is typed into a form. Click the ‘Add Survey’ button and repeat the data entry steps for each additional new survey.

To edit a survey that has already been entered (either completely or partially), click the ‘View/Edit Survey’ button and another form will show all the surveys that can be edited. Click on any part of the row for the desired flight to select it (Figure 4). When this occurs, the button on the lower left side of the screen will update to show the date of the flight about to be edited. Confirm this decision by clicking this button. The standard data entry form will appear on screen prefilled with any existing data for that flight. If necessary, click the small backward/forward arrows near the bottom of the form (to the left of “Sites”) to move between the various colonies that were visited on this flight.



SFCN Colonial Bird Monitoring Data Entry

Close

View/Edit Survey

Select the flight to edit by clicking the box in front of a date. Then click the "Edit this Flight" button to make changes.

☐ limit list to current year

Survey Date	Not Flown	Park	Front Observer	Photographer	Sites	Photos	QAQC %
12/5/2019	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
9/18/2019	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
8/15/2019	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
7/24/2019	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
6/13/2019	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
5/22/2019	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
4/24/2019	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
3/15/2019	True	BISC					100%
2/15/2019	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
1/15/2019	True	BISC					100%
12/19/2018	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
11/15/2018	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
10/24/2018	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
9/21/2018	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
8/23/2018	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
7/25/2018	False	BISC	Kevin Whelan	Robert Muxo	9		100%
6/20/2018	False	BISC	Brooke Shamblin	Robert Muxo	9		100%
5/24/2018	False	BISC	Kevin Whelan	Robert Muxo	9		100%
4/10/2018	False	BISC	Kevin Whelan	Robert Muxo	8		100%
3/15/2018	True	BISC					100%
2/26/2018	False	BISC	Kevin Whelan	Robert Muxo	8		100%
1/19/2018	False	BISC	Craig Perry	Robert Muxo	8		100%
12/14/2017	False	BISC	Kevin Whelan	Robert Muxo	8	78	100%

Edit this flight - 12/5/2019

Figure 4. This page is used to edit or view flights previously entered by selecting the appropriate date. In this screenshot the 12/5/2019 Survey Date has been selected.

Data Proofing

Once all data have been processed and entered, the SFCN data management plan requires 100% verification of the data entry. This is completed by first printing out a report of the data and manually comparing the printout to the original datasheets. To print this report, click the “View Reports” button on the startup form and click the “Data Verification Report” button. This automatically generates a report for all survey/colony combinations that are not already set as verified. This report (Figure 5) can then be printed and any discrepancies with the original datasheets are marked in red pen so the project leader can review and correct them in the database. The project leader also initials and dates the printouts when the corrections have been entered into the database.

Species	P. Occupied	P. Chicks	P. Eggs	P. Empty	O. Observed	O. Active
LARI					1	
ROSP					4	
GWHE	3		2		2	1
DCCO	2				39	3

Figure 5. Data Verification report used for 100% data verification.

The second stage of verification is to ensure that the photographs stored on the server are linked to the correct survey/colony using ThumbsPlus. This is done by viewing each colony in the database

and confirming that hyperlinked filenames appear in the “Photo Filenames” section of the data viewing form. If photographs are not visible, they can quickly be added using the steps in SOP CNB04 *GPS Track Downloading, Photo Downloading and Archiving, Photo Geotagging, Photo Renaming, and Photo Tagging in ThumbsPlus*—Version 1.1 (SFCN 2021).

When data verification has been completed for each colony, click the “Checked?” checkbox in the middle-right of the form and select the name of the person who did the verification from the drop-down menu that appears. This provides an easy way to follow the progress of data verification. Adjust the DPL for each survey/colony from ‘Raw’ to ‘Provisional’ at this point to indicate the increase in data quality.

Additionally, the SFCN data management plan requires a 10% check of the verified data as an additional safeguard against data errors. This 10% check starts by running a query that randomly selects 10% of the flight date/colony pairs between two given dates. To locate this query, click the “View Reports” button on the startup form and click the “Data Check: 10% Random” button. Follow the on-screen prompts to set a start and end date for the random draw, and a query will be displayed with a random selection of flight/colonies pairs. Each chosen flight date and colony is viewed within the database and the data checked against the original datasheets. If any errors are found, that particular flight must go through 100% verification again.

After the 10% verification, the data are nearly ready for distribution. Before this occurs, the ecologist completes additional exploratory data analyses (e.g. graphing, comparing to previous values, etc.) to identify anomalies and patterns in the dataset. Once the ecologist is satisfied with the dataset, the DPL is changed to either “Certified” (if a QAP exists) or “Accepted” (if no QAP is in place). This change will lock the data editing for that particular survey/colony to prevent changes. If updates are found to be necessary, those changes must be logged and shared along with the dataset.

The South Florida/Caribbean Network developed an additional QA/QC check where two observers will compare 5% of each person’s circled photos. An R script was developed to select 5% of the photos from the “Uncircled” folder of photos. The 5% check will occur at the photograph level and will involve a second observer comparing their circled photographs to the previously circled photographs for differences such as incorrectly circled nests, nests marked with the wrong development stage, or nests that were not circled. If this check reveals a large number of discrepancies, the protocol lead or data manager may search for the source of the discrepancy, require additional training for the technicians or require additional images to be reviewed.

Quick Reports

To generate and view/export/print quick data reports, click the ‘View Reports’ button on the startup form. The form that appears (Figure 6) accepts user input of several options before a data summary query is displayed on screen. This query can be copied and pasted into another program or exported by clicking the “External Data” tab and choosing “Excel” from the Export section.

Figure 6. Several basic data summaries are available after clicking the “View Report” button.

Data Sheet Storage and Photograph Storage

The colonial nesting bird monitoring effort produces printed photographs, field data sheets, photo processing data sheets, and print outs during data verification. The data sheets and processed photographs are placed in binders by year, month, and island colony (in alphabetical order). The DVDs containing photographs and GPS data are also stored in the same binders. These binders are stored in the SFCN office, available for reference and review.

Data Summary Report

For the first year, a sample data summary report has been included in the protocol narrative (Muxo et al. 2022) and can be used as a template for creating the first data summary report for Biscayne National Park. In subsequent years, the easiest approach will be to simply edit the previous year’s data summary report and update the tables and graphs as it will have received formatting review from the WASO office, and any problems will have been fixed. The wording of the introduction and methods section require only minimal changes to describe the new year’s monitoring.

The SFCN annual reporting for this protocol is accomplished by submitting a report to the South Florida Wading Bird report. The South Florida Wading Bird Report is a comprehensive regional report of nesting birds (many of which include our focal species) throughout specific south Florida areas such as the Water Conservation Areas and the Everglades. The SFCN submission to the South Florida Wading Bird Report is a condensed version (because of space limitations in the South Florida Wading Bird Report) of the annual summary data report template contained in the protocol narrative. The SFCN report is sent to the South Florida Water Management District and they publish it as part of the South Florida Wading Bird Report. If there is time and need the SFCN has the option to produce an annual report via the National Data Series (NRDS) as well.

The following steps take place if the SFCN prepares a data summary report to meet the National Data Series template for reporting.

1. Check to make sure no new data summary templates (NRDS) have been released by checking <https://www.nps.gov/im/report-templates.htm>. If the date on the latest template is after the publication date of the previous version of the data summary, then the contents will need to be shifted to the new format. This helps ensure the report meets all NPS requirements.
2. If there is no new template, then simply save last year's report with a new name and update the report methods with specific flight dates, any specific changes in implementation of the protocol, etc. from that year.
3. Work with the Assistant Data Manager to update Figure 1 as necessary.
4. Note: For graphs to display correctly, missing months when flights did not occur must be entered into the database as described in the Data Entry section above.
5. Open the colonial nesting birds database (SFCN_ColonialBirds.mdb) and click the "Open Graphing Template" button (See Figure 1). The database exports the photograph analysis data and field observation data from the colonial bird surveys into the graphing template: ..\Colonial_Nesting_Birds\data\BISC\Graphs\ Colonial_Birds_Graphing_Template.xlsx

The file will open automatically. SAVE IT TO A NEW FILE NAME BEFORE MAKING ANY CHANGES SO YOU DO NOT OVERWRITE THE TEMPLATE.

6. Click the "Data" worksheet tab at the bottom and verify that all the data have exported into the template as anticipated (Figure 7). It is particularly important to ensure that the most recent data have been added.

	Start Date	Loc Name	Species	Common Name	Family	Order	Photo Occupied Nests	Photo Nests With Chicks	Photo Number
4	4/19/2011	Soldier Key	GWHE	Great White Heron	Ardeidae	Ciconiiformes	1		
5	4/19/2011	Soldier Key	DCCO	Double-crested Cormorant	Phalacrocoracidae	Pelecaniformes	140	6	
6	4/19/2011	Ragged Key 5	DCCO	Double-crested Cormorant	Phalacrocoracidae	Pelecaniformes	296	33	
7	4/19/2011	West Arsenicker	BAEA	Bald Eagle	Accipitridae	Falconiformes	1	1	
8	4/19/2011	West Arsenicker	GREG	Great Egret	Ardeidae	Ciconiiformes	8	2	
9	4/19/2011	West Arsenicker	UNID	Unidentified					
10	4/19/2011	West Arsenicker	GBHE	Great Blue Heron	Ardeidae	Ciconiiformes	2	2	
11	4/19/2011	West Arsenicker	GWHE	Great White Heron	Ardeidae	Ciconiiformes	4	2	
				Threskiornith					

Figure 7. After the graphing template opens click on the "Data" worksheet (circled).

7. To update the species list (protocol narrative Table A-1), click on the "SpeciesList_tbl" worksheet. From this worksheet change the SampleYear (highlighted in yellow) to the current year (Figure 8).
8. Review the list of species for any that are important to highlight in the written text. For example, if Brown Pelicans or Magnificent Frigatebirds were detected nesting in the park, this would be important news to highlight in the written summary and additional graphs may need to be tweaked to show these new species.

	A	B	C	D	E	F
1	SampleYear	2013				
2						
3			Values			
4	CommonName	SpeciesCode	Photographed nests	Field Observed Birds		
5	Anhinga	ANHI	4	9		
6	Bald Eagle	BAEA	1	2		
7	Black-crowned Night-Heron	BCNH		5		
8	Brown Pelican	BRPE		73		
9	Double-crested Cormorant	DCCO	4260	3686		
10	Great Blue Heron	GBHE	25	36		
11	Great Egret	GREG	72	99		
12	Great White Heron	GWHE	74	125		
13	Laridae family gull	LARI		3		
14	Laughing Gull	LAGU		10		
15	Little Blue Heron	LBHE	1	24		
16	Osprey	OSPR		4		
17	Roseate Spoonbill	ROSP	8	34		
18	Royal Tern	ROYT		2		
19	Snowy Egret	SNEG	1	21		
20	Tricolored Heron	TRHE	1	144		
21	Turkey Vulture	TUVU	1	35		
22	Unidentified	UNID	30	5		
23	Unidentified Dark Bird	UNDA	3			
24	Unidentified White Bird	UNWH	29	64		
25	White Ibis	WHIB	131	170		
26	White-crowned Pigeon	WCPI		4		
27	Grand Total		4641	4555		

Figure 8. Screenshot showing SpeciesList_tbl worksheet with the year to be adjusted in yellow and the selected range to copy into a report.

- Highlight the table from Row 4 to the end, right-click and select “Copy”.
- Switch to or open the data summary report. Delete Table 1 by clicking on the “+” in the upper left-hand corner of the table, right-click, and select “Delete Table” (Figure 9).

↓

Table 1. List of species detected in 2013. Numbers in this table should not be used as true abundance estimates as nests and birds were likely observed during more than one sample period.

CommonName	SpeciesCode	Total Photographed Nests	Total Field Observed Birds
Anhinga	ANHI	4	9
Bald Eagle	BAEA	1	2

Figure 9. Screenshot showing point to click on a table that selects the entire table for easy deletion.

- Right-click to insert the new table and select “Paste” then “Keep Source Formatting” (Figure 10). This pastes the table in as a MS Table but formatted like it is in Microsoft Excel. Reformat the table as desired.

Table 1. List of species detected in 2013. Numbers in this table should not be used as true abundance estimates as nests and birds were likely observed during more than one sample period.

CommonName	SpeciesCode	Photographed nests	Field Observed Birds
Anhinga	ANHI	4	9
Bald	EA	1	2
Bald	NH		5
Brown	PE		73
Double-crested Cormorant	DCCO	4260	3686
Great	GBHE	25	36

Figure 10. Screenshot showing the “Keep Source Formatting” button. This should be used for pasting already formatted tables from Microsoft Excel.

12. For percent nesting by month (protocol narrative Table A-2), switch to “PctNestByMonth_tbl” worksheet. Adjust years displayed as necessary by first clicking on a year to activate that field, then clicking on the “filter” symbol (Figure 11) and selecting the years to display. In the example below, 2009 is not included as half the year is missing, and 2014 should be unclicked as this sampling year is not yet complete. Currently the table used “Conditional Formatting” to highlight months with >0% nests and highlight in dark blue months with > 20% nests recorded (these can be changed). Delete Table 2 in the report and copy and paste the table as described above. The “Grand Total” column is not needed nor is the first row with “Sum of TotalActiveNests”. Delete the 0% in cells for which there was no flight. Reformat table within MSWord if desired.

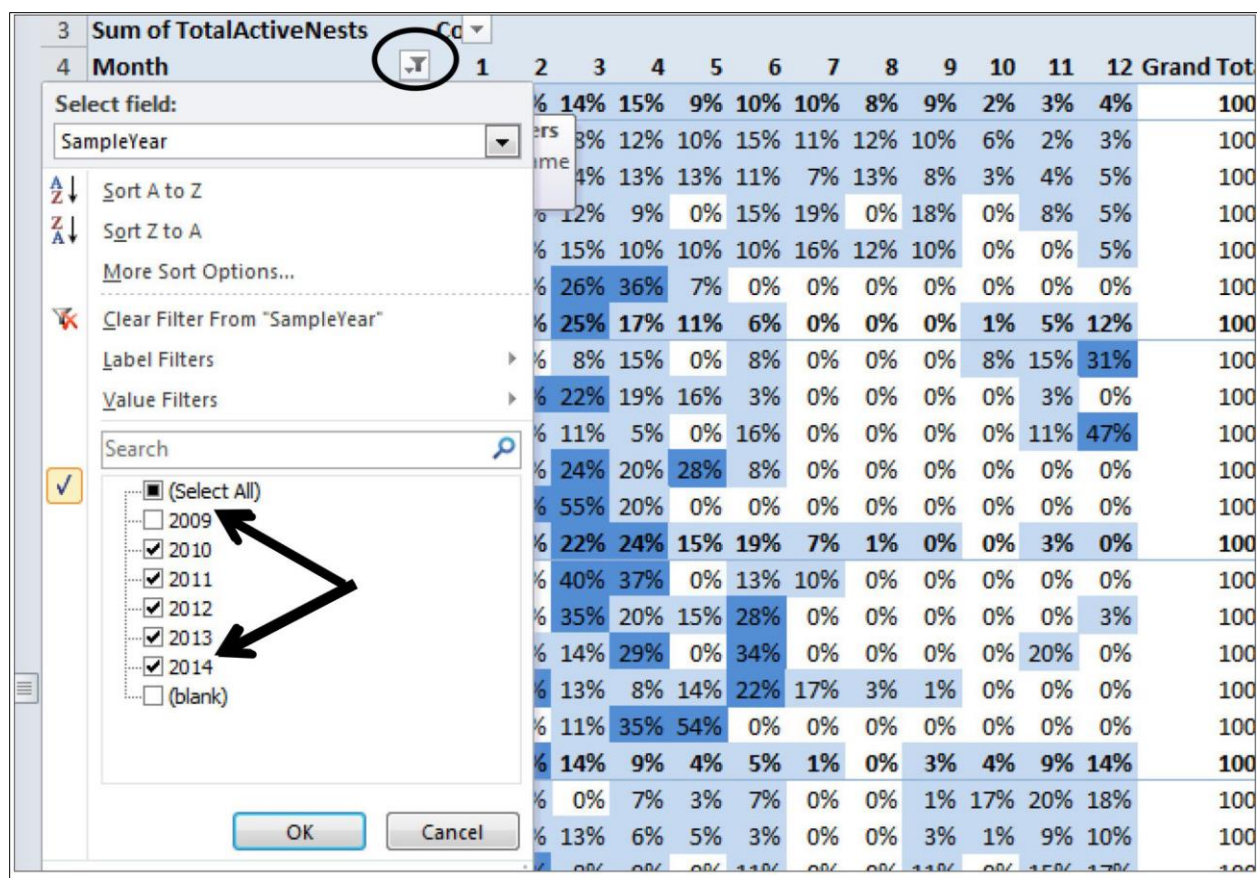


Figure 11. Screenshot showing the filter icon and where to update the years in PctNestingbyMonth_tbl worksheet.

- For the table printout of all the routine and census data (protocol narrative Table A-3), switch to “BigTable_tbl” worksheet in Microsoft Excel. Repeat steps above to replace Table 3. Highlight the whole table. Select “Table Tools” at the top of the screen, then the “Layout” menu, then the “Cell Margins” button (Figure 12). Change the Left and Right Margins to 0.02”. Then Right-Click and under “Table Properties” set “Preferred Width” to 7.5”. This should cause the table to resize to fit on one page. See how to appropriately format tables on multiple pages in the NRDS template guidance. Otherwise reformat the table as desired, e.g. add lines between years, etc. Add “NF” to the year lines to designate months with “No Flight.”

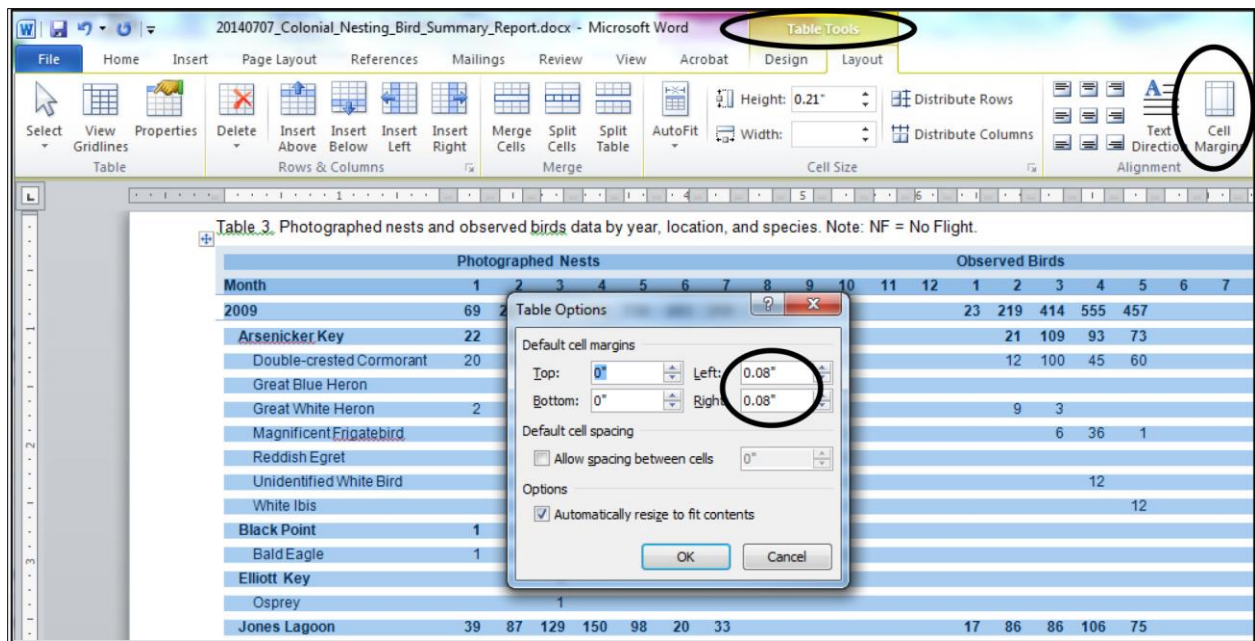


Figure 12. Screenshot showing location of the “Table Tools” menu, the “Cell Margins” button, and where to change the cell margins to help the table fit onto the page.

14. For the graphs showing the number of nests detected each month by species (protocol narrative Figures A-2 to A-4), switch to SpeciesBySamplingPeriod_gr worksheet. To trim the graphs to show only to the end of the calendar year, click on a year in each table and then click on the filter button to select/unselect years as appropriate. Click on the Double-crested Cormorants figure. Right-click and select “Copy”. Switch to the Microsoft Word Document. Delete the old graph. Insert the new graph by right-clicking and selecting “Paste” and then “Picture”. Resize as appropriate. Repeat for other two graphs.
15. For the graph showing the number of colony locations by species (protocol narrative Figure A-5), click on “NumColonies_gr” worksheet. Scroll to right to see the graph. Update the years, species, and locations on the pivot table above the graph if necessary (Figure 13). For example, if brown pelicans are found nesting in the park, this species will need to be selected and added to the table for it to appear in the graph. Likewise, if new colonies are found in the park, their locations will need to be added to the Loc_Name checkoff list. Copy and paste the graph into the Microsoft Word document as a picture as described above in step 13.

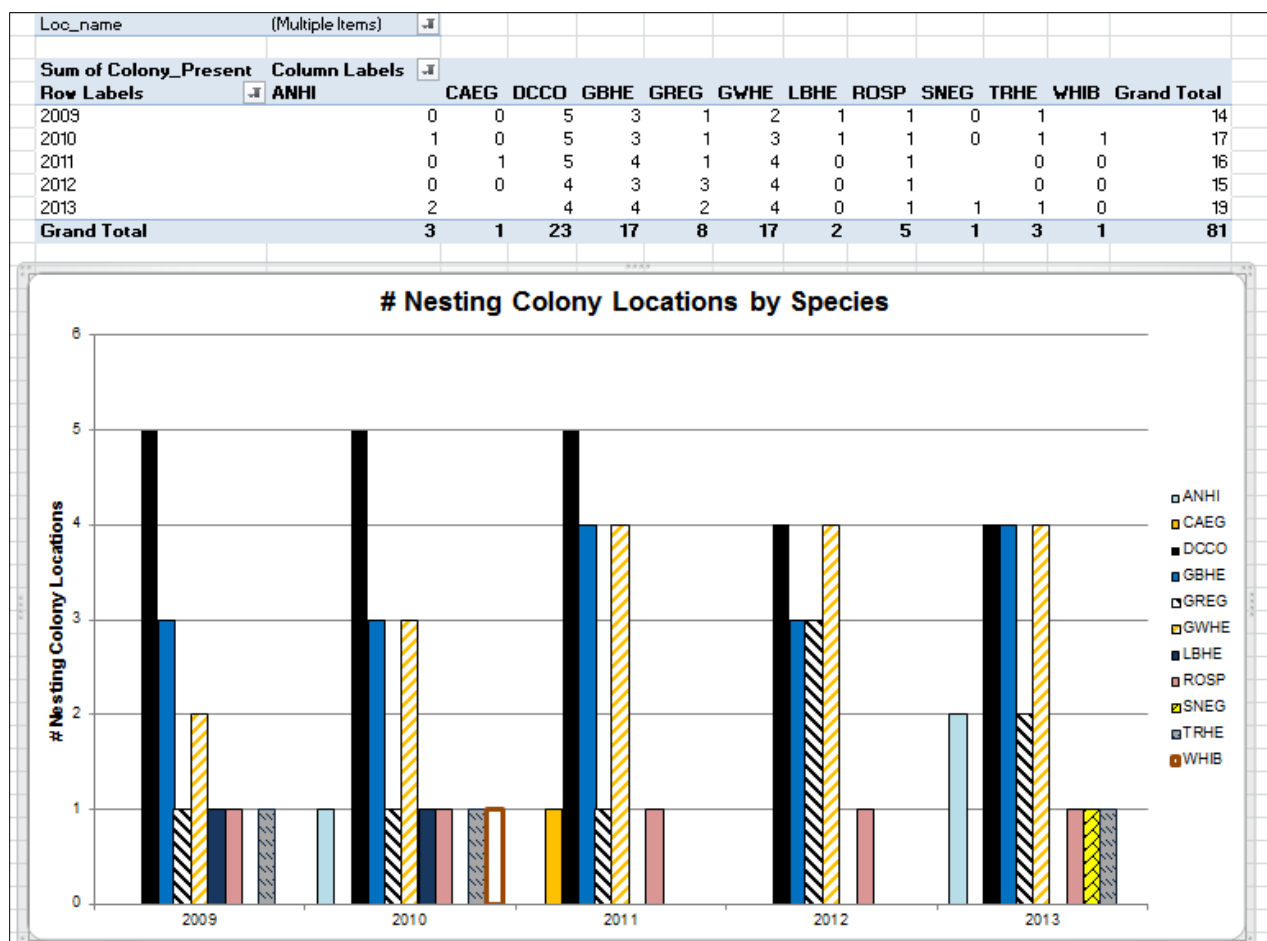


Figure 13. Screenshot showing graph of number of nesting colony locations by species with the pivot table that creates it above. The years should be adjusted in the pivot table. New colony locations should be added under “Loc_Name” and new colonial nesting bird species observed nesting under “Column Labels” as appropriate.

- For the graphs of the number of species detected nesting in each colony (protocol narrative Figure A-6), click on the SpRich_gr worksheet (Figure 14). Scroll to the right to see the graph. Update the table below the figure for years, nesting species codes, and add any new colony locations as appropriate using the various filters. Copy and paste the figure into the Microsoft Word document as a “Picture” as described above in step 13.

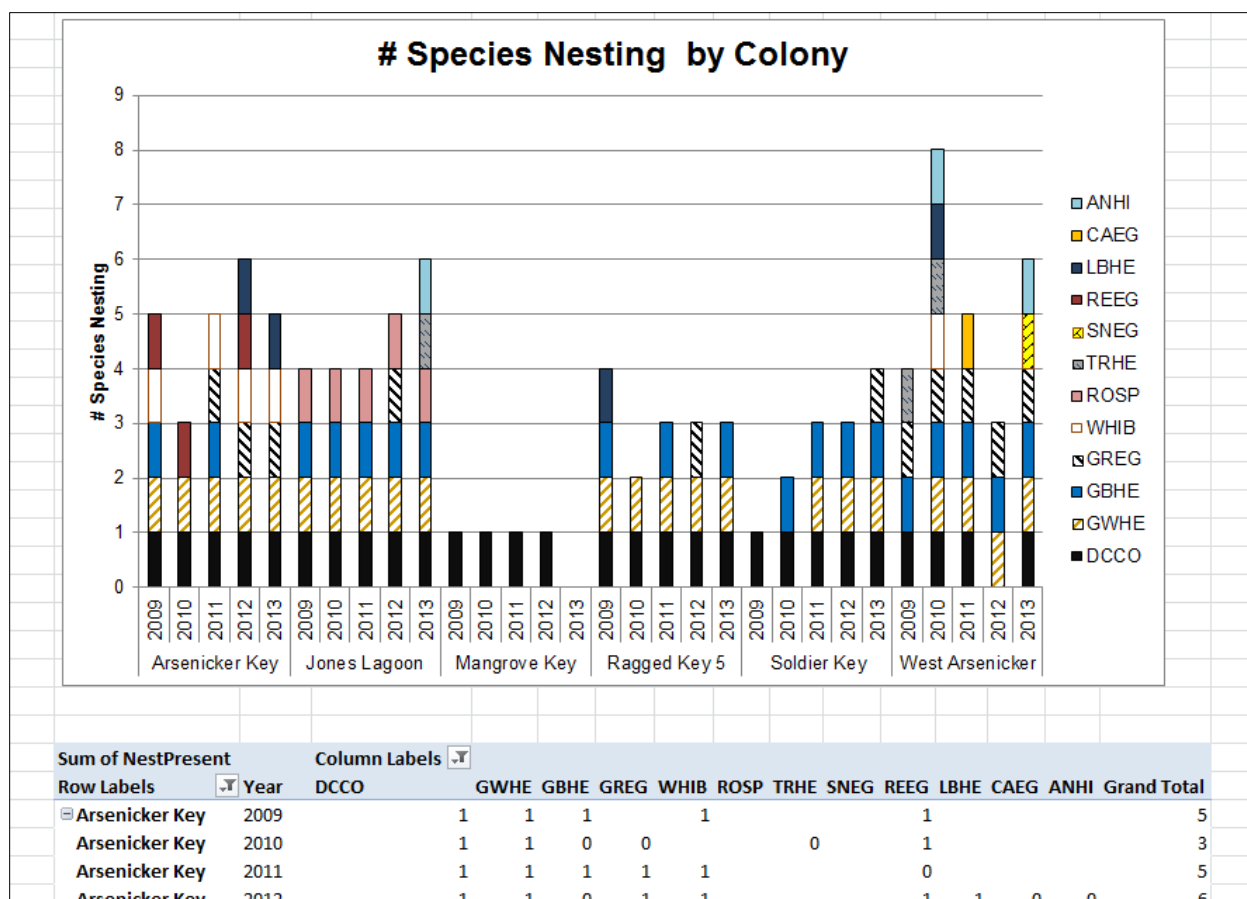


Figure 14. Screenshot showing number of species nesting by colony with related pivot table below from worksheet SpRich_gr. The years should be adjusted in the pivot table. New colony locations should be added by clicking on a location like “Arsenicker Key” and clicking the filter button and new colonial nesting bird species observed nesting by clicking the filter button to the right of “Column Labels”.

17. For the graphs of the total peak nest counts across all colonies (protocol narrative Figure A-7) and then within each colony (protocol narrative Figure A-9), click “PeakNest_gr” worksheet (Figure 15). Scroll to the right and update years on the pivot tables above each of the graphs. Delete the previous graphs but not the legend for Figure 8. Follow steps above for copying and pasting graphs into the report. Resize and arrange the nine colony peak nest count graphs so they fit. If new colonies are located, a new colony specific graph will need to be added to the graphing template.
18. Repeat step 17 for nesting index graphs (protocol narrative Figure A-8 and A-10) using graphs on the “NestingIndex_gr” worksheet.

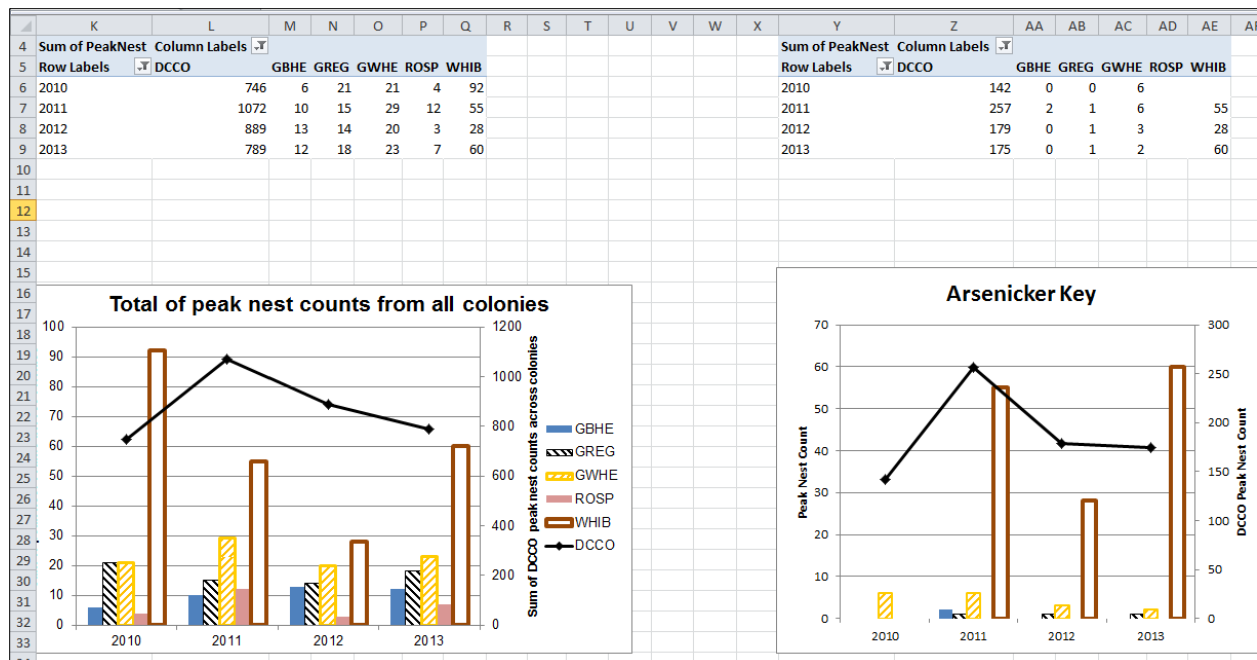


Figure 15. Screenshot showing number peak nesting across all colonies and also for Arsenicker Key from worksheet PeakNest_gr. Years should be updated on these graphs.

19. Make sure the publication meets 508 Compliance requirements. Using the latest NRDS template and following the self-contained instructions will meet most of these requirements. In addition:

- Tables must be in Microsoft Word table format. They cannot be images of a table, or still in MS Excel or SigmaPlot, or set up using "typewriter techniques," e.g., using spaces and tabs on a regular line of text to create "columns."
- Tables cannot be wider than the page margins.
- Images must have alternate text.
- Images, text boxes, etc. must also stay within the existing page margins.

For additional details on adding alternate text or formatting tables, etc., please see the guidance in: Z:\SFCN\IMD_Guidance\Reports\508_Compliance\IM_PDF_Accessibility_Using_MSWord.pdf.

Data Analysis

Presently there is not enough data to determine the natural range of variability that should be expected within Biscayne National Park in numbers of colonies, locations of colonies, peak nests and peak nesting periods. These are expected to vary with annual rainfall, amount and timing of freshwater flows into the bay, and how they in turn affect food availability within and outside the

park. Separating natural background variability from actual trends will be difficult at first and will be approached cautiously and with common sense. Initially data analysis for change will consist of:

- Comparison with baseline maximum and minimum numbers of colonies, peak nesting periods, annual nesting index, and peak nesting months to see if a current year is within the range of the baseline data.
- Determination if new colonies are established or are being abandoned.
- Using a regression analysis to see if a trend is occurring in peak nesting.

An initial baseline range of the maximum and minimum number of colonies, peak nest counts, colony locations, and peak nesting months is given in Table 1. As this is a new program, an initial analysis simply involves looking for obvious changes from the baseline years and then stating as such.

Number of Colonies

1. Any change in the number of colonies for top-canopy nesters is considered a difference as the monitoring completes a census for the park. White ibis (*Eudocimus albus*) is similarly considered a census as it is a highly visible bird even in the sub-canopy, and typically nests in large groups. The simplest approach at this time is to note whether a current year's number of colonies is outside the range seen from previous survey years (period of record) and whether new colonies have developed or colonies have been abandoned as the locations of colonies has been fairly stable through the development phase of this protocol.

Table 1. Example table for initial baseline ranges from 2010–2013 of number of colonies, peak nest counts, and annual nesting index for focal species. New data outside this range may be noted as worth watching for a trend.

Range	Species=	DCCO	GBHE	GREG	GWHE	ROSP	WHIB
Colonies	Colonies nested at least once	All	All except Mangrove Key	All except Mangrove Key	All except Mangrove Key	Jones Lagoon	Arsenicker, West Arsenicker
	Maximum # Colonies	6	5	4	5	1	1
	Minimum # Colonies	5	3	1	4	1	1
Peak Nest Counts	Maximum Peak Nest Count	1072	13	21	29	12	92
	Minimum Peak Nest Count	746	6	14	20	3	28
	Average Annual Peak Nest Count	874	10.3	17	23.3	6.5	58.8
	Std. Deviation	145	3.1	3.2	4.0	4.0	26.2
	Peak Nesting Months	Mar–Sep	Dec–Jun	Nov–Jul	Sep–Apr	Nov–Feb	Apr–Jul
Nesting Index	Maximum Nesting Index	5880	32	81	104	21	150
	Minimum Nesting Index	4309	13	40	76	7	69
	Average Nesting Index	5196	25	56	87	13	110
	Std. Deviation	653	9	18	12	6	37
	Months Any Nesting Detected	All	Oct–Jun	All except Oct	All except Aug	Oct–Apr	Apr–Aug

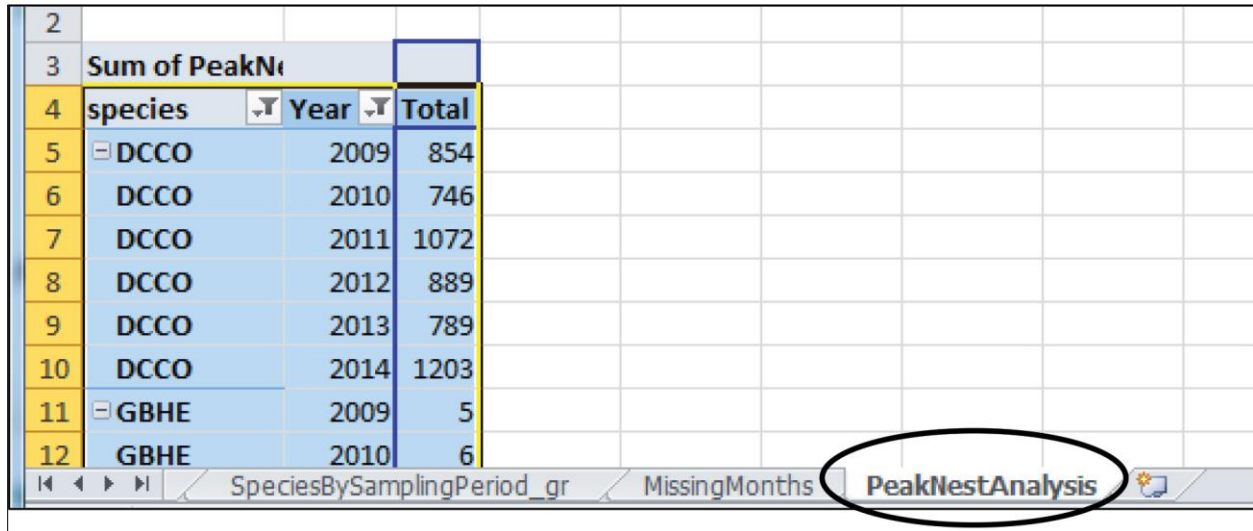
Peak Nesting

- For focal species, trends in peak nesting are determined by colony and then across all colonies to provide a park-wide estimate. Similar to the colony count, peak nest numbers can be compared to the range detected in the period of record prior to the current sample year. In addition, once five or more complete years of data have been gathered, a regression analysis may be used to evaluate trend. For species with small whole numbers (i.e., all species except

cormorants) which may violate the assumption of normally distributed data, a Poisson regression analysis may be used.

- a. To conduct the regression analysis, first copy the table in worksheet PeakNestAnalysis (Figure 16) of the graphing template to a new Microsoft Excel file and save it as Excel 97–2003 Workbook (*.xls):

Z:\SFCN\Vital_Signs\Colonial_Nesting_Birds\data\exports\PeakNest.xls



species	Year	Total
DCCO	2009	854
DCCO	2010	746
DCCO	2011	1072
DCCO	2012	889
DCCO	2013	789
DCCO	2014	1203
GBHE	2009	5
GBHE	2010	6

Figure 16. Screenshot showing worksheet and table to highlight for SAS regression analysis.

- b. Example is given for the SAS statistical Program. From a computer with SAS statistical program loaded double-click the SAS program script (Figure 17):

Z:\SFCN\Vital_Signs\Colonial_Nesting_Birds\analysis\Annual\Scripts\ColonialBirdsRegression.sas

This loads the program below into SAS 9.2.

```

* This program analyzes colonial nesting bird peak nest counts using first a
* Poisson regression (appropriate for most species) and then a regression
* assuming a normal distribution (appropriate for DCCO);

proc import
datafile="Z:\SFCN\Vital_Signs\Colonial_Nesting_Birds\data\BISC\exports\PeakN
est.xls"
out=peaknestdata replace; * reads in data file;
quit;
Data peaknestworking;
    set peaknestdata;
    if year=2009 then delete; * deletes 2009 as an incomplete year;
    if year=2014 then delete; * deletes 2014 as an incomplete year;
run;
Proc sort;
    by species year;
run;
Proc print; * prints out data to allow checking that is read in correctly;
run;
title; footnote; options pageno=1;
*** Poisson Regression Analysis ***;
proc glimmix ;
    Title "poisson distribution";
    by species;
    model Total = Year/ dist=poisson solution;
    Output pred=predglx resid=residglx;
run;
Proc plot; * plots predicted values versus residuals for poisson regression
analysis;
    By species;
    Plot residglx*predglx;
Run;
*** Regression Analysis with Normal Distribution ***;
proc glimmix ;
    Title "normal distribution";
    by species;
    model Total = Year/ dist=normal solution;
    Output pred=predglx2 resid=residglx2;
run;
Proc plot; * plots predicted values versus residuals for normal regression
analysis;
    By species;
    Plot residglx2*predglx2;
Run; quit;

```

Figure 17. SAS program script for conduction Poisson regression analysis and normal parametric - regression analysis.

- c. Then click the submit button (Figure 18).

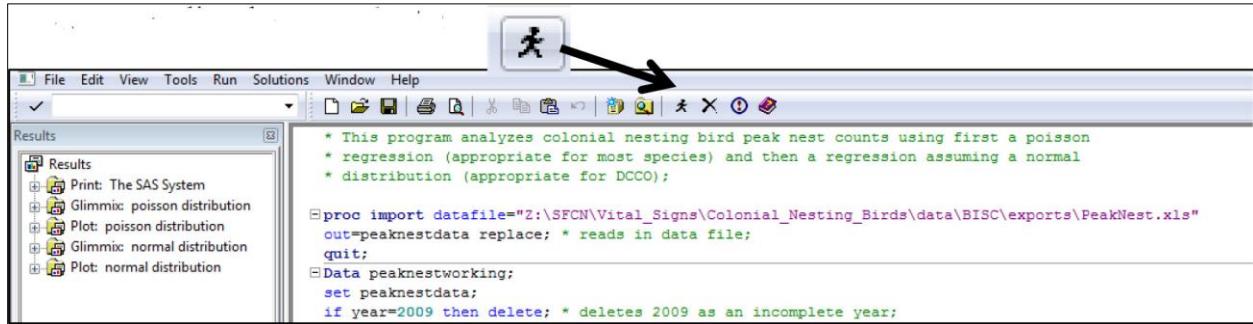


Figure 18. Screenshot showing “submit” button used to run programs.

- d. Click the “Output” window (Figure 19) to see the results and scroll to the top of the output.
- e. Check that the data printed out as expected.

The screenshot shows the 'Output - (Untitled)' window in SAS. The window displays a table of data with the following columns: Obs, species, Year, and Total. The data is sorted by species and year. The table is titled 'normal distribution' and the date/time is '14:04 Tuesday, July 15,'.

Obs	species	Year	Total
1	DCCO	2010	746
2	DCCO	2011	1072
3	DCCO	2012	889
4	DCCO	2013	789
5	GBHE	2010	6
6	GBHE	2011	10
7	GBHE	2012	13
8	GBHE	2013	12
9	GREG	2010	21
10	GREG	2011	15
11	GREG	2012	14
12	GREG	2013	18
13	GWHE	2010	21
14	GWHE	2011	29
15	GWHE	2012	20
16	GWHE	2013	23
17	ROSP	2010	4
18	ROSP	2011	12
19	ROSP	2012	3
20	ROSP	2013	7
21	WHIB	2010	92
22	WHIB	2011	55
23	WHIB	2012	28
24	WHIB	2013	60

The bottom taskbar shows several open windows: Results, Explorer, Output - (Untitled) (which is circled), Log - (Untitled), Editor - Untitled1, and ColonialBirdsRegression...

Figure 19. Screenshot showing “Output” window and initial printout of data that should be checked to make sure results were read into program correctly.

- f. For GBHE, GWHE, GREG, ROSP, WHIB, scroll down to the first analysis and check that the response distribution is Poisson (Figure 20).

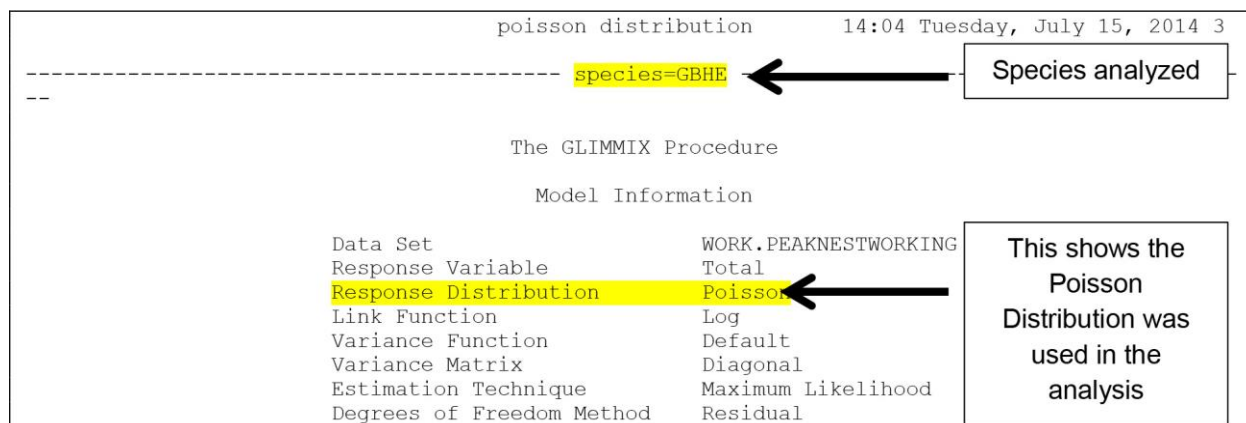


Figure 20. Printout of first part of analysis output where one should check which “Response Distribution” is used: “Poisson” or “Normal”.

g. Then scroll down to the results (Figure 21):

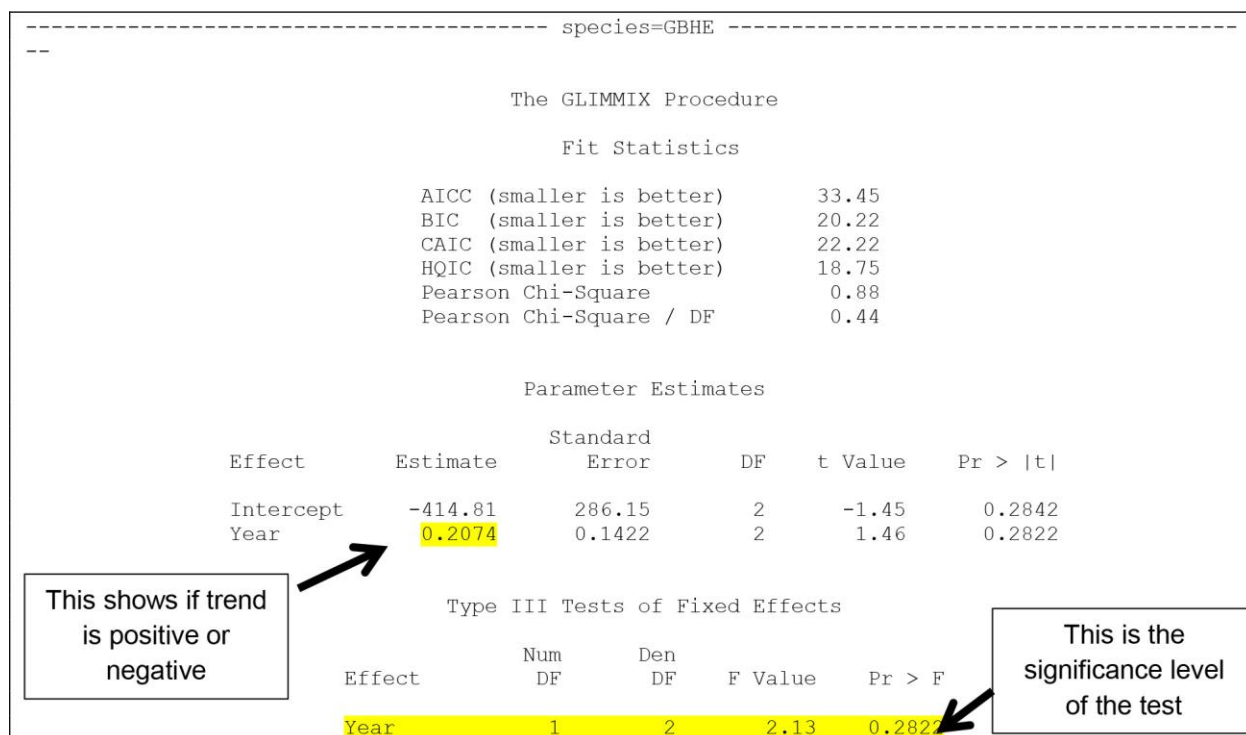


Figure 21. Printout of analysis output showing where one should check for the statistical analysis results and also under the parameter estimates to check if trend is positive or negative.

- A $Pr > F$ value of less 0.05 is generally considered statistically significant although values between 0.05 and 0.10 could be used as a warning to watch for further change in a subsequent year.
- For DCCO, scroll down to the first analysis and check that the response distribution is “Normal”. Then scroll down to look at the results.

- j. Click on the Output window and select “File” and “Save As” and save the file to Z:\SFCN\Vital_Signs\Colonial_Nesting_Birds\analysis\Annual\YYYY\YYYYMMD D_ColonialNestingBirds_PeakNestRegression_2013.lst where YYYY is the last data year for the report and YYYYMMDD is the analysis date.
- k. Early trends should be interpreted cautiously as the true range of natural variability is still unknown, e.g., natural variability due to differences in annual rainfall

Annual Nesting Index

3. The annual nesting index is calculated as the sum of nests counted during all 12 months. The Excel graphing template will automatically interpolate values for 1–2 missing months using the average number of nests counted in the month before and month after the missing month(s). It is important to note that the “annual nesting index” is different from the total number of nests as the same nest may be counted in more than one month. Similar statistical analyses are conducted for “annual nesting index” as for “Peak Nesting” described above.

Timing of Peak Nesting

4. Timing of peak nesting will need a longer baseline before it can be evaluated adequately for change. Initial results show some variability in timing of nesting within some species whereas cormorants nest year-round with possibly multiple peak nesting periods.

If No Trend is Detected Update the Control Limits

5. After implementation of five or more complete years of data collection, a regression analysis will be run. If no trend is detected, the maximum and minimum of the data can be updated to include 2014 as initial “Control Limits”. As more data is collected the range can be replaced with 90% and 95% calculated “Control Limits” (Montgomery 2001) which provide a quick way of evaluating whether a current year of data is outside what is expected given the initial baseline data. This process can be repeated as time moves forward, perhaps every five years.

Periodic Trend Report

The South Florida/Caribbean Network will produce a more in-depth trend report every five years. The network is working with the regional statistician to review the suggested trend analysis presented in this SOP with the desire to have a complete trend report by the end of 2022.

Archiving

Secure data archiving is essential for protecting data from loss. Several different types of archiving are involved with this protocol. The types of data that are archived include:

- Field datasheets
- Photographs
- GPS trackline files

- Databases
- Scanned data sheets
- Exported flat files
- Protocol, graphing template, and analysis scripts
- Data summary reports

Annual archiving for these files starts once the designated project lead has affirmed that the appropriate QA/QC procedures for a nesting season's data are complete and has notified the Network Data Manager that the database is ready for archiving. This should typically occur in September as the target date for the 10% QA/QC check is August.

1. The following are stored in SFCN Colonial Nesting Birds binders in the SFCN conference room segregated by year, month, and island colony in alphabetical order:
 - a. DVDs and/or Blu-ray disks of photographs and GPS data. These are created soon after the flight before the photographs are analyzed.
 - b. Printed photographs, field data sheets, photo processing data sheets, printouts of entered data for QA/QC.
2. The database metadata are updated including any new fields descriptions, table descriptions, query descriptions, or form descriptions. At this point the Network Data Manager uploads a copy of the database to NPS Data Store (<https://irma.nps.gov/DataStore/>) and set to a 'File Access Level' of 'Internal'. Once a survey has a Data Processing Level of Accepted or Certified, all data additions or edits must be documented in an edit log on the server.
3. The export used for the "Data" worksheet in the graphing template is saved as a *.csv file with associated metadata. The metadata file and flat file are stored together in a zip file ColonialBirds_BISC_YYYY.zip. This is a format that can easily be sent in response to data requests. A copy of the zipped flat file is also uploaded to NPS Data Store (<https://irma.nps.gov/DataStore/>) and set to an appropriate 'File Access Level' based on the Biscayne National Park protected data agreement.
4. The scanned datasheets for that year are likewise stored on the server and uploaded to the NPS Data Store. The server storage location is:
Z:\SFCN\Vital_Signs\Colonial_Nesting_Birds\data\BISC\Scanned_data_sheets
5. GPS tracklines are stored on the server:
Z:\SFCN\Vital_Signs\Colonial_Nesting_Birds\spatial_info\BISC
6. Changes or deviations to the protocol will be recorded annually in the Operational Review document and then incorporated into the next round of narrative and SOP edits.

7. Data summary reports are published in the South Florida Wading Bird Report. The South Florida Wading Bird Reports are produced annually and are available at the South Florida Water Management website: <https://www.sfwmd.gov/document/south-florida-wading-bird-report>. A National Data Series Report may also be produced when time and resources permit. The editable NRDS Word documents are stored on the server and 508-compliant PDFs are uploaded to the NPS Data Store and made available to the public.

Backup copies of the SFCN file server are maintained at the South Florida office and at the I&M Central Office in Fort Collins, Colorado.

Literature Cited

Montgomery, D. C. 2001. Introduction to Statistical Quality Control, 4th Edition. John Wiley & Sons, Inc., New York, New York.

Muxo, R., K. R. T. Whelan, R. Urgelles, J. Alonso, J. M. Patterson, and A. J. Atkinson. 2022. Biscayne National Park colonial nesting birds monitoring protocol—Version 1.1. Natural Resource Report NPS/SFCN/NRR—2022/2343. National Park Service, Fort Collins, Colorado. Available at: [DataStore - Published Report - \(Code: 2290141\) \(nps.gov\)](#) (last accessed January 2022).

South Florida/Caribbean Network (SFCN). 2021. GPS track downloading, photo downloading and archiving, photo geotagging, photo renaming, and photo tagging in ThumbsPlus—Version 1.1. South Florida/Caribbean Network Standard Operating Procedure NPS/SFCN/SOP—CNB04. South Florida/Caribbean Network, Palmetto Bay, Florida. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/2285050> (last accessed January 2022).

Appendix A. Database Table and Field Descriptions

Colonial Nesting Birds Database

The database used for this protocol is named SFCN_ColonialBirds.mdb and holds a number of tables that store the tabular data, geospatial data, photo linkages, lookup tables, and metadata tables.

Database Table Descriptions and Field Definitions

Table: geo_Colony_Locations

Table A-1. ArcGIS geodatabase feature class indicating the approximate spatial position of each bird colony.

Field Name	Type	Size	Description
OBJECTID	Number (Long Integer)	4	ESRI feature autonumber
Shape	OLE Object	0	ESRI feature geometry
Loc_Name	Text	50	Name of the bird colony
X_Easting	Text	254	Easting coordinate value in meters (UTM coordinate system)
Y_Northing	Text	254	Northing coordinate value in meters (UTM coordinate system)

Table: tbl_Db_Revisions

Table A-2. Database revision history data.

Field Name	Type	Size	Description
Revision_ID	Text	50	M. Database revision (version) number or code (Rev_ID)
Revision_Contact_ID	Number (Replication ID)	16	MA. Link to tlu_Contacts (Rev_Cnt_ID)
Db_Meta_ID	Number (Replication ID)	16	M. Link to tbl_DB_Meta (Db_Meta_ID)
Revision_Date	Date/Time	8	M. Database revision date (Rev_Date)
Revision_Reason	Memo	0	M. Reason for the database revision (Rev_Reason)
Revision_Desc	Memo	0	M. Revision description (Rev_Desc)

M=Mandatory; O=Optional; MA= Mandatory if applicable. These fields are required by Natural Resource Data Template (NRDT)

Table: *tbl_Event_Group*

Table A-3. Event aggregations. In this case these represent individual flights with flight details.

Field Name	Type	Size	Description
Event_Group_ID	Number (Replication ID)	16	M. An identifier for the event group
Start_Date	Date/Time	8	M. Starting date of the event group; date that the bird colony monitoring flight occurred
Report_Date	Date/Time	8	M. Reporting date of the event group; date that should be used in graphing/reporting
Event_Group_Name	Text	100	O. Event group (e.g. April 2019 flight) name
WeatherConditions	Text	255	MA. general description of weather conditions during the flight
Temperature	Number (Single)	4	MA. average temperature during the flight in degrees Celsius
WindDirection	Text	255	MA. average wind direction during the flight in degrees
WindSpeed	Text	255	MA. average wind speed during the flight in knots
Pilot	Number (Replication ID)	16	MA. name of the person piloting the aircraft
FrontObserver	Number (Replication ID)	16	MA. name of the person observing and taking notes in the front of the aircraft
Photographer	Number (Replication ID)	16	MA. name of the person taking photographs in the back of the aircraft
Aircraft	Text	70	MA. type/model of aircraft used for the monitoring
Park	Text	4	M. Four letter NPS park unit code where flight occurred (or was supposed to have occurred if not flown)
Survey_Method	Text	50	MA. method of survey (helicopter, airplane, boat, or canoe)
Survey_Type	Text	50	M. type of survey (routine, census, or supplemental)
Not_Flown	Yes/No	1	M. yes value indicates that a routine flight was skipped

M=Mandatory; O=Optional; MA= Mandatory if applicable

Table: *tbl_Events***Table A-4.** Details for a sampling event at a single colony including photo processing information.

Field Name	Type	Size	Description
Event_ID	Number (Replication ID)	16	M. Event identifier (Event_ID)
Location_ID	Number (Replication ID)	16	M. Link to tbl_Locations (Loc_ID)
Event_Group_ID	Number (Replication ID)	16	MA. Link to tbl_Event_Group (Ev_Gp_ID)
Protocol_Name	Text	100	M. The name or code of the protocol governing the event (Protcl_Nam)
ProcessingDate	Date/Time	8	MA. date that the photographs were processed
PhotoProcessor	Number (Replication ID)	16	MA. person who processed the photographs
NoNests	Yes/No	1	M. checked (yes) if no nests were observed at a site
EmptyNests	Number (Long Integer)	4	O. number of empty nests seen in the photographs for this site - replaced by individual species level tracking in September 2012; RETIRED
Comments	Text	255	O. comments from the photo processing datasheet
DoubleCheck	Yes/No	1	M. has this data been double-checked (100% verification)?
DoubleCheck_UserID	Number (Replication ID)	16	MA. ID of the person who did the double-check (100% verification)
DataProcessingLevelID	Number	8	M. ID of the Data Processing Level
DataProcessingLevelDate	Date/Time	8	MA. Date the Data Processing Level was last changed
DataProcessingLevel_UserID	Number (Replication ID)	16	MA. ID of the person who last changed the Data Processing Level

M=Mandatory; O=Optional; MA= Mandatory if applicable

Table: tbl_Field_Data

Table A-5. Photograph nest counts and observer bird observations.

Field Name	Type	Size	Description
Data_ID	Number (Replication ID)	16	MA. Field data table row identifier
Event_ID	Number (Replication ID)	16	M. Link to tbl_Events
Data_Location_ID	Number (Replication ID)	16	MA. Optional link to tbl_Data_Locations
SpeciesCode	Text	4	4-letter USGS bird banding code for the bird species observed/nesting
Photo_OccupiedNests	Number (Long Integer)	4	number of occupied nests counted from the photographs for a site
Photo_NestsWithChicks	Number (Long Integer)	4	number of nests with chicks counted from the photographs for a site
Photo_NestsWithEggs	Number (Long Integer)	4	number of nests with eggs counted from the photographs for a site
Photo_EmptyNests	Number (Long Integer)	4	number of empty nests counted from the photographs for a site
Observed_Birds	Number (Long Integer)	4	number of birds observed from the helicopter (estimate)
Observed_ActiveNests	Number (Long Integer)	4	number of active nests observed from the helicopter (estimate)

M=Mandatory; O=Optional; MA= Mandatory if applicable

Table: *tbl_Locations*

Table A-6. Location of bird colonies.

Field Name	Type	Size	Description
Location_ID	Number (Replication ID)	16	M. Location identifier
GIS_Location_ID	Text	50	MA. Link to GIS feature, equivalent to NPS_Location_ID
Meta_MID	Text	50	MA. Link to NR-GIS Metadata Database
Loc_Name	Text	100	M. Name of the location
Loc_Short_Name	Text	10	M. Abbreviated name for location
X_Coord	Number (Double)	8	M. X coordinate (X_Coord) in UTM Zone 17 meters (NAD83)
Y_Coord	Number (Double)	8	M. Y coordinate (Y_Coord) in UTM Zone 17 meters (NAD83)
Latitude	Number (Single)	8	M. Latitude in decimal degrees (NAD83)
Longitude	Number (Single)	8	M. Longitude in decimal degrees (NAD83)
Unit_Code	Text	12	M. Park, Monument or Network code (Unit_Code)
Loc_Type	Text	25	MA. Location type category (Loc_Type)
Updated_Date	Date/Time	8	MA. Date of entry or last change (Upd_Date)
Loc_Notes	Memo	0	MA. General notes on the location (Loc_Notes)
SortIndex	Number (Long Integer)	4	M. order of sorting for these locations
ReportLocation	Yes/No	1	M. show this location on reports?

M=Mandatory; O=Optional; MA= Mandatory if applicable

Table: *tlu_Birds*

Table A-7. Lookup table of birds that might be observed during this project.

Field Name	Type	Size	Description
BirdID	Number (Long Integer)	4	M. bird code identifier number
SpeciesCode	Text	4	M. four letter shorthand code
CommonName	Text	255	MA. common name or code for unidentified birds
ScientificName	Text	255	MA. scientific name
Family	Text	255	MA. scientific family
Order	Text	255	MA. scientific order
SortIndex	Number (Long Integer)	4	M. preferred sort order of the bird species
ReportBird	Yes/No	1	M. show this bird species on reports?
FullSpecies	Yes/No	1	M. is this code a full species (e.g. UNWH – unidentified white bird) is not a species level code)

Table: *tlu_Enumerations*

Table A-8. Enumerated lookup table.

Field Name	Type	Size	Description
Enum_Code	Text	50	M. Code for lookup values (Enum_Code)
Enum_Description	Memo	0	M. Lookup value description (Enum_Desc)
Enum_Group	Text	50	M. Category for lookup value (Enum_Group)
Sort_Order	Number (Integer)	2	O. Order in which to sort lookup values (Sort_Order)

M=Mandatory; O=Optional; MA= Mandatory if applicable

Table: tlu_Months**Table A-9.** Enumerated lookup table.

Field Name	Type	Size	Description
Enum_Code	Number (Long Integer)	4	M. Code for lookup values (Enu)
Enum_Description	Memo	0	M. Lookup value description (Enum_Desc)
Enum_Group	Text	50	M. Category for lookup value (Enum_Group)
Sort_Order	Number (Integer)	2	O. Order in which to sort lookup values (Sort_Order)
Month	Text	2	M. Month as a two digit text field for reporting

M=Mandatory; O=Optional; MA= Mandatory if applicable

Table: tlu_DataProcessingLevels**Table A-10.** Table of possible data processing levels.

Field Name	Type	Size	Description
ID	Number (Long Integer)	8	M. Unique primary key identifier
Code	Short Text	2	M. Unique alpha code for each lookup value
Label	Short Text	20	M. Unique name of each lookup value
Summary	Long Text	N/A	M. DPL definition
IsActive	Yes/No	2	M. Indicates whether the data processing level is appropriate for the given application/protocol
ProcessOrder	Number	4	M. Used to enforce the forward progress of data processing levels and prevent moving backwards

M=Mandatory; O=Optional; MA= Mandatory if applicable

Table: tlu_Contacts**Table A-11.** Contact data for project-related personnel.

Field Name	Type	Size	Description
Contact_ID	Number (Replication ID)	16	M. Contact identifier
Full_Name	Text	255	M. Full name
Last_Name	Text	50	M. Last name
First_Name	Text	50	M. First name
Middle_Init	Text	4	M. Middle initial
Organization	Text	50	M. Organization or employer
Position_Title	Memo	0	M. Title or position description
Address_Type	Text	50	M. Address (mailing, physical, both) type
Address	Text	50	M. Street address
Address2	Text	50	MA. Address line 2, suite, apartment number
City	Text	50	M. City or town
State_Code	Text	8	M. State or province
Email_Address	Text	50	MA. Email address
Work_Phone	Text	50	MA. Phone number
Contact_Notes	Memo	N/A	MA. Contact notes
IsActive	Yes/No	1	M. Flag indicating if the person is still active with this protocol
Data_Entry	Yes/No	1	M. Does this person do data entry?

M=Mandatory; O=Optional; MA= Mandatory if applicable

Table: Userfields**Table A-12.** ThumbsPlus 7.0 generated database table for linking photo into database.

Field Name	Type	Size	Description
idThumbUDF	Number (Long Integer)	4	Unique ID
uf_FlightDate	Date/Time	8	Flight Date
uf_SiteName	Text	25	Colony site name
uf_SurveyType	Text	25	type of survey (routine or census)

Table: Path**Table A-13.** ThumbsPlus 7.0 generated database table for linking photo into database.

Field Name	Type	Size	Description
idPath	Number (Long Integer)	4	Path ID
idVol	Number (Long Integer)	4	Volume id of path
pathtype	Number (Long Integer)	4	Type of path (invalid, dir, zip)
name	Text	255	Path

Table: Volume**Table A-14.** ThumbsPlus 7.0 generated database table with details of the photo filing.

Field Name	Type	Size	Description
idVol	Number (Long Integer)	4	Volume ID
vtype	Number (Long Integer)	4	Volume type
serialno	Number (Long Integer)	4	Volume serial number
maxcomplen	Number (Long Integer)	4	Maximum component length
vchar	Number (Long Integer)	4	Volume characteristics
filesystem	Text	32	Filesystem type
label	Text	64	Volume label
netname	Text	255	Network connection name
alias	Text	80	Volume alias

Table: Thumbnail**Table A-15.** ThumbsPlus 7.0 generated database table with details of the photo.

Field Name	Type	Size	Description
idThumb	Number (Long Integer)	4	Thumbnail ID
idPath	Number (Long Integer)	4	Path ID for file
idFiletype	Number (Long Integer)	4	File type
file_time	Number (Long Integer)	4	Date file was last written
thumbnail_time	Number (Long Integer)	4	Time thumbnail was made
filesize	Number (Long Integer)	4	File size (bytes)
checksum	Number (Long Integer)	4	Thumbnail checksum
width	Number (Long Integer)	4	Image width
height	Number (Long Integer)	4	Image height
horiz_res	Number (Long Integer)	4	Horizontal resolution (PPM)
vert_res	Number (Long Integer)	4	Vertical resolution (PPM)
colortype	Number (Integer)	2	Color type (encoded)
colordepth	Number (Integer)	2	Color depth (bits per pixel)
gamma	Number (Integer)	2	Assumed Gamma (*10)
thumbnail_width	Number (Integer)	2	Thumbnail width
thumbnail_height	Number (Integer)	2	Thumbnail height
thumbnail_type	Number (Long Integer)	4	Thumbnail type
thumbnail_size	Number (Long Integer)	4	Size of thumbnail (bytes)
name	Text	255	File name
thumbnail	OLE Object	0	Embedded thumbnail photograph
annotation	Memo	0	Memo field
metric1	Binary	255	Thumbsplus field
metric2	Binary	255	Thumbsplus field
metric3	Binary	255	Thumbsplus field