

FishBanks, LTD.

Role Description

And Opening Scenario

Congratulations! You have just been hired to manage one of the principal fishing companies in your country. Together with the others in your company you will operate your fishing fleet each year according to policies you design to maximize your assets. The rules and information required for your success are provided below.

Criterion of Success

Your team's goal is to achieve the greatest possible assets by the end of the game. Those final assets will equal the sum of your accumulated bank balance plus the salvage value of your ships at the end of the final year in the game.

Resources

You begin the game with a fleet of ships, a bank account equal to (\$200 x number of ships), and access to two offshore fishing areas.

Decisions

Each round you must determine your fleet size by deciding whether to bid for ships at auction, make ship trades with other teams, order new ships to be constructed by the shipyard, or maintain your fleet at its current size. Then you must decide how to allocate your ships among the Coastal fishing area, the Deep Sea fishing area, and the Harbor. You will be most successful, if your decisions are based on a long-term strategy for fleet size and allocation. You must also take into account the actions of the other teams and modify your strategy accordingly.

Bank Balance:

Your bank balance is mainly increased by income from fish and ship sales,

and mainly decreased by expenses for ship purchases and operation. Interest income and expenses will also have a minor effect on your bank balance.

Your total assets at the beginning of each year equal your bank balance at the beginning of the year added to the salvage value of your ships at the beginning of that year.

Income:

You can earn income by:

- Selling your fish catch at a fixed price of \$20 per fish.
- Selling your ships to other companies at a negotiated price.
- Earning 10% interest on your minimum bank balance during years when your bank account remains positive.

Expenses:

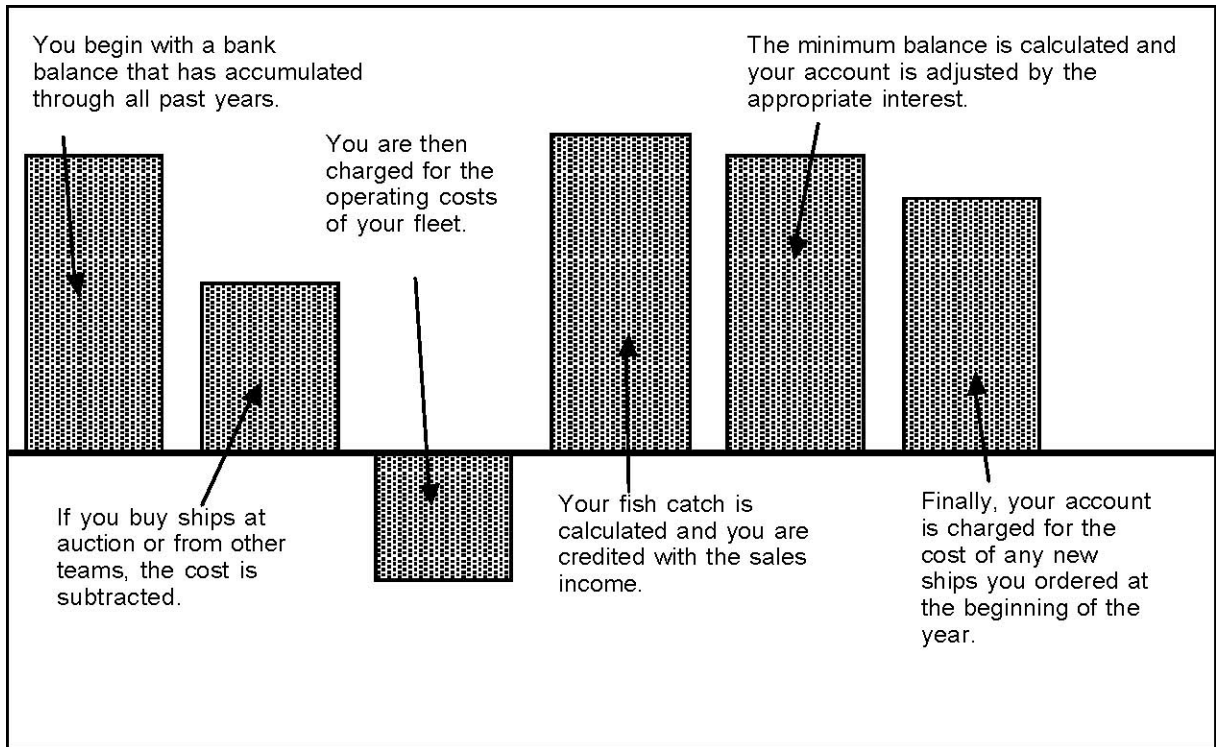
You incur expenses by:

- Buying ships at auction.
- Buying ships from other companies at a negotiated price.
- Ordering the construction of new ships at \$300 per ship.
- Operating and maintaining your ships in one or both of the two fishing areas or leaving them in the harbor
- Paying 15% interest on your minimum bank balance during years when your bank account becomes negative.

Interest:

Interest income and expenses are based on your minimum bank balance during the year. This is calculated automatically by the computer, so you do not need to do the mathematics yourself. Interest income and expenses are normally a relatively minor part of each year's profits. And the bank is willing to lend you whatever money is required to implement the decisions you make. So normally it is not worth the effort for you to calculate manually the precise value of your minimum bank balance each year.

However, if you wish to check the computer's calculations, you must keep in mind the precise sequence of credits and debits to your account.



Ships:

You may change the size of your ship fleet by buying ships at auction, negotiating with another company to buy or sell ships, and ordering new ships from the shipyard.

Ships cannot be lost or damaged. Used ships purchased in an auction or from another fishing company are as effective in fishing as new ships ordered from the factory. And the annual operating costs implicitly maintain ships in new condition. So ships do not become less effective at catching fish because of aging.

Auctions:	From time to time a fishing company in a neighboring country will go bankrupt. Its ships are then sold in one lot to the highest bidder, and they may be used immediately. Only one company can win each auction, but two or more teams could agree ahead of time to divide the ships later (during the trading session) at a negotiated price.
Trades:	During the trading session all companies are free to negotiate the purchase or sale of ships. Ships that are traded are available to the purchaser for fishing immediately. Rentals can be arranged by a prior agreement to buy ships in one year and sell them back for a lower price in a later year.
Construction:	Every year the shipyard will accept orders for new ships. These are available at a fixed price of \$300 per ship. The ships are picked up and paid for at the end of the year, and they can only be used in fishing in the next year. So there is effectively a one-year construction delay. In each year your order for new ships may not exceed half your existing fleet.
Salvage:	At the end of the game your ships will be scrapped. Their salvage value, the average value of annual profits earned by all ships in the ocean during the past two years, is included in your total assets. You may not scrap ships before the end of the game.

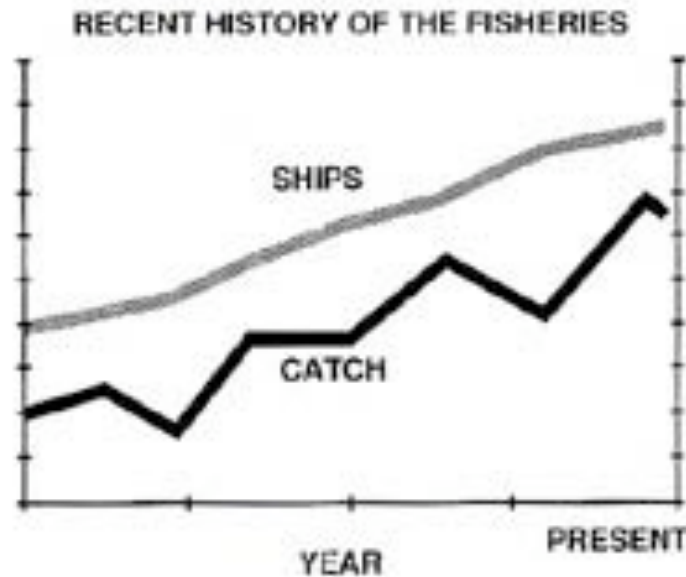
Fish:

Areas

Two fishing areas are available to you: a large Deep Sea fishery, and a smaller Coastal fishery. Biologists have estimated that the Deep Sea could potentially support between 2,000 and 4,000 fish, while the Coastal area

could support between 1,000 and 2,000 fish. Since there has been no sign of over-harvesting in the past, you are probably safe to assume that the actual populations are somewhere near these upper limits.

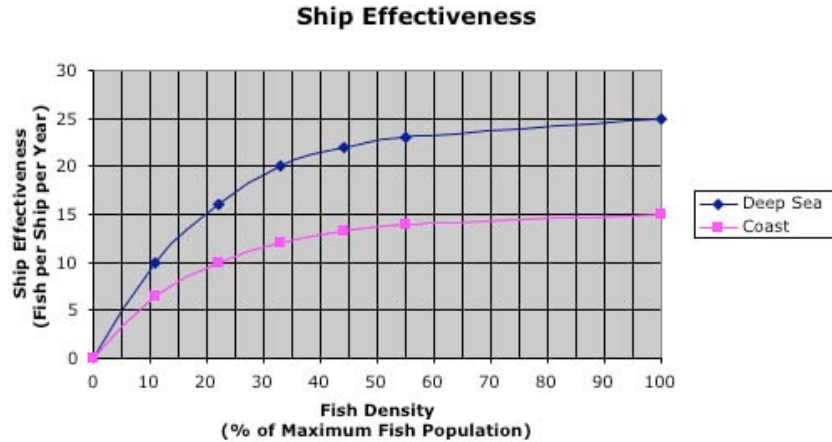
The normal yearly catch in the Deep Sea, 25 fish per ship, is higher than that in the Coastal area, 15 fish per ship. However, it costs \$250 per year to operate a ship in the Deep Sea, while in the Coastal area the cost is only \$150 per year for each ship. Operating costs remain fixed, but the catch in each area may vary according to factors explained below.



Harvest

Your total fish catch is influenced by the number of ships you send to sea, the ship effectiveness, and the weather. With good weather, catch can be as much as 20% above the catch experienced during normal weather. Bad weather may reduce catch by as much as 20%. Weather will change from year to year. But in each year it will be the same in both areas and for all teams.

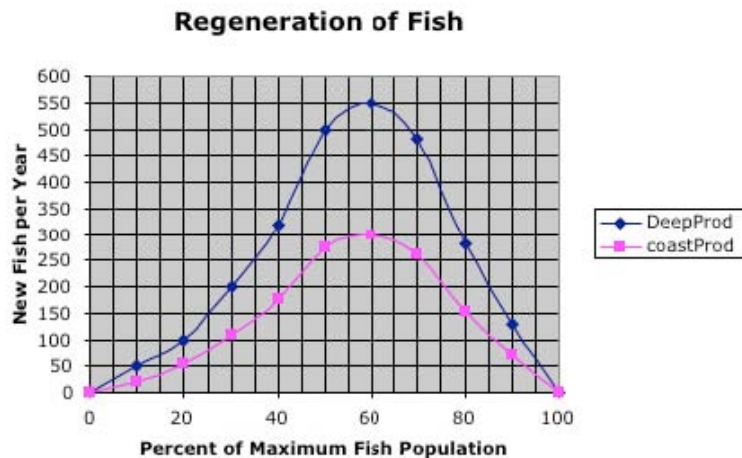
Ship effectiveness – the number of fish caught per ship each year – depends on the normal productivity of the area where the ship is operating, and on the density of fish in the area. The general relationship between fish density and ship effectiveness is shown below.



The number of ships in an area does not affect ship effectiveness; in other words, ship crowding is not a factor. Therefore it is not useful for you in any year to wait and see where the other teams are placing their ships, before you decide on your allocation. However, if many ships are sent to one area the fish population may be somewhat reduced, and the next year's harvest in that area could be affected.

Population Dynamics

The fish population is increased by natural births; it is decreased by natural deaths and by harvesting. The fertility of the fish and their lifetime are both influenced by the density of fish. The general shape of the relationship governing new fish, net additions to the fish stock each year (births – natural deaths), is shown at right.



TERMS ON THE DECISION SHEET:

Annual Report

R:1 Deep Sea Bank Catch: This is the total number of fish caught by the ships you sent to the Deep Sea fishery in the last year.

R:2 Coastal Bank Catch: This is the total number of fish caught by the ships you sent to the Coastal fishery in the last year.

R:3 Price of Fish: The price of fish is fixed at \$20 per fish caught.

R:4 Total Fish Sales: This is the product of two factors: your total catch (the sum of the R:1 and R:2 above) and the price for each fish sold (R:3).

R:5 Interest: When your minimum bank balance during the year is negative, you are charged 15% interest. This may happen even when fish sales at the end of the year leave you with a positive bank balance. If the figure for interest on your report is positive, that means your minimum bank balance during the year was positive and you earned 10% interest on the minimum balance. If the figure for interest on your report is negative, that means your minimum bank balance during the year was negative and you paid 15% interest on the minimum balance. You can calculate your bank balance yourself by adding your credits and debits in the sequence shown in the Bank Balance section of this role description.

R:6 Initial Bank Balance: In the first year this is typically \$200 per ship in your fleet. Thereafter the amount is recalculated each year by the computer program.

R:7 Ship Fleet Before Auctions and Trades: This is the number of ships you start with at the beginning of the year. It will equal D:8 in the last year plus any new ships ordered (D:7) in the last year.

Auctions, Trades, and Orders

D:1 Ships Purchased in Auction: Normally this will be zero, since auctions are not always held, and only one firm can make the highest bid. If you win the auction, record here how many ships you obtained.

D:2 Money Spent on Auction Purchases: If the term above is zero, then this will also be zero. If your team did win the auction, record here the total amount of money you paid for all the ships.

D:3 Ships Purchased in Trades: If you bought ships from one or more of

the other teams, record here the total number of ships you obtained from all other teams combined.

D:4 Money Spent on Trade Purchases: If you bought ships from one or more of the other teams, record here the total amount of money you paid to all other teams combined.

D:5 Ships Sold in Trade: If you sold some of your ships to one or more of the other teams, record here the total number of ships you provided to all other teams combined.

D:6 Money Received from Trade Sales: If you sold some of your ships to one or more of the other teams, record here the total amount of money you received from all other teams combined.

Note: you can effectively rent ships from another team by agreeing to buy a ship this year for some price and then to sell it back in the next year for a lower price.

D:7 New Ships Ordered: Here you record your decision about the number of new ships that you wish to have constructed for use in the next year. These cost you \$300 each, but you can borrow the money from the bank if your bank balance is inadequate to finance your desired purchases. You may not order more than 50% of your existing fleet in any year (indicated by D8). If D8 is an odd number – 1, 3, 5, etc. – the computer rounds that number up to the next higher even number to determine your maximum possible order for new ships.

Ship Allocations

D:8 Ship Fleet After Auctions & Trades: This is the number of ships you have for use in fishing this year. It equals $R:7 + D:1 + D:3 - D:5$. It is not influenced by your decision regarding D:7, New Ships Ordered. These ships only become available to you at the beginning of next year.

D:9 Ships Sent to Deep Sea Bank: Each ship sent to the Deep Sea fishery costs you \$250 in operating costs per year. This money may be borrowed from the bank, if the total operating costs exceed your bank balance. Operating costs are removed from your bank at the beginning of each year.

D:10 Ships Sent to Coastal Bank: Each ship sent to the Coastal fishery costs you \$150 in operating costs per year. This money may be borrowed from the bank, if the total operating costs exceed your bank balance.

D:11 Ships Remaining in Harbor: Each ship left in the harbor costs \$50 in operating costs per year.

Fish Banks Quick Reference Sheet:

Fishing Areas:

	Deep Sea	Coastal	Harbor
Operating Cost:(per ship per year)	\$250	\$150	\$50
Normal Yield (fish per ship per year)	25	15	0
Estimated maximum fish population	2000-4000	1000-2000	0

Ship Purchases:

	Availability	Cost
Purchase in auction	Immediate	Highest bid
Purchase in trade session	Immediate	Negotiated price
Order from shipyard	One year delay	\$300

Sample Season:

Team #1 starts the year with 12 ships and a bank balance of \$2400. Weather = 1.03. Order for new ships to be constructed is 1.

Transaction	Income	Expenses	Bank Balance
Initial bank balance			\$2400
Buy 4 ships at auction		\$1200	\$1200
Sell 2 ships in trade @ \$350 ea.	\$700		1900
Operate 8 ships in Deep Sea		\$2000	-\$100
Operate 6 ships in Coast		\$900	-\$1000
Sell fish from Deep Sea	\$4120		\$3120
Sell fish from Coast	\$1860		\$4980
Pay interest on minimum bank balance (-\$1000)		\$150	\$4830
Pay for new ship ordered		\$300	\$4530
Final bank balance			\$4530