**“A Common Property Experiment with a Renewable Resource”**

Adapted from Prof. Denise Hazlett, Whitman College

Objective:

Maximize your profits without over-harvesting a common-property resource

Learning:

Property rights, externalities (water pollution), bargaining, cooperation, profit & loss

Instructions:

Students jointly own a renewable resource and must make harvesting decisions over a number of periods under three schemas. A plate of fish crackers serves as the resource (representing Salmon or related natural resource). At the beginning of the first period the plate holds a number of Salmon equal to 10 times the number of students in the class. This amount of Salmon constitutes the plate's carrying capacity, so the plate can at no point hold more Salmon. In each period, each student privately writes down the number of Salmon he or she desires to harvest. No student can harvest more than 20 Salmon in any one period. If, after students reveal their desired harvest simultaneously and publicly, the "total desired harvest is less than or equal to the number of Salmon on the plate”, then each person takes their desired harvest. If the total desired harvest exceeds the number of Salmon on the plate, then each student gets a prorated share of the total harvest. The Salmon left on the plate after harvest will reproduce, provided a viable population remains, which is at least 8 Salmon. If a viable population remains, then each Salmon has four (4) offspring, so that the total Salmon on the plate will increase 5X (if the carrying capacity permits). After reproduction, another period begins. If less than 8 Salmon remain after a harvest, the population crashes, and each player must buy a new license in order to restock the resource. Otherwise, the experiment continues for a predetermined (though unknown to the students) number of periods. No communication is allowed between students. The second experiment allows communication. The third experiment designates a portion of the plate as the private property of each student. Each portion of the plate has a carrying capacity of 10 Salmon. The experiment proceeds as before.

Prices

License to fish, initially $100

Restocking fee, if population crashes $100

Profit, per fish harvested $10

Variations:

1. Vary the level of communication: Round 1 no comm’n, Round 2 comm’n but private bid, Round 3 comm’n and open bid, Round 4 announce bid around table, Round 5 negotiate openly.
2. Introduce a paper mill (externality) which earns income each round for each player as a shareholder. The problem is, the paper mill also pollutes the Salmon habitat, reducing the harvest each round. Students must then decide whether to 1) allow the pollution to continue, 2) reduce the plant’s output but also reduce their income from the plant, 3) purchase expensive pollution control equipment for the plant, or 4) shut down the plant.