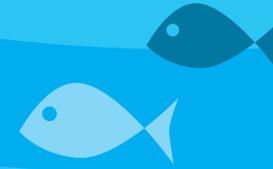


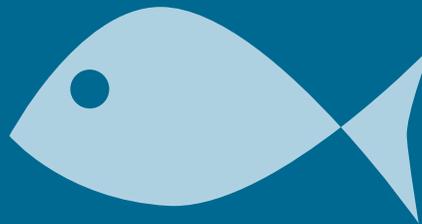
# What's the Catch?



## A Fishing Game

### Dear Fishery Managers,

Welcome to **What's the Catch?**, an interactive game that allows players to experience the joys and sorrows of fishing. By managing the fan-tailed goldfish fishery, players will learn first-hand the failures of conventional fisheries management and the benefits of catch share management. As the fishery manager, you will lead players through the game and facilitate a discussion afterwards.



**GOOD LUCK!**

The success and sustainability of this fishery is in your hands.

Here are some helpful suggestions to review before you manage your first fishery.

- Read all directions prior to playing.
- Play a practice fishing season first.
- Consider appointing a deputy manager to collect data, set up each season, and administer money and quota.
- Read the rules and regulations aloud to players at the beginning of the game and before each new fishing season.
- Have a stopwatch available to time the fishing seasons.
- Use the provided [Hints](#) to guide a discussion with players at the end of each season or after the game.
- Be creative! Individualize the game by adding regulations and/or seasons. See [Season Options](#) for ideas.
- Consider utilizing player feedback in decision-making processes related to management.
- Visit [www.catchshares.edf.org](http://www.catchshares.edf.org) for additional game materials including:
  - A pre-programmed Excel file that automatically calculates how to replenish game pieces for each season and tracks trends for use in a discussion.
  - Contact information, to ask questions related to the game.

# What's the Catch?

## Fishery Background

### Scenario

*Read the following scenario aloud to fishermen.*

Fishermen have recently discovered a new stock of fan-tailed goldfish. The goldfish are plentiful and customers are clamoring to purchase them due to their delicious taste and beautiful colors. Fishermen are meeting this demand, investing their time and money to bring fan-tailed goldfish to market.

The fishery manager is responsible for ensuring a healthy, sustainable stock of goldfish and other species. The fishery manager has the authority to develop and enforce management measures, and participating fishermen must comply with the rules. The fishery manager will announce rules to fishermen at the beginning of each season.

### Time

15–60 minutes, depending on the number of seasons played and the length of discussion

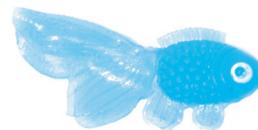
### Players

- 1–2 fishery managers
- 2–15 fishermen

### Game Set Up

1. Scatter piles of shells across the playing surface (table or floor) to create habitat.
2. Disperse all goldfish, juvenile fish, and bycatch across the playing surface. Alternatively, use 20 pieces of each per player if fewer than 15 people are playing. Feel free to group and/or scatter the fish.
3. Distribute \$10 to each player.
4. Assign gears to players or allow players to choose their gear, while ensuring a relatively even amount of each gear type is used overall. Collect payment:
  - Trawls cost \$10 each
  - Hook and line cost \$5

### Game Pieces



Goldfish  
300 pieces



Juvenile fish  
300 pieces



Bycatch  
(non-target species)  
300 pieces



Hook and line  
10 sets of chopsticks



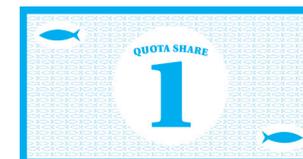
Trawl  
10 shovels



Habitat  
1 bag of shells



Money  
150 \$1 bills  
60 \$5 bills



Quota shares  
300 pieces

# What's the Catch?



## Rules of the Game

### General Rules

1. Gear must be used properly. New or additional gear can be purchased at the beginning of each season.
  - Trawls must have contact with the table at all times. Trawlers catch fish by dragging the trawl across the table and collecting everything in its path.
  - Hook and line can only catch two goldfish at a time.
2. Each landed fish is worth \$1
3. Start fishing when the manager says "GO FISH" and stop when the manager says "STOP." The fishery manager (or deputy manager) will track season length with a stopwatch.
4. Fines for rule violations:
  - \$2 fine for improper gear use
  - \$4 fine for continued fishing after the season closes
5. Fishermen must report statistics at the end of each season, including the amount of goldfish catch, juvenile catch, bycatch, and the catch value.
6. The fishery manager records the statistics and sets up the next season based on the spawning rules, described below (use programmed Excel spreadsheets for ease).

### Spawning Rules

**What's the Catch?** is a dynamic game that requires the fishery manager to replenish the fish stocks each season. The pre-programmed Excel spreadsheet (available to download at [www.catchshares.edf.org](http://www.catchshares.edf.org)) automatically calculates how many game pieces to add based on what was caught the preceding season.

The file also populates graphs showing trends in goldfish and juvenile catch, bycatch, season length, and value. These can facilitate discussion at the end of the game.

Use the following rules if calculating spawning without the programmed Excel spreadsheet (round to the nearest whole number):

- Goldfish: add  $\frac{1}{2}$  of the juvenile fish remaining
  - e.g., if 20 juveniles are left, add 10 goldfish
- Juveniles: add 1x the amount of goldfish remaining
  - e.g., if 10 goldfish are left, add 10 juveniles
- Bycatch: add  $\frac{1}{2}$  of the bycatch remaining
  - e.g., if 30 pieces of bycatch are left, add 15 bycatch

### Tip

If you do not wish to spend time counting up the pieces, simply eyeball the amount of goldfish, juvenile fish, and bycatch left on the table and replace roughly half the total amount.

# What's the Catch?



## Rules of the Game

### Season 1: No Regulations

#### Rules

- There are no catch limits.
- The fishing season will last 15 seconds.

#### Playing Season 1

- The fishery manager opens the fishing season by saying "GO FISH."
- Fishermen catch and land fish.
- After 15 seconds, the manager yells "STOP." Fishermen may land fish currently in their gear.
- Fishermen add up goldfish catch, juvenile catch, and bycatch. The fishery manager records fishery statistics in the programmed Excel spreadsheet.

### Season 2: Catch Limit

#### Rules

- Due to impacts on the goldfish population, there will now be a catch limit of half the goldfish biomass (e.g., if 100 goldfish remain, the catch limit will be 50 goldfish).
- The fishery manager will close the season when it appears fishermen have reached the catch limit.

#### Playing Season 2

- The fishery manager opens the fishing season by saying "GO FISH," and will time the season. There is no time limit.

- Fishermen catch and land fish.
- The fishery manager will close the season by yelling "STOP" when the goldfish limit has been reached. Fishermen may land fish currently in their gear. (Hint: allow them to land a little more than the catch limit).
- Fishermen add up goldfish catch, juvenile catch, and bycatch. The fishery manager records fishery statistics in the programmed Excel spreadsheet.

### Season 3: Early Season Closure

#### Rules

- The catch limit remains in place (half the goldfish biomass).
- Due to a decreasing fish population, the season will be limited to five seconds.

#### Playing Season 3

- The fishery manager opens the fishing season by saying "GO FISH."
- Fishermen catch and land fish.
- After five seconds, the manager yells "STOP." Fishermen may land fish currently in their gear.
- Fishermen add up goldfish catch, juvenile catch, and bycatch. The fishery manager records fishery statistics in the programmed Excel spreadsheet.

# What's the Catch?



## Rules of the Game

### Season 4: Catch Share Program

#### Rules

- The catch limit remains in place (half the goldfish biomass).
- All fishermen now receive “quota shares” for goldfish, which guarantee players’ access to fish.
- Allocate quota shares:
  - The total number of shares is based on the goldfish catch limit, and one fish equals one quota share.
    - e.g., if the catch limit is 16 fish, there are 16 total quota shares
  - Divide quota shares equally among fishermen.
    - e.g., if there are four fishermen, each fisherman will receive four quota shares
  - Each quota share entitles fishermen to land one fish.
  - Fishermen can buy and sell quota shares for negotiated prices.
- For every fish landed in excess of their allotted quota, fishermen must purchase shares from another fisherman. If no additional shares are available, they must “borrow” or deduct two quota shares from the next season for each fish in excess of their quota.
- There is no time limit. The season ends when fishermen have completed all transfers and landed their allotted quota shares. The fishery manager will time the season length.

### Playing Season 4

- The fishery manager opens the fishing season by saying “GO FISH” and will time the season. There is no time limit.
- Fishermen catch and land fish.
- When fishermen have finished harvesting their quota and/or completed all transfers, the fishing season is over.
- Fishermen add up goldfish catch, juvenile catch, and bycatch. The fishery manager records fishery statistics in the programmed Excel spreadsheet.

### Regulations Graph for Fishery Managers

	Season 1	Season 2	Season 3	Season 4
Goldfish Catch Limit	No	Yes	Yes	Yes
Season Length Limit	Yes	No	Yes	No
Gear Fines	Yes	Yes	Yes	Yes
Transferable Quotas	No	No	No	Yes

# What's the Catch?



## Fishery Manager Hints

### Fishery Manager Hints

The following hints can help managers guide a discussion with fishermen at the end of each season or after the game. Managers can ask fishermen to describe what happened after each season – biologically, economically, and socially – and why they were compelled to make particular fishing decisions or engage in specific actions. Between seasons, managers may also ask fishermen what could be done in future fishing seasons to address existing challenges.

### Season 1: No Regulations

- This season demonstrates the race for fish in absence of controls.
- Expect to see habitat destruction, aggression between fishermen, and high catch of goldfish, juvenile fish, and bycatch.
- One option: play twice to show the effects of multiple seasons with no regulations.

### Season 2: Catch Limit

- This season demonstrates the race for fish when players have a catch limit.
- The fishing season will likely be shorter than in Season 1.
- Landings will likely exceed the catch limit.
- Fishery managers may notice a shift in gear type from trawls to hook and line.

### Season 3: Early Season Closure

- This season demonstrates the race for fish when there are both catch and season limits.
- Landings will likely exceed the catch limit.
- Fishery managers may notice a shift in gear type from trawls to hook and line.

### Season 4: Catch Share Program

- With catch shares in place, expect the race for fish to end. The pace of the game will likely slow significantly. Fishermen may plan harvests and landings efficiently and carefully.
- Fishermen will likely comply with catch limits and avoid juvenile fish, bycatch, and habitat destruction.
- Some fishermen might choose not to fish but instead lease and/or sell quota shares to others.

# What's the Catch?



## Discussion and Season Options

### What's the Catch? Discussion

After playing **What's the Catch?**, lead a discussion about fishermen's experiences. Use the programmed Excel spreadsheets and graphs to highlight game trends.

### Suggested Discussion Questions

- What did you observe?
- What happened to goldfish and juvenile catch, bycatch, habitat impacts, and season length under different scenarios?
- If you happened to catch juveniles and bycatch or damage habitat, what drove you to do this?
- What happened to your finances after each season?
- Did you notice any cheating behaviors during the seasons?
- What were some changes you saw when the fishery implemented catch shares?
- Which scenario did you think was safer for fishermen?
- How does this relate to real life?
- In your opinion, which season demonstrated the best stewardship and conservation actions on behalf of the fishermen?

### Season Options

#### 2 Fishermen Groups

- When playing with more than 15 people, the fishery manager can split players into two groups of fishermen.
- Playing with two groups will give fishery managers the ability to observe varying behaviors among fishermen, which may improve the discussion for participants.
- The manager can also give groups different rules and see what unfolds.

#### Additional Gear Restrictions

- Additional gear restrictions can be implemented in any season except the first season.
  - Trawls must be used with the handle-side down.
  - Hook and line must be used with the player's non-dominant hand.
- Gear fines double for improper use of gear (\$4).

#### Days-at-Sea Restriction

- The days-at-sea option can be implemented in any season except the first season.
- This restriction puts a limit on the number of times fishermen can go fishing.
- A suggested limit is four trips per season by a single fisherman.
- The number of trips allowed cannot be transferred between fishermen.
- There is a \$1 penalty if a fisherman exceeds the allowed number of fishing trips in a season.

# What's the Catch?



## Season Options

### Additional Penalties for Juveniles, Bycatch, and Habitat Destruction

- These penalties can be implemented in any season and occur when fishermen land a juvenile fish, a piece of bycatch, and/or a shell.
- The fishery manager decides the penalties. The suggested amount is \$1 or \$2 per landed piece. Fishermen should pay these penalties at the end of each season.

### Bycatch Catch Limit

- A bycatch catch limit can be implemented in any season except the first season.
- The bycatch limit is  $\frac{1}{2}$  of all bycatch biomass in the fishery.
- The fishery manager will close the season when it appears fishermen have reached the bycatch limit.

### No-Take Zone

- A no-take zone can be created in any season.
- The fishery manager will designate an area of the fishery where fishing is not allowed. The fish in this area will be able to spawn without the threat of being caught by fishermen.
- The fishery manager determines the size of the no-take zone.
- Fines are imposed for violations.

### Quota Broker

- The fishery manager may ask a quota broker to participate each season. The quota broker is responsible for determining the market price of leased and traded quota.

- The quota broker also determines if a conversion factor should be implemented when fishermen trade across gear sectors.
  - e.g., one trawling quota share is equivalent to two shares of hook and line quota
- The quota broker is also responsible for collecting quota during trades between fishermen.

### Species of Concern

*Read the following scenario aloud to fishermen.*

The blue goldfish is suffering from high catch rates in the fishery and has become endangered. The fishery manager has listed it as a species of concern. The blue goldfish will be managed with a catch limit to prevent the continued decline of the population.

### Rules

- A blue goldfish catch limit can be implemented in any season except the first season.
- The number of fishermen in the fishery determines the catch limit for blue goldfish. To calculate the catch limit, multiply the number of fishermen by five.
  - e.g., when five fishermen are playing, the blue goldfish catch limit will be 25 ( $5 \times 5 = 25$ )
- The fishery manager will shut down the fishery when it appears fishermen have reached the blue goldfish catch limit.

# What's the Catch?



## Season Options

### Territorial Use Rights for Fishing (TURF)

*Read the following scenario aloud to fishermen.*

Fishermen in the community have petitioned to have secure and exclusive access to the fishing grounds off their shoreline. The government has granted this request and conferred Territorial Use Rights for Fishing, also known as TURFs. A TURF is an area-based catch share, often assigned to a community or group of individuals.

The fishery manager will divide the total fishing area into two to four equally sized TURFs, depending on the number of participants. A good rule of thumb is about four participants (community members) per area.

The fishery manager and members of each TURF will work together to determine how to best manage the fishery. The fishery manager's main concern is to avoid exceeding the catch limit. Community members will choose amongst themselves who can fish in each TURF and how to enforce controls on fishing mortality and TURF boundaries.

#### Rules

- There will be a catch limit of half the goldfish biomass.
- There is no time limit; the fishery manager will time the season length.
- When fishermen have finished harvesting and/or the catch limit has been reached, the season is over.
- Fishermen add up goldfish catch, juvenile catch, and bycatch for each TURF. Spawning rates and additional fishery restrictions affect each TURF individually.

### Multi-Species Catch Share Program

*Read the following scenario aloud to fishermen.*

Fishermen have recently discovered a market for one or more of the bycatch species. In response, fishery managers have implemented a science-based catch limit and a catch share program to maintain a healthy fishery and allow fishermen to have profitable, sustainable businesses.

#### Rules

- There will be catch limits for both goldfish and bycatch.
  - Goldfish catch limit –  $\frac{1}{2}$  of goldfish biomass
  - Bycatch catch limit –  $\frac{1}{2}$  of bycatch biomass
- All fishermen will receive separate quota shares for goldfish and bycatch, which guarantee players' access to fish. The fishery manager will allocate quota shares.
  - The total number of quota shares is based on the goldfish and bycatch catch limits.
    - e.g., if the catch limit is 16 fish, there are 16 total quota shares
  - Divide quota shares equally among fishermen.
    - e.g., if there are four fishermen, each fisherman will receive four quota shares
  - Each quota share entitles fishermen to land one fish.
  - Fishermen can buy and sell quota shares for negotiated prices.
  - Fishermen are not allowed to exceed their number of quota shares unless they purchase quota from another fisherman.
- There is no time limit. The season ends when fishermen have completed all transfers and landed their allotted quota shares. The fishery manager will time the season length.