Name: _____ Date: _____ Period: _____

THE LESSON OF THE KAIBAB

Introduction: The carrying capacity of an ecosystem is the maximum number of organisms that an area can support over time. The density of a population may cause huge changes in the environment so that the environment becomes unstable for the survival of that species. Human interactions can also have either a positive or negative effect.

Before 1905, there was an estimated 4000 deer on almost 30,000 hectacres of land on the Kaibab Plateau in Arizona. The average carrying capacity of the land at that time was estimated to be about 30,000 deer. Being concerned about the low number of deer, President Theodore Roosevelt created the Grand Canyon National Game Preserve to protect what he called the "finest deer herd in America." He did this on November 28, 1906.

Unfortunately, by this time, the Kaibab forest area had already been overgrazed by sheep, cattle and horses. Most of the grasses (the main source of food for the Kaibab deer) were gone. The first step to protect the deer was to ban all hunting. In addition, in 1907, the Forest Service tried to kill all predators of the deer. Between 1907 and 1939, 816 mountain lions, 20 wolves, 7388 coyotes, and more than 500 bobcats were killed. All of these animals had been predators of the deer.

Procedure

1. Label the X and Y axis of the graph. You will be plotting the Deer Population between the years of 1900 and 1940.
2. Using one color or symbol, draw in the carrying capacity of the deer. Label this line "Average Carrying Capacity."
3. Using another color or symbol, graph the deer population data from Table 1 (Deer Population 1905-1924).
4. Answer the analysis questions 1-4.

Signs that the deer population was out of control began to show up as early as 1920 — the area was beginning to worsen quickly. The Forest Service reduced the number of permits it issued for livestock grazing. By 1923, the deer were close to starvation and the area conditions were horrible.

A Kaibab Deer Investigating Committee suggested that all livestock not owned by local people be removed from the area right away and that the number of deer be cut in half as quickly as possible. Hunting was reopened, and during the fall of 1924, 675 deer were killed by hunters. However, the 675 deer represented only 1/10 the number of deer that were born that spring.

5. Using a third color or symbol, plot the data from Table 2 (Deer Population 1925-1939) on your graph.
6. Create a title for the completed graph.
7. Answer the analysis questions 5-6.

Today the Arizona Game Commission carefully manages the Kaibab area with rules that have local needs in mind. Hunting permits are issued to keep the deer in balance with the area. Predators are protected to help keep herds in balance with food supplies. Tragic winter losses can be kept under control only by keeping the number of deer near or below the carrying capacity of the range.

8. Answer the rest of the analysis questions.

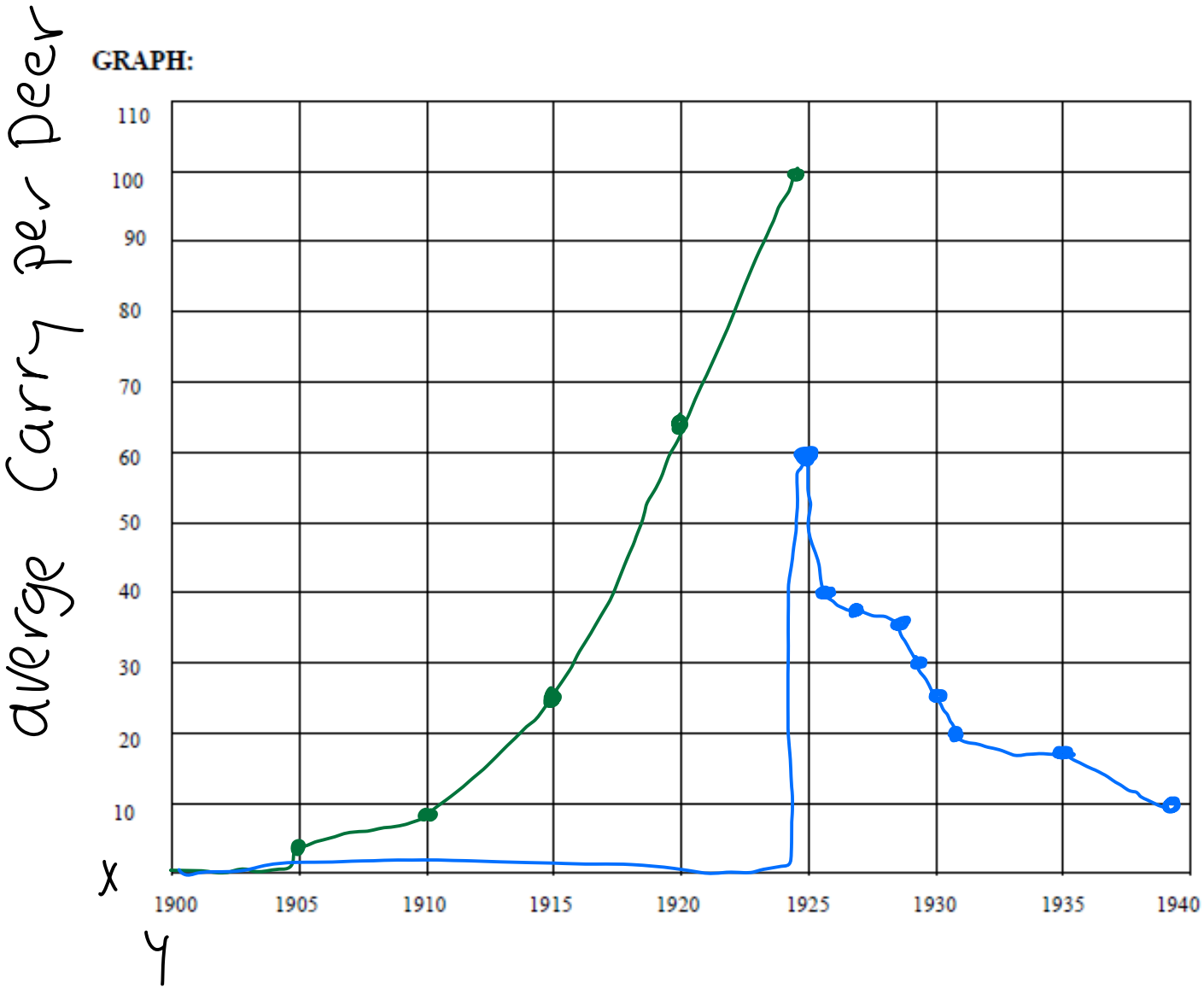
DATA: Table 1 (saving deer)

Deer Population from 1905-1924	
Year	Number of Deer
1905	4,000
1910	9,000
1915	25,000
1920	65,000
1924	100,000

Table 2 (killing deer)

Deer Population from 1925-1939	
Year	Number of Deer
1925	60,000
1926	40,000
1927	37,000
1928	35,000
1929	30,000
1930	25,000
1931	20,000
1935	18,000
1939	10,000

GRAPH:



Analysis Questions

1. In 1906 and 1907, what two methods did the Forest Service use to protect the Kaibab deer?

They ban all people from hunting.

2. How many total predators were removed from the preserve between 1907 and 1939?

About 8724 were killed

3. Compare the deer herd to the carrying capacity of the area:
   a. In 1915 Table 1 had 25,000. Table 2 had 0
   b. In 1920 Table 1 had 65,000. Table 2 had 0
   c. In 1924 Table 1 had 100,000. Table 2 had 0

4. Was the Forest Service program a success between 1905 and 1924? Explain your answer.

They were success because they ban all hunting and none of the deers were able to be killed.

5. Why do you think the population of deer decreased in 1925, even though the predators were being removed?

Maybe they was no food for them to eat and they just died off from starving.

6. Do you think anything happened to the carrying capacity of the area from 1900 to 1940? Explain your answer.

most likely the capacity of Deer will propably kept going down because other species in the forest is taking over.

7. Why do you think the population of deer in 1900 was only 4,000 when the range was thought to have a carrying capacity of 30,000 deer?

Because hunters kept on killing the Deer and the Deer population stayed the same.

8. If humans had not interfered with the deer population. What do you think would have happened to the deer after 1900?

The Deer population would stay exactct because there would be no hunters to kill them.

9. What major lessons were learned from the Kaibab deer experience?

To not over deer and not to interfear with the forest population. And if you want to hunt deer you need a permit to kill, to balance the amount of deer in the forest.