

The PASSER Project – Feeder Data Analysis

DHT Spreadsheet File

- There will be a total of nine columns of data, as shown in the figure below.
 - The first three columns (temperature, humidity, and timestamp) are collected by the feeder microprocessor and automatically loaded into the Excel file.
 - The remaining columns should be completed during data analysis.

Temp	Humidity	TimeStamp	Date	Time	Species	Sex	# of Photos	1st Occupant	2nd Occupant	3rd Occupant	Notes
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Photo Files

- Each time the feeder is activated, a set of ~10 photos are taken. These are in a folder called *images*. Each set of photos have a corresponding row in the “DHT” file. Even if the dates are incorrect, they are in the order they were taken (assuming that your file explorer is open and sorted by name).
- NOTE: You may see a slight difference in the time appearing in the “image” name, and the corresponding row of DHT data. (DHT time will be lag behind image time by about 10 seconds). This is OK! Keep track of where you are when working through the data, and photos and data rows show align perfectly!
- If an entire set of photos (folder of 10 photos) is of a person -- or is completely dark (at night) -- delete the photo file, and the corresponding row of DHT data in your Excel spreadsheet for that file folder. Do this as you are working through photos and entering data into the Excel file. (Photos with people usually mean someone is verifying the camera time or other parameters.) Please double-check that the time shown in the photo corresponds correctly with the time row in the spreadsheet.
- If you see more than two sets of blank photos (no bird in photo), delete these files in “images” and in the corresponding row of data in your DHT spreadsheet.
- Sometimes the motion sensor errors, causing the camera to take pictures every 10/15 seconds, which are mostly absent of birds, or are entirely dark. This may last for hours, so you should notice it quickly.
 - If fewer than 400 empty photo files were taken in rapid succession, look through them all and code any birds you find. If more than 400 empty photo files were taken in rapid succession, you may delete these image files and Excel spreadsheet rows.
 - **DO NOT confuse sensor errors with a few sets of blank photos!** We need to know when the camera triggered correctly but did not capture birds. **If you see a handful of blank photos, enter “NONE”** in the spreadsheet column for species. These records are important, allowing researchers to correlate with field observations to see if some birds are simply too fast for the camera to catch them.
 - In summary: If the photo is entirely dark → delete. If human present → delete. If more than 400 sets of photos taken every 10 seconds → delete. *If there are just a few blank photos -- or birds are present → Log the data in the DHT Excel sheet!*

Collecting Data

- After Temp, Humidity, and Time Stamp, all remaining data columns must be entered by hand. (*Tip: You can save time by having images on half of your screen and your DHT spreadsheet on the other half of the screen*)
- **Species** = Identify the bird and enter the 4-letter species code in the “species column”. (*See species codes below*).
- **Sex** = If you are able to ID the bird sex, place M or F in the sex column. NOTE: Not all birds can be sexed visually. **Note sex for: bluebird, house sparrow, house finch, northern cardinal, American goldfinch, downy woodpecker**
- **# of photos** = Enter the # of consecutive photos with the bird present (within the folder of 10 photos). Thus, you will enter a number between 1 and 10. This allows research on how long the bird remained at the feeder.
- **Displacement** = Only use this if displacement occurs (two or more birds in a set of photos, with less than three blank photos between). For **1st Occupant**, place the bird you see first in the photo set, For **2nd Occupant**, place

the bird you see second in the photo set, and so on. If there are 3 or more blank photos between the first bird and the second bird, this is not a displacement, void these three boxes.

- For files that contain 2 birds, but have 3 or more photos between the first and second bird, check the timestamp of the next file of photos and the type of bird in that file.
 - If the next file is within ~15 sec of the original file with 2 or more birds, and the bird in the next file is the same species and sex as the earlier bird, enter the first species in the Excel sheet as usual. Then, add a note that 2 birds were present and proceed as usual (no entry for second bird)
 - If the next file is more than ~15 sec after the original file with 2 birds OR the bird in the next file is not the same as the original, add a row to the Excel sheet immediately below the original row. Copy and paste all of the data taken by the feeder (Temp, Humidity, Timestamp, Date, Time) into that row. Then, code the species, sex, and # of photos for the SECOND bird in the new row.
- **Notes** = any other observations (anything peculiar – including raining, snowing, sharknado, more than one bird present, cool photos great for presentations, etc.)

Fig. 2. Sample “coded” data:

Temperature	Humidity	TimeStamp	Date	Time	Species	Sex	# of Photos	1st Occupant	2nd Occupant	3rd Occupant	Notes
3	46	41:55.0	1/3/2018	12:41:55	none						
3	47	52:22.9	1/3/2018	12:52:23	NOCA	M	10				
4	39	56:17.9	1/3/2018	12:56:18	NOCA	M	10				
3	41	57:20.0	1/3/2018	12:57:20	NOCA	M	10				
3	40	58:37.3	1/3/2018	12:58:37	NOCA	M	10				
4	38	00:55.5	1/3/2018	13:00:55	none						
4	38	03:29.4	1/3/2018	13:03:29	BCCH		10				
4	39	17:11.0	1/3/2018	13:17:11	ETTI		3	ETTI	NOCA		ETTI 3, NO
2	45	18:45.1	1/3/2018	13:18:45	NOCA	M	10				
2	45	18:56.4	1/3/2018	13:18:56	none						
2	45	22:44.8	1/3/2018	13:22:45	ETTI		10				

Fig. 3. Standardized 4-letter species codes for common feeder species in Virginia:

Common name	Species code	Frequency	Previously seen?
American goldfinch	AMGO	Uncommon	Yes
Black-capped chickadee	BCCH	Common	Yes
Blue Jay	BLJA	Uncommon	Yes
Carolina chickadee	CACH	Uncommon	
Carolina wren	CAWR	Uncommon	Yes
Chipping sparrow	CHSP	Very uncommon	
Dark-eyed junco	DEJU	Uncommon	
Downy woodpecker	DOWO	Uncommon	Yes
Eastern bluebird	EABL	Very uncommon	
Eastern tufted titmouse	ETTI	Common	Yes
European starling	EUST	Uncommon	
Gray catbird	GRCA	Uncommon	
House finch	HOFI	Very uncommon	Yes
House sparrow	HOSP	Uncommon	Yes
House wren	HOWR	Uncommon	
Mourning dove	MODO	Very uncommon	Yes
Northern cardinal	NOCA	Common	Yes
Northern mockingbird	NOMO	Uncommon	
Song sparrow	SOSP	Common	Yes
Tree swallow	TRES	Very uncommon	
White-throated sparrow	WTSP	Very uncommon	