**STUDENT PAGES: Questions About Excel Datasets**

**Delisting Criteria for Gray Wolves in the Northern Rocky Mountains:**

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.

**Table 1 and Figure 1:**

1. In the box below, cut and paste Figure 1 that you created:

(If you do not have a digital copy of this page, cut and paste Figure 1 on a separate page)

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

1. What does “Minimum Year-End Population” estimate mean?

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1. The Delisting Criteria states that at least 300 wolves must be equitably distributed in Montana, Wyoming, and Idaho for 3 consecutive years. So that means at least HOW many wolves must be present in each of the 3 states? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. For Montana, in what year did the Minimum Year-End Estimated Wolf Population first equal 100? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. For Wyoming, in what year did the Minimum Year-End Estimated Wolf Population first equal 100? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. For Idaho, in what year did the Minimum Year-End Estimated Wolf Population first equal 100? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. What was the first year in which Montana, Wyoming and Idaho each had at least 100 wolves for 3 consecutive years? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. How long did it take the Idaho population of 42 animals in 1996 to quadruple its size? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. During 1995-1996, 34 gray wolves were reintroduced into Central Idaho. By the end of 1996, there were at least 42 wolves. By 2009, how many wolves were in Idaho? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What does this tell you about gray wolf reproductive potential?

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1. What was the minimum number of wolves in the 3 states combined in 1995? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What was the minimum number of wolves in the 3 states combined in 2004? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What was the minimum number of wolves in the 3 states combined in 2009? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. The US Fish and Wildlife Service (USFWS) was the federal agency responsible for managing wolves while the gray wolf was listed as endangered. The USFWS defined the Delisting Criteria for gray wolves, which included the requirement that the minimum number of wolves must be at least 100 for each state for at least 3 consecutive years. When the gray wolf was delisted in 2011, management of the gray wolf was returned back to the state wildlife agencies in Montana, Idaho, and Wyoming (remember, however, that wolves in Wyoming were relisted in 2014 and, at that point, management of Wyoming wolves was returned to USFWS).

In 2011, the USFWS developed new criteria that required the states to maintain a 50% buffer above minimum Delisting Criteria to ensure the wolf population never fell below minimum delisting goals.

The new criteria were then subdivided equally among the states of Montana, Idaho, and Wyoming, resulting **in a minimum population requirement of ≥150 wolves and ≥15 breeding pairs in each of the 3 states.** Since 2011, has the minimum number of wolves fallen below 150 for MT, ID, or WY? \_\_\_\_\_\_\_\_\_\_\_\_\_

1. When did wolves start to show up in Oregon and in Washington? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Table 2 and Figure 2:**

1. In the box below, cut and paste your Figure 2:

(If you do not have a digital copy of this page, cut and paste Figure 2 on a separate page)

Fig. 2. Minimum Number of Breeding Pairs of Gray Wolves in MT, ID, WY and All 3 States Combined, 1982-2014

1. What does a “breeding pair” mean?

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1. The Delisting Criteria states that at least 30 breeding pairs must be distributed equitably among Montana, Wyoming, and Idaho for 3 consecutive years. So that means, the number of breeding pairs in each of the 3 states needs to be at least \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for at least 3 consecutive years.
2. When was this part of the Gray Wolf Delisting Criteria first met? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Why didn’t biologists identify any breeding pairs in Idaho and Wyoming prior to 1995-1996?

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1. Based on your analyses of data in Tables 1 and 2 (and Figures 1 and 2), have gray wolves in the Northern Rocky Mountains met Delisting Criteria? Why or why not?

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1. Remember the new criteria for gray wolves in the Northern Rocky Mountains defined in 2011? Look again at question #14. After wolves were delisted, the new criteria mandated **a minimum population requirement of ≥150 wolves and ≥15 breeding pairs in each of the 3 states**. Since 2011, has the number of breeding pairs fallen below 15 for Montana, Idaho, or Wyoming? \_\_\_\_\_\_

**Table 3 and Figure 3:**

1. In the box below, cut and paste your Figure 3 here:

(If you do not have a digital copy of this page, cut and paste Figure 3 on a separate page)

Figure 3. Number of Wolf Depredations and Number of Wolves Killed in Control in ID, MT, and WY Combined, for Years 1987-2014

1. Which 2 animal species were depredated by wolves most: sheep, cattle, dogs, or “other” animals? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Look at Table 3. Which state had the most number of confirmed depredations by wolves?

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1. Why were some wolves lethally removed?

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1. In MT, ID, and WY combined, the number of sheep depredated greatly increased around year 2008 and 2009, but then decreased again. Why did the number of sheep depredated decrease around year 2009? Write your hypothesis here: (HINT: look at Figure 3 closely....there’s information here to help you out)

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1. What is the total number of dogs killed by wolves in all 3 states combined during all years combined? (Hint: look at cell S35): \_\_\_\_\_\_\_\_\_\_\_\_\_
2. What animals are included in the “other” category? (HINT: look again at Table 3):

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Table 4 and Figure 4.

1. In the box below, cut and paste your Figure 4:

(If you do not have a digital copy of this page, cut and paste Figure 4 on a separate page)

Figure 4. Montana Data for Number of Wolf Depredations, Wolves Hunted, and Minimum Year-End Population Estimate for Wolves, Years 1987-2014

1. Look at Figure 4. Overall, what did the trend line look like for the Minimum Population Estimate of wolves in MT between 1987-2011?

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1. After 2011, the wolf population began to decrease. Why?

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1. Go back and look at your answer to Question 10. If wolves in Montana were not allowed to be hunted and if there was no management control to reduce livestock-wolf conflicts, what do you think would happen to the wolf population? What do you think the line for “Minimum Population Estimate for Wolves” might look like for years 2012-2014, in the absence of legal wolf hunting and removal of conflict wolves?

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**How many wolves should be on the landscape?**

AH! THIS is the million dollar question! Some folks feel that zero wolves should be in the Northern Rocky Mountains. Some folks feel that 50,000+ wolves should be in the Northern Rocky Mountains. As a class, you will be evaluating this question (and other questions) during your stakeholder meeting.

For now, let’s look at how many wolves are in Montana and how this Montana wolf population is managed to ensure long-term sustainability.

Table 5 and Figure 5

1. In the box below, cut and paste your Figure 5:

(If you do not have a digital copy of this page, cut and paste Figure 5 on a separate page)

Figure 5. Annual Minimum Year-End Wolf Population Estimates in MT Before and After Human-Caused Wolf Mortality, 2011-2014

1. When the gray wolf in the Northern Rocky Mountains was delisted in 2011, the management of wolves that lived in Montana was returned to Montana Fish, Wildlife, and Parks (the Montana state government wildlife agency).

What does the Public Trust Doctrine state?

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1. For the management of any wildlife population (including wolves) what is the basis for decision-making?

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1. Remember that in 2011, the USFWS came up with new criteria for gray wolves. In each of the 3 states (Montana, Idaho, and Wyoming), state wildlife agencies had to maintain at least 150 wolves and at least 15 breeding pairs to ensure that the gray wolf population would persist sustainably over the long term.

**In Montana, the state-wide management goal for the gray wolf population is to maintain between 450-600 individuals.** This is higher than the federal mandate by USFWS.

Look at Figure 5. During 2011-2014, did the wolf population in Montana ever fall below 450? If yes, state the year/s: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. During 2011-2014, did the wolf population in Montana ever exceed 600? If yes, state the year/s:

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1. Look at Table 5. If no human-caused wolf mortalities had occurred in Montana during 2011, what would have been the Year-End Minimum Population Estimate for wolves in Montana in 2011? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. When a wildlife population exceeds a population goal, what are the strategies that a wildlife agency can use to help keep the population in balance for the purpose of sustainably managing it?

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1. Look at Table 5. During 2011-2014, the number of wolves that were legally harvested was lowest in 2012. Can you think of a reason why relatively fewer wolves were allowed to be legally hunted during 2012? (HINT: look at how many wolves were killed for control and killed from other non-harvest human causes during 2012):

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Table 6 and Figure 6

1. In the box below, cut and paste your Figure 6:

(If you do not have a digital copy of this page, cut and paste Figure 6 on a separate page)

Figure 6. Estimated Elk Populations in Montana Hunting District 121 and Montana Hunting District 203, Years 1986-2015

43. Remember that as gray wolf populations in the Northern Rockies increased, some elk hunters began reporting that it was more difficult to find elk. Many hunters said that this was because elk herds were declining due to wolf predation. Look closely at Figure 6. It’s important to know that wolf packs were and are present in both Hunting Districts 121 and 203. What does Figure 6 suggest about the effect of wolves on elk herds in these two Hunting Districts?

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Want to see where Hunting District 121 and Hunting District 203 are located? Go to Montana Fish Wildlife and Parks website to find out: <http://fwp.mt.gov/gis/maps/huntPlanner/?species=deer>

44. The elk herd in Montana Hunting District 203 is one that Montana state elk biologists think has been negatively impacted by wolves.  Wolf predation may not explain all of the decline in the elk herd in Hunting District 203, but wolf predation was most likely responsible for some of it. There are reasons other than wolf predation that can lower an elk herd during any given year. Can you name other possible reasons?

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45. There are numerous variables that can affect whether or not a hunter successfully hunts an elk. Think about what these reasons might be and describe them below:

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