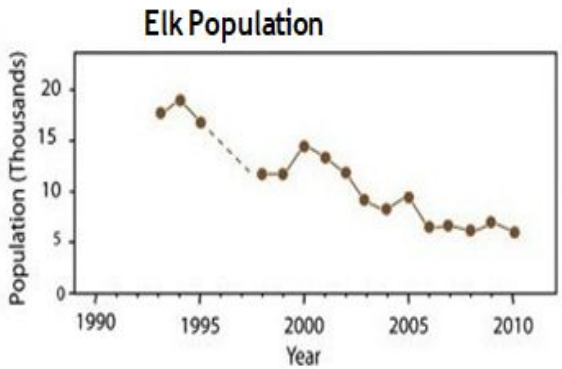
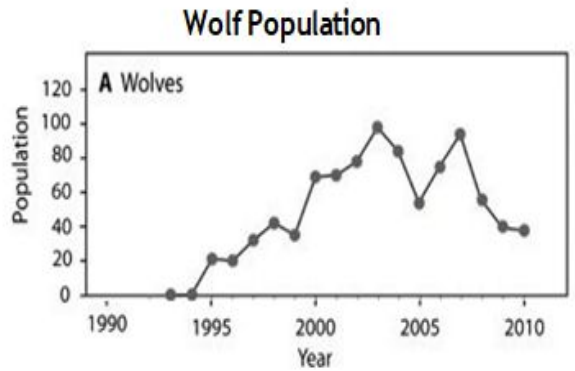
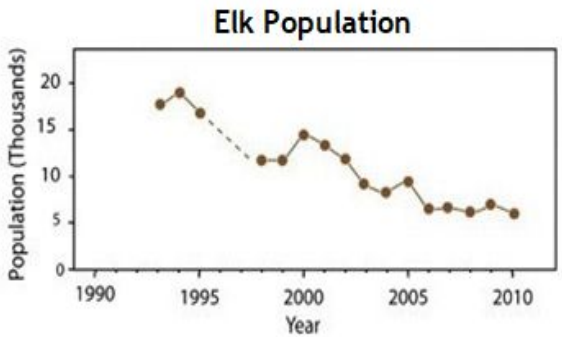
Yellowstone Data Analysis

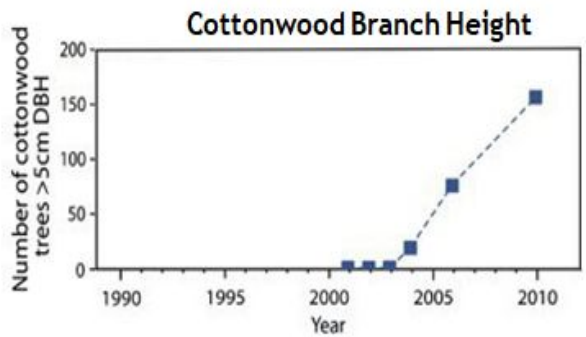
The graphs in the next section were taken from the 2012 study by William Ripple and Robert Beschta on trophic cascades in Yellowstone National Park. With your group, inspect the graphs below that show changes in populations of wolves, elk, beavers, and various types of trees. Discuss the following questions, prepare answers to share with class. **Support all your answers with data**.

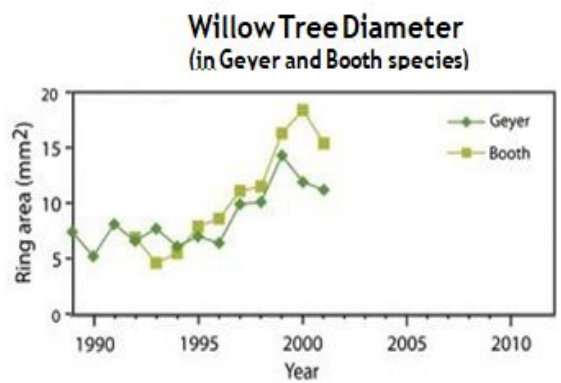
1. Based on the graphs, what year were wolves reintroduced to Yellowstone?
2. What is the general trend in the the elk and wolf populations between 1990 and 2000?
3. Use information from the graphs to describe the change in the size and growth of the trees and the population of elk during the data collection periods depicted in the graphs. Pay close attention to dates. Remember what you have learned about predator and prey relationships.
4. Riparian refers to trees growing around a stream or river bed. From 2000- 2010, which trees do you think are being foraged more, the upland or the riparian? What explanation can you offer for this?
5. After 2000, what relationship do you see between the beaver population and the willow tree? Explain what is causing the changes in their populations.

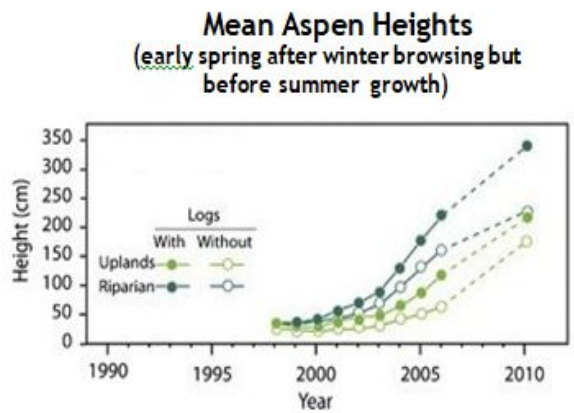

Elk Population
Population (Thousands)
20
15
10
5
0
1990
1995
2000
2005
2010
Year

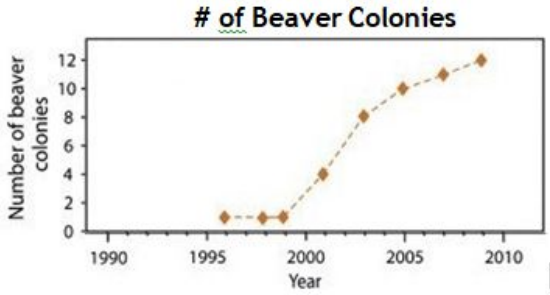

Wolf Population
A Wolves
Population
120
100
80
60
40
20
0
1990
1995
2000
2005
2010
Year

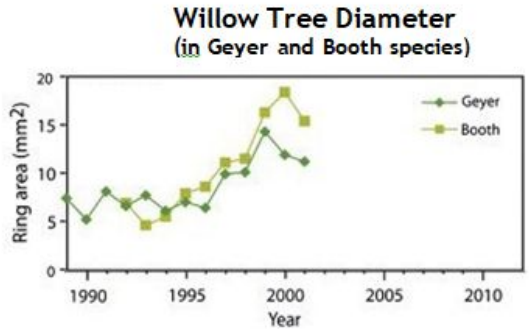

Elk Population
Population (Thousands)
20
15
10
5
0
1990
1995
2000
2005
2010
Year


Cottonwood Branch Height
Number of cottonwood trees >5cm DBH
200
150
100
50
0
1990
1995
2000
2005
2010
Year


Willow Tree Diameter
(in Geyer and Booth species)
Ring area (mm2)
20
15
10
5
0
Geyer
Booth
1990
1995
2000
2005
2010
Year


Mean Aspen Heights
(early spring after winter browsing but before summer growth)
Height (cm)
350
300
250
200
150
100
50
0
Logs
With Without
Uplands
Riparian
1990
1995
2000
2005
2010
Year


# of Beaver Colonies
Number of beaver colonies
0
2
4
6
8
10
12
1990
1995
2000
2005
2010
Year


Willow Tree Diameter
(in Geyer and Booth species)
Ring area (mm2)
0
5
10
15
20
1990
1995
2000
2005
2010
Year
Geyer
Booth