Version B

Student Pages: Individual Activity

Instructions for this Activity
You will be given an excel file that contains 6 datasets. Before you open your excel file, read the information and instructions in these Student Pages carefully.

Each excel dataset includes real-world data on the grizzly bear population in the Greater Yellowstone Ecosystem (GYE) collected by the Interagency Grizzly Bear Study Team (IGBST). They collected these data to evaluate and monitor population trend, abundance, reproduction, and geographic distribution of the grizzly bear population in the GYE.

Before the grizzly bear population in the GYE can be considered for delisting, it must meet the following 3 Demographic Recovery Criteria:

Demographic Recovery Criterion 1
"Because 48 adult females with cubs of the year is equivalent to a population of approximately 500 total individuals (IGBC, p. 43), we are establishing a target number of 48 adult females of the year. This target number shall not go below 48 for any two consecutive years. For genetic reasons (Miller and Waits 2003, p. 4338) it is desirable that the total population of grizzly bears in the GYA be maintained above 400 bears. To assure that this goal is met and in order to adopt a conservative approach, the total population will be maintained at or above 500 grizzly bears. The estimate of 48 adult females with cubs of the year will be calculated by the IGBST based on model averaging described in the Supplement to the Reassessing Methods Document (IGBST 2006, pp.2-10)."

Demographic Recovery Criterion 2
"Sixteen of 18 bear management units within the Recovery Zone must be occupied by females with young, with no two adjacent bear management units unoccupied, during a 6-year sum of observations. This criterion is important as it ensures that reproductive females occupy the majority of the Recovery Zone and are not concentrated in one portion of the ecosystem."

Demographic Recovery Criterion 3
"For independent females (at least 2 years old), the current annual mortality limit, not to be exceeded in 2 consecutive years and including all sources of mortality, is 9 percent of the total number of independent females. For independent males (at least 2 years old), the current annual mortality limit not to be exceeded in 3 consecutive years and including all sources of mortality, is 15 percent of the total number of independent males. For dependent young (less than 2 years old), the current annual mortality limit, not to be exceeded in 3 consecutive years and including only known and probable human caused mortalities, is 9 percent of the total number of dependent young."

ADDITIONAL INFORMATION ABOUT THE DELISTING PROCESS: The goal of the Endangered Species Act (ESA) is to recover species back to the point where they no longer need federal protection.

When a species is listed as Threatened or Endangered, management is moved from the state wildlife agencies to the federal US Fish and Wildlife Service. Before any listed species or population can be delisted, the US Fish and Wildlife Service evaluates the following 5 factors:

> 1. Is there a present or threatened destruction, modification, or curtailment of its habitat or range?
> 2. Is there overutilization for commercial, recreational, scientific or educational purposes?
> 3. Is there disease or predation?
> 4. Is there inadequacy of existing regulatory mechanisms?
> 5. Are there other natural or human-caused factors affecting the population's continued existence?

Okay, let's get started! Go ahead and open your excel file entitled "GYE Grizzly Bear Datasets". This excel file includes 6 Datasets.

Each data set has a title, a description of column labels (located at the bottom of each table), and instructions located in a BLUE BOX.

STEP 1: Demographic Recovery Criterion #1

- This Demographic Recovery Criterion includes **3 datasets (Dataset 1, Dataset 2, and Dataset 3)**

First, read the short paragraph that describes Recovery Criterion #1 again (it's located a few paragraphs above this paragraph) so you know why you are evaluating these data.

Start with Dataset 1 first. Follow the instructions in the blue box for Dataset 1, located to the right of Dataset 1 in the Excel file.

Definitions for column headings are provided at the bottom of each table. For example, the definition of "Cubs of the Year" is this: cubs that were born during the year of observation. So an adult female with cubs of the year will have cubs with her that are between 0-12 months old on the day that she was observed in the wild by a grizzly bear biologist.

For now, don't worry too much about what exactly things like "Minimum Population Estimate" mean; this information will be provided to you when you begin the Student Group Activity.

When you have completed Dataset 1, complete the instructions for Dataset 2, and move on to Dataset 3. Follow the instructions in the blue box for Dataset 3.

When you're done with Datasets 1-3, take a break! Whew! You're done with datasets related to **Demographic Recovery Criterion #1**!

STEP 2:   Demographic Recovery Criterion #2

- This Demographic Recovery Criterion includes **1 Dataset (Dataset 4) and 1 Figure**

Now you are ready to begin evaluating data for Demographic Recovery Criterion #2. Read the short paragraph about the Demographic Recovery Criterion #2 so you know why you are evaluating these data. Then, open **Dataset 4** and look at **Figure 1**. Follow the instructions in the blue box, located to the right of the table in Dataset 4.

STEP 2:   Demographic Recovery Criterion #3

- This Demographic Recovery Criterion includes **2 Datasets (Dataset 5 and Dataset 6)**

Now you are ready to begin evaluating data for Demographic Recovery Criterion #3. Read the short paragraph that describes the Demographic Recovery Criterion #3 again so you know why you are evaluating these data. Open **Dataset 5** and follow the instructions in the blue box. When you have completed Dataset 6, open **Dataset 6** and follow the instructions in the blue box.

That's it! At this stage of the game, you might have some questions about some of the data and you might not completely understand why you created all those graphs. No worries. Things will become clear during the Student Group activity, which happens next.....