



The Sustainable Use of Fisheries

a flash-based classroom tool for teaching population biology and sustainable resource management



Names of group members: _____

Game #1:

Game Mode = REPLENISHING, Catch Probability = 4%, Carrying capacity = 100 hauls per person

General Set-up of the Game:

- A. Your group is a small village that sustains itself through fishing.
- B. Each member of the village must independently choose how many boats to put out to fish during each year. All players start with 5 boats; depending on your fishing success, you may gain or lose boats from year to year.
- C. Each boat has the potential to gather ten “hauls” of fish per year. For simplicity, we will use the “haul” as our unit to measure the population size of fish in the ecosystem.
- D. In your village, fishing is the chief industry and fishing success translates directly to wealth, social prestige, and reproductive success. Your goal is to maximize the number fish you catch and boats you own relative to your fellow villagers.

How to play:

1. Point your web browser [here](#).
2. After you have read the introduction to the game, hit the “PLAY THE GAME” button.
3. On the “Game Set-Up” page, complete the following settings:
 - a. Set the *number of players* in your group.
 - b. Set the *game mode* to “replenishing”.
 - c. Set the *catch probability* to “4%”.
 - d. Set the *carrying capacity of the fishery* to “100” hauls per person.
 - e. Select “CONTINUE” by clicking on the box labeled “fresh fish”.
4. Enter in the first players’ name and select an avatar. Select “Next Player” and enter in the names for subsequent players.
5. The game will play for 20 years. During each year, each player must specify how many boats he/she will put out. This selection should be made without the knowledge of the other players.
6. At the end of the game, the number of boats put out and fishing success of each player will be revealed. Record this information on the table provided on page 2.
7. After you have recorded the results of your game in the table, answer the questions on the bottom of page 2.

Results of Game #1:

Player		TOTALS
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	

Questions after Game #1:

1. Who ended up with the largest amount of fish?
2. How does the strategy of this villager compare with the others?
3. What does this outcome tell you about a system in which members of a group can use a common resource in anonymity and without limit?
4. In what ways were the rules of this game ecologically unrealistic?



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Game #2:

Game Mode = DYNAMIC, Catch Probability = 4%, Carrying capacity = 100 hauls per person, Fecundity Rate = 100%

General Set-up of the Game:

- A. This round of the game is played in the same manner as the previous round with one notable exception: we now assume that overfishing in the present year affects fish yield in the subsequent year.
- B. This penalty is paid for equally by all villagers, regardless of who put out the most boats.
- C. Although group members now will be aware of the number of boats that each player puts out, there is no way to penalize other villagers for being overly self-interested.

How to play:

1. On the "Game Set-Up" page, complete the following settings:
 - a. Set the *number of players* in your group.
 - b. Set the *game mode* to "dynamic".
 - c. Set the *catch probability* to "4%".
 - d. Set the *carrying capacity of the fishery* to "100" hauls per person.
 - e. Set the *fecundity rate* to 100%.
 - f. Select "CONTINUE" by clicking on the box labeled "fresh fish".
2. As before, set up each player by entering in his/her name and selecting an avatar.
3. The game will play for 20 years. During each year, each player must specify how many boats he/she will put out. As before, this selection should be made without the knowledge of the other players.
4. As the game is played, record the fishing success of each player.
5. At the end of the game, the number of boats put out and fishing success of each player will be revealed. Record this information on the table provided on page 4.
6. After you have recorded the results of your game in the table, answer the questions on the bottom of page 4.

Results of Game #2:

Player		TOTALS
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	

Questions:

1. Who ended up with the largest amount of fish?
2. How does the strategy of this villager compare with the others?
3. How much fish did the group itself yield in the twenty (20) year period?
4. What factors influenced the group's total yield?



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Game #3:

Game Mode = DYNAMIC, Catch Probability = 4%, Carrying capacity = 100 hauls per person, Fecundity Rate = 100%

General Set-up of the Game:

- A. This round of the game is played in the same manner as the previous round with two notable exceptions: the number of boats put out is no longer anonymous, and we now allow villagers to punish other members of the village for being selfish.
- B. Before boats are put out to sea, villagers can choose to join together and punish others who put out an excessive number of boats in the previous year.
- C. Before the game begins, your group must decide on a set of rules for punishing selfish behavior.

How to play:

1. Record your punishment rules here:

2. Use the same settings from **Game #2**.
3. For this round, the number of boats put out by each player should be selected so that it can be witnessed by other players.
4. At the end of the game, the number of boats put out and fishing success of each player will be revealed. Record this information on the table provided on page 6.
5. After you have recorded the results of your game in the table, answer the questions on the bottom of page 6.

Results of Game #3:

Player		TOTALS
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	
	Boats Put Out:	
	Fish Caught:	

Questions:

1. What effect does punishment for selfishness have on the village's total yields?
2. How effective was your regulation scheme? Did your punishment rules achieve your goals?
3. In what ways could you improve on the regulation scheme that you used?