

## USGS Data Exploration Unit: Bald Eagle Activity 1 Excel Directions

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Follow the directions given for each section below. A  indicates places where there are questions to answer in your workbooks for Bald Eagle Activity 1.

### Section A: Compiling and sorting your data

**WARNING!!!!!! Follow instructions for sorting very carefully. If you sort the column using the A to Z button on the tool bar your data will get all mixed up and your final results and graph will make no sense.**

#### I. Sort by Species

1. Click on the first cell “B2” under COMMON\_NAME. Click the A to Z button on the toolbar.
2. The records in your spreadsheet are now in alphabetical order by common name. At first glance, all the records should show “Bald Eagle” in the COMMON\_NAME column. Scroll down through all the records and check for different common names.

-  3. Are there any records for species other than the bald eagle?  
Should we keep these records in our analysis? Why or why not?  
What kind of bias would be introduced into our investigation if we included records for different species?  
Think about these questions and record your answers in your workbook.
4. Delete the records for Red-Tailed Hawk. Do this by clicking while holding down your mouse key on the row numbers for the 2 Red-Tailed Hawk records so that those records are highlighted. Go to “Edit” on the menu bar and select “Delete”. Note: you cannot delete by using the delete button on your keyboard because this will only delete the information in the cells but not the rows. Thus you will get blank rows in the middle of your data if you delete using the keyboard.

#### II. Sort by Units

1. Follow the same directions given above for sorting by species but enter UNITS for the column to be sorted.
-  2. What are the different types of units used? Can we compare records with different units? Why? What kind of bias would be introduced into our investigation if we included records with different units?  
Think about these questions and record your answers in your workbook.
3. Delete all records that do not have “ug/g ww” for units.

#### III. Sort by Matrix

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1. Follow the same directions given for sorting by species but enter MATRIX for the column to be sorted.

➡ 2. Are there any records that do not have “egg content” as the matrix? (Be sure to look both above and below egg content) Can we keep these records? Why? What kind of bias would be introduced into our investigation if we included records for different matrices?

Think about these questions and record your answers in your workbook.

3. Delete all records that do not have “egg content” as the matrix.

### IV. Save and copy your file

Your data file is now compiled and sorted. It only contains data you intend to use for your investigation. Save a copy of this dataset to use for later activities before continuing with the next steps. Call this copy, “BaldEagleSort” and close it. Make a copy of BaldEagleSort and name this copy BaldEagle1. Work with “BaldEagle1” for the rest of this activity.

### **Section B: Organizing your data**

Now that we have checked and are satisfied with our data, we need to organize the data for analysis. We need to divide the data into groups by year.

1. Sort data first by “YEAR\_FROM” and second by “YEAR\_TO”. Once again, follow the directions given earlier for sorting by species.
2. Divide the data into the year groups by inserting 3 rows in between each group listed below.

For example, for the first group do this by highlighting 3 rows under the last entry with a “year to” date of 1974. Rows 11, 12 and 13 should be highlighted. With the rows highlighted go to “Insert” on the menu bar and select “Rows”. Three blank rows should appear that separate years 1969-1974 from 1975. Follow this same process for each of the 10 year groups listed below.

- |              |               |
|--------------|---------------|
| 1. 1969-1974 | 6. 1984-1986  |
| 2. 1975-1977 | 7. 1989-1991  |
| 3. 1978-1979 | 8. 1992-1993  |
| 4. 1980-1981 | 9. 1994-1996  |
| 5. 1982-1983 | 10. 1997-2000 |

### **Section C: Calculating DDE averages**

- ➡ 1. Title the column needed for average calculations. On the first row of column “K”, type “N\*DDE”.

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What does the number under the column, “DDE” represent? Answer this question in your workbooks.

- ➔ 2. Make a formula in Excel to multiply “N” by “DDE” for each record. Why do we need to multiply “N” by “DDE” for each record in order to calculate average DDE for each year group? Answer this question in your workbooks.
- Click on the cell below the title “N\*DDE” in column K, cell K2.
  - Type “=H2\*I2” in this cell and hit enter. In Excel an “=” sign is used to indicate a formula. We are telling Excel to multiply the number in cell H2 by the number in I2 which will give us the value for N\*DDE.
  - The number 23.71999931 should appear. This number has way too many decimal points column letter, “K” to highlight the entire column. Go to “Format” on the menu and select “Cells”.
  - In the “Format Cells” box that pops up select “Number” for Category: and use the arrows to select “1” for Decimal places. Click ok. This will make sure that the numbers we see in this column only have one decimal place.
  - The number 23.7 should now appear in cell K2. Verify that this is equal to H2 \* I2 or, in other words, 2 \* 11.9.
  - Using your mouse, highlight cells K2-K10. You are highlighting K cells for all of the records in year group 1. On your keyboard, hold down the “Ctrl” key and press the letter “d”. This will copy the formula we typed in K2 down to the cells we highlighted. Look at the numbers in column K and verify that they are N\*DDE for each record.
  - Repeat this step for the records in the remaining year groups. Every record should now have an entry in column K that is equal to N\*DDE for that record. There should still be 3 blank rows separating each year group from other year groups.

**Note:** The cell numbers used to create a formula in Excel are not interpreted by Excel to be absolute but relative. For example, Excel does not copy the result of H2\*I2 (23.7) of our formula “=H2\*I2” but instead copies the formula itself which it reads as “multiply the number in the cell 3 cells to the left of this cell by the number in the cell 2 cells to the left of this cell.”

3. Sum N and DDE for each group.
- In the first year group, highlight the cells H2-H11. This should highlight the “N” values of all of the records in year group 1 in addition to one extra empty cell in the blank row right under the last record in that year group.
  - With the cells highlighted, Click on the  $\Sigma$  symbol on the menu bar. This symbol averages “sum”. You should see the sum of all N’s for that year group (10) appear in the blank cell. Verify that the sum of all N’s for year group 1 is equal to 10.
  - Follow the same steps to get a sum for the N\*DDE values for year group 1. Select cells K2-K11 and click on  $\Sigma$ . The number 175.1 should appear in the blank cell in column K below the last record in year group 1.
  - Repeat steps #a-c for each of the remaining year groups.

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4. Calculate average DDE for each year group
  - a. First type a title in the first row of column L, “DDEyrgrp” to stand for DDE average for year group.
  - b. Click on cell L11, this cell should be on the same row as the sum N and sum N\*DDE values for year group 1.
  - c. Based on the definition of group average we reviewed with the osprey example and the formula we typed for section C 2b above, type a formula to calculate average DDE for year group 1. If your formula is correct you should get a average value of 17.50599985.
  - d. Using the Format menu, change the format of all cells in column L so that a number with only one decimal point is displayed as we did earlier in section C 2c-d.
  - e. Copy your formula to determine average DDE for the other year groups.
- ➔ 5. Print out your datasheet  
You are now done organizing your data and calculating your DDE averages for each year group. Print out your datasheet before continuing.

### Section D: Graphing your results

In Excel, make a graph of DDE averages by year group

- ➔ 1. In the table provided in your workbooks, write down the average DDE concentrations you calculated for each year group. Also write down the value for N you calculated for each year group and the states represented in the sample for each year group.
2. In Excel, go to “Insert” on the menu bar and select “Worksheet”. A new blank worksheet should appear with the default name of Sheet1.
3. Type “YRGRP” in cell A1 and “DDE” in cell B1.
4. Under “YRGRP” in column A, type the year range for each year group. Starting with group 1, type “1969-1974” in cell A2 and end by typing, “1997-2000” in cell A11.
5. Under “DDE” in column B, type the average DDE concentration you calculated for that year group.
6. Click on the bar graph icon on the menu bar. A “Chart Wizard” box up box will appear. Select “Area” as the Chart type and chose the left top icon as the Chart sub-type. (The description for this sub-type should read, “Area. Displays the trend of values over time or categories”.) Click “Next”.
7. In the “Data Range” box, make sure your cursor is positioned in the Data range entry box. Then click on Sheet1 and highlight cells A2-B11. All year groups with their DDE average concentrations should be highlighted. You will see a little graph appear in the “Data Range” box with years on the X-axis. Click “Next”.

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8. For Chart title, type “Average DDE concentrations in Bald Eagle eggs collected in the United States from 1969 to 2000”. For Category (X) axis, type “Year” and for Value (Y) axis, type “DDE ug/g ww”.
9. Click on “Legend” at the top of the “Chart Wizard”. Uncheck (deselect) Show legend. The “series 1” box will disappear from the picture of your graph.
10. Click on “Data Labels”, select “Show value”. The values for each data point will appear on your graph. Click “Next” at the bottom of the “Chart Wizard”.
11. Place chart, As a new sheet and click on “Finish”. Your graph will appear in a new sheet called Chart1.
12. You can now click on different parts of your chart with your mouse and change the colors, font and other aspects of the chart’s style. You can also click on the point values and reposition them so each value is clearly readable.
- ➡ 13. After you get the graph to look the way you want, print it out. You will hand your graph in with your workbook.

**\*\*\* Be sure to hold on these directions. You may need to refer to them to complete the next activity.**