

Happy Fishing

The purpose of this simulation is to demonstrate how individuals using a common resource (the commons) for their own personal gain will inevitably result in the degradation of the commons, and a decrease the yield for both the group and the individual.

Materials:

- 1-“fishing pole” (2 straws taped together)
- 1-“ocean” with 20 “fish” (bowl of M&Ms)



Procedure:

Part I:

Your group will get an ocean full of fish, each group member will get a fishing pole, and the entire group will fish for several years. Between fishing seasons the fish will reproduce until they reach the carrying capacity of the ocean. A bonus will be given to the member of each group who catches the most fish.

- To “fish” you must use the fishing pole to “suck” the fish out of the ocean.
- The “ocean” has a carrying capacity of 20—so there will never be more than 20 fish in the ocean.
- Fish one “season” at a time, which represents one generation of fish. Each student may catch as many as he/she wants. They need at least one fish or they will starve.
- After the first fishing season (60 seconds), stop fishing, and the fish will “reproduce.” For every fish left in the bowl, another will be added, up to the carrying capacity of 20.
- Record the number of fish caught during each season by each individual and by the group.
- Fish for another season. Stop and let the fish reproduce.
- Repeat.

Part II:

This part is exactly like the first, except that in this simulation, everyone has a private pond in addition to the common pond. The private ponds can only hold a maximum of 3 fish, although all other rules apply. You may catch as many fish as you would like from both ponds during each round.

RESULTS

To be placed in your lab notebook.

Part I: Commons pond

Round #	Initial # of fish	# taken by fisher 1	# taken by fisher 2	# taken by fisher 3	# taken by fisher 4	Total left at the end of the round

Part II: Commons pond

Round #	Initial # of fish	# taken by fisher 1	# taken by fisher 2	# taken by fisher 3	# taken by fisher 4	Total left at the end of the round

Part II: Private pond

Round #	Initial # of fish	# of fish taken this round	Total left at the end of the round

Your results section should include data tables, and the answers to the following questions for each part separately (not for each table!) in complete sentences.

- The total number of fish caught by each person
- The total amount of fish that could have been taken from the pond over the trial period if the fish had been managed perfectly. (Show your calculations!)
- Your "management score" = what percent of the total possible amount of fish that could be caught by all fishers were actually caught? (Show your calculations!)

Analysis:

Discuss your results in paragraph form, and make sure that you address the following questions:

- What happened to the common resource in Part I? Why?
- Did you get different results for the pond in Part II? Why?
- Explain the rationale for your fishing technique.
- If you cooperated with other fishers, what was the result of that cooperation?
- Did you use different fishing strategies in the common pond and the private pond?
- Why does common usage lead to exploitation?
- What would be the ideal way to manage the common pond?
- How does the number of fish received by each fisher compare to the maximum possible for each? (You will need to discuss your rationale for this since the max. # of fish also depends on the private pond—this is not the same as the minimum # for sustainability!)
- What is your management score and what are some ways that you could use to improve it?

Postlab:

Briefly summarize the results of this simulation, and discuss the implications of this simulation on the management of common resources in the environment. In your summary please discuss relationships between human societies and the environment as well as possible methods to remediate overuse through cooperation. What other resource management examples can you think of where this topic is relevant? What would you suggest in these situations?

Suggestions for Further Investigation:

What changes would you make to this lab to advance your studies on this subject matter?

