



The fishing game

Background reading for teachers

This reading gives you the background for each slide, with sources you can check.

The state of world fisheries

The FAO's 2026 State of World Fisheries and Aquaculture report found 62.4% of assessed stocks fished within biologically sustainable levels and 37.6% overfished.¹

Hardin and Ostrom

Garrett Hardin's 1968 essay "The tragedy of the commons" argued that shared resources are overused because each user gains from taking more.² Elinor Ostrom's research showed many communities avoid this by creating and enforcing their own rules, and she shared the 2009 Nobel Prize in Economic Sciences for her analysis of how commons are governed.³ The Apo Island story in lesson 2 is a real example.

Big old fat fecund female fish

A 2018 study of 342 marine fish species found that in 79% of them, reproductive output increases disproportionately with body size. Larger mothers produce more and larger eggs than the same weight of smaller mothers, so removing big fish harms replenishment more than models had assumed. One illustration from the study: 37 two-kilo cod produce as much reproductive output as a single 30-kilo cod.^{4, 5}

The game

The game is a simple renewable-resource model: growth of 50% of what remains, capped at a carrying capacity of 24. The sustainable maximum in the game is 8 fish a season. Real fisheries are messier, but the pattern of collapse under open access, recovery under agreed limits, and buffering by reserves is well established.

Sources

1. FAO (2026). The State of World Fisheries and Aquaculture 2026. [fao.org](https://www.fao.org)
2. Hardin, G. (1968). The tragedy of the commons. *Science* 162: 1243-1248.
3. The Nobel Prize (2009). Elinor Ostrom, Prize in Economic Sciences. [nobelprize.org](https://www.nobelprize.org)
4. Barneche, D.R. and others (2018). Fish reproductive-energy output increases disproportionately with body size. *Science* 360: 642-645.
5. Oceanbites (2018). Big momma: bigger fish are better moms. oceanbites.org/big-momma-bigger-fish-are-better-moms/

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