STUDENT PAGES
Instructions for Analyzing Data in Excel File

You will be given an excel file that contains 6 different tables with data. In this document, you will be provided instructions for analyzing these data.

Remember that one goal of these analyses is to evaluate whether or not gray wolves in the Northern Rocky Mountains have met delisting criteria. To do this, we should take another look at the Delisting Criteria for gray wolves in the Northern Rocky Mountains.

DELISTING CRITERIA: This wolf population must contain at least 300 wolves and 30 breeding pairs and must be equitably distributed in Montana, Wyoming and Idaho for at least 3 consecutive years.

Ready? Let's get started.

Instructions for Analyzing Data in the Excel File

Open your excel file entitled "Excel Datasets_Wolves". This excel file includes 6 datasets. Each dataset is formatted as a table that includes real-world data on the gray wolf population in the Northern Rocky Mountains. Wolf biologists collected these data to evaluate and monitor things like population trend, number of breeding pairs, and geographic distribution of the gray wolf population in the Northern Rocky Mountains.

Each Table has a title, a description of column labels (located at the bottom of each table), and instructions for analyzing the data, located in the BLUE BOX to the right of the table within the excel file. Because it might be difficult to read the instructions in the excel file while also doing what the instructions tell you to do, we have also provided all instructions in BLUE BOXES here in these Student Pages.

After you have completed your analyses, answer questions in the pages called, "Student Pages: Questions about Excel Datasets". Make one copy of your answers for yourself and turn one copy into to your teacher.

STEP 1: Minimum Year-End Population by State
Start with Dataset 1, called "Table 1_Pop by States". This dataset shows the "Minimum Year-End Population" estimate for wolves for each year 1982-2014 for the states Montana, Wyoming, Idaho, Oregon, and Washington.

In this table, you will see that some cells are highlighted in yellow. All cells highlighted in yellow require you to do a calculation to fill in the cells.

Follow the instructions for analyzing data in Table 1:

1) Fill in the missing values for the Total "Minimum Year End Population" Estimate for MT, WY, and ID Combined (i.e., fill in the yellow-shaded cells in column F)

2) Make a line graph showing Year on the x-axis. On the y-axis include 6 lines:
Line 1: Minimum Year-End Population Estimate for MT
Line 2: Minimum Year-End Population Estimate for ID
Line 3: Minimum Year-End Population Estimate for WY
Line 4: Minimum Year-End Population Estimate for OR
Line 5: Minimum Year-End Population Estimate for WA
Line 6: Minimum Year-End Population Estimate for MT, ID, WY Combined

Name this graph:
 Fig. 1. Minimum Year-End Population Estimates for Wolves in MT, WY, ID, OR, WA and 3 States Combined, Years 1982-2014

STEP 2: Breeding Pairs by State
Move on to Dataset 2, called "Table 2_Breeding Pairs by State". This table shows the minimum number of breeding pairs in each of the states: Montana, Wyoming, Idaho, Oregon, and Washington.

Follow the instructions for analyzing data in Table 2:

1) Fill in the missing values for the Minimum # of Breeding Pairs in MT, WY, and ID Combined (i.e., fill in the yellow-shaded cells in column F)
2) Make a bar graph with Year on the x-axis. On the y-axis include 4 bars:
Line 1: # of Breeding Pairs in MT
Line 2: # of Breeding Pairs in ID
Line 3: # of Breeding Pairs in WY
Line 4: # of Breeding Pairs in MT, ID, and WY Combined

Name this graph:
Fig. 2. Minimum Number of Breeding Pairs of Gray Wolves for MT, ID, WY, and all 3 States Combined 1982-2014

STEP 3: Wolf Depredations and Number of Wolves Killed for Control

Now open Dataset 3, called "Table 3_Wolf Depredations". This table includes information on the number of cattle, sheep, dogs, and "other" animals that were confirmed to be killed by wolves in Montana, Idaho, and Wyoming during years 1987-2014. This table also includes the number of wolves that were lethally removed by wildlife professionals for control, to reduce livestock-wolf conflicts.

Follow the instructions for analyzing data in Table 3:

1) Fill in the missing values for the "3 States Combined" section, i.e. fill in yellow shaded cells in columns P, Q, and R (i.e., HINT: How many cattle were depredated by wolves for all 3 states combined each year?)

2) Sum the total "Cattle" Depredated by wolves for all 3 States Combined for all years (i.e., fill in cell P35).
Do the same for "Sheep" (cell Q35), "Other" (cell R35) and "Dogs" (cell S35).

3) Make a line graph with Year on the x-axis. On the y-axis include the following 5 lines:
Line 1: # of Cattle depredated by wolves for 3 states combined
Line 2: # of Sheep depredated by wolves in 3 states combined
Line 3: # of "other" animals depredated by wolves in 3 states combined
Line 4: # of Dogs depredated by wolves in 3 states combined
Line 5: # of Wolves Killed for Management Control in all 3 States Combined
Name this graph:
Fig. 3. Number of Wolf Depredations and Number of Wolves Killed for Control in ID, MT, and WY Combined During 1987-2014

STEP 4: Wolf Depredations, Wolves Hunted, and Minimum Population Estimate of Wolves in Montana

Now open Dataset 4, called "Table 4_Montana Data". This table includes data on the number of animals depredated by wolves in Montana, the number of wolves legally hunted in Montana, and the Minimum Population Estimate of Wolves in Montana.

Follow the instructions for analyzing data in Table 4:

1) Make a line graph with Year on the x-axis. On the y-axis include the following 6 lines:
Line 1: # of Cattle depredated by wolves in Montana
Line 2: # of Sheep depredated by wolves in Montana
Line 3: # of "Other" animals depredated by wolves in Montana
Line 4: # of Dogs depredated by wolves in Montana
Line 5: Minimum Population Estimate of Wolves in Montana
Line 6: # of Wolves Legally Hunted in Montana
Name this graph:
Fig. 4. MT Data for Number of Wolf Depredations, Wolves Hunted, and Minimum Population Estimate for Wolves, 1987-2014

STEP 5: Wolf Mortalities in Montana

You're almost done. Open Dataset 5 called "Table 5_Montana Data". This table includes data on the number and kinds of wolf mortalities in Montana during years 2011-2014. This table also includes "Minimum Year-End Population Estimates for Wolves" in Montana and "Minimum Year-End Population Estimates for Wolves in Montana BEFORE Human-Caused Mortality" Hmmmmm.......what does that last category mean? It means:

 "This is the minimum number of wolves that WOULD HAVE been alive at the end of the year if no human-caused wolf mortalities occurred during that year"

Follow the instructions for analyzing data in Table 5:

1) Fill in the missing values for "Total Human-Caused Mortalities"
(i.e., fill in the yellow-shaded cells in column H)

2) Make a line graph showing Year on the x-axis. On the y-axis include 2 lines:
Line 1: Minimum Year-End Wolf Population Estimate
Line 2: Minimum Year-End Wolf Population BEFORE human-caused mortality
Name this graph:
 Fig. 5. Annual Minimum Year-End Wolf Population Estimates Before and After Human Caused Mortality, 2011-2014

STEP 6: Number of Elk Harvested in the Northern Rocky Mountains

Time to look at some data on elk. Open Dataset 6 called "Table 6_Elk in Montana. This table includes information about the estimated number of elk in two different hunting districts in Montana for years 1986-2015.

Note: if a cell is blank, it means that data were not available for during that specific year.

Follow instructions for analyzing data in Table 6:

Instructions for Analyzing Data in Table 6
1) Make a line graph showing Year on the x-axis. On the y-axis include 2 lines:
Line 1: Estimated Elk Population Size in Montana Hunting District 203
Line 2: Estimated Elk Population Size in Montana Hunting District 121
Name this graph:
 Fig. 6. Estimated Elk Population Size in Montana Hunting Districts 203 and 121, Years 1986-2015