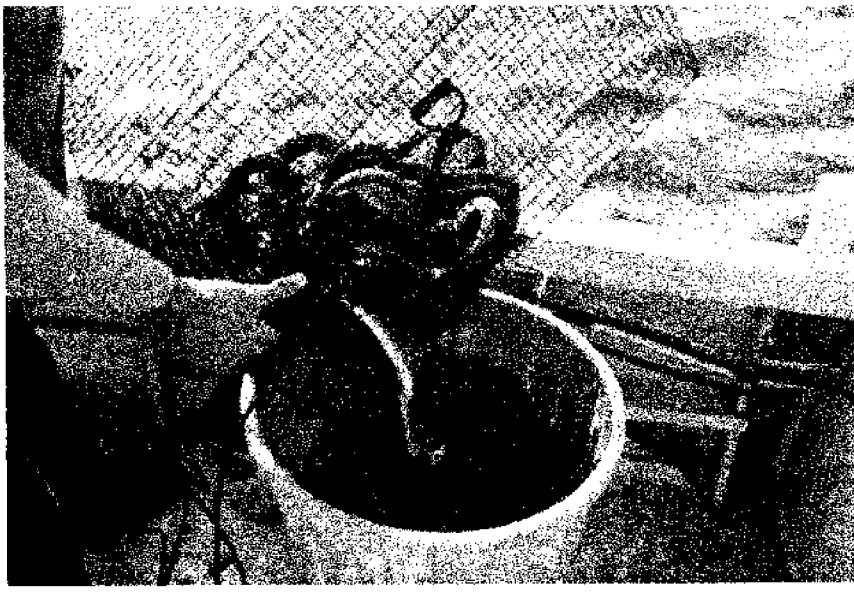
To eel or not to eel:

an economic analysis of a part-time eel fishing enterprise



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"TO EEL OR NOT TO EEL"

AN ECONOMIC ANALYSIS OF A PART-TIME EEL FISHING ENTERPRISE

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Eel harvesting can be a profitable way to add to the family income by using leisure time. However, before the decision to enter the eel fishery is made, some time with paper and a sharp pencil analyzing the proposed plan could result in a much better decision.

Recent favorable prices and publicity have generated considerable interest in the developing eel fishery of North Carolina and the other coastal southeastern states. This analysis is intended to provide basic information on the fishery and to serve as a useful framework in deciding whether to enter the eel fishery. While the data used in this analysis are based on the experiences and observations of eel fishermen in the central and northern regions of coastal North Carolina, it is applicable to other regions. It is reasonable to expect that your individual costs and receipts will differ from those stated here. Attached to the back of this manual are work sheets which you can use to analyze your planned or operating eel fishing enterprise.

Eel fishing as it is commonly practiced involves capturing live eels and selling them to a buyer for export to Europe or Japan for human consumption. To fish for eels, pots (cylindrical or rectangular containers made of wire mesh) are placed on estuary and river bottoms where eels are thought to be. Prior to placement, bait such as fresh fish or shrimp heads is placed inside the pot. Eels enter but, due to the pot construction, cannot leave. The pots are emptied each day; the eels are placed in a holding pen until sold and picked up by a buyer.

Investment

To enter the eel fishery, you need to acquire equipment such as a truck, boat, eel pots and a holding pen. It is assumed that the truck, boat, motor and trailer are purchased "used" and that the fisherman purchases the rectangular eel pots and constructs the holding pen. A charge for labor is included in the cost of the holding pen. As an example of how to compute costs and receipts a 50-pot operation is analyzed. The investment required is listed below.

Work boat (16'), motor (25 hp), trailer	$3,000
Pickup truck[1]	2,000
50 rectangular eel pots @ $22.00[2]	1,100
Holding pen (4' x 4' x 8')[3]	160
Home freezer	250
Misc. (dip net, pails, rope, grappling hook, etc)	70
Depth finder	150
	$6,730

When the investment is estimated, it is necessary to examine annual costs. Annual costs are divided between ownership and operating costs; each cost is considered below.

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[1]The use of the pickup truck is assumed to be divided equally between the fishing business and other activities. In this example, $4,000 is paid for the used truck; therefore, $2,000 is recorded as the investment.

[2]The approximate cost of purchased square pots.

[3]The cost of the holding pen combines the charge for labor and cost material.

Ownership costs

Ownership costs are those costs which are incurred whether or not fishing is done. While insurance is an ownerhsip cost, it has been observed that few fishermen purchase insurance on the fishing equipment, however, insurance must be carried on the truck. Depreciation[4] is the largest single item of ownership cost. Interest on the investment in fishing gear and equipment is included as a cost. Although the money may not be borrowed to enter the fishery, it could be used to produce income by investing in other enterprises. Therefore, an interest charge is included.

Depreciation	
Boat, motor, trailer (5 yr. life)	$ 600
Pickup truck (5 yr. life)[5]	400
Freezer (5 yr. life)	50
Depth finder (5 yr. life)	30
Holding pen (4 yr. life)	40
Eel pots (50), (3 yr. life)	367
Taxes and insurance: 3% of investment[6]	202
Licenses	25
TOTAL ANNUAL OWNERSHIP COST	$1,714

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[4]Depreciation is a technique for spreading the cost of an asset over the years in which it is used. In this way depreciation becomes an expense. The amount of depreciation charged depends upon the loss of value as the asset is used. This example uses straight line depreciation with no salvage value. For example, the holding pen has a current market value of $160 and a 4 year life. Therefore, $160 ÷ 4 years results in a loss in value of $40 per year.

[5]It is assumed the use of the pickup truck is divided equally between the fishing business and other activities. Therefore, one half of $4,000 or $2,000 is the basic asset value for depreciation.

[6]Property taxes and insurance are estimated at 3% of investment. This amount will differ among fishing enterprises.

Operating Costs

Costs are incurred when fishing. Those costs due to actually fishing are called operating costs. It is assumed that the fisherman will fish 13 weeks in the spring and 13 weeks in the fall for a total of 26 weeks per year and will hire no additional labor. The actual amount of days fished will vary due to weather, catch rate, price and other related factors.

Vehicle: 3650 miles x \$18.5¢ mile[7]	\$ 675
Boat operation: gas and oil	1,474
Boat, motor and trailer maintenance	100
Pot maintenance and replacement	250
Bait: 9,100 lbs. x \$.15/lb (1 lb/pot/day)	1,365
Electricity (freezer)	50
TOTAL ANNUAL OPERATING COSTS	\$3,914

Receipts

It is estimated that an average of two pounds of eels will be captured in each pot each day. The price of eels at the holding site has been around \$1.00 a pound. Using these estimates, the 50-pot enterprise would generate 18,200 pounds of eels. This is assuming 26 weeks of fishing at 7 days per week, averaging 6 hours of work per day. If each pot captures an average of 2 pounds per day, and these eels are sold for \$1.00 per pound, total receipts will be \$18,200.

TOTAL RECEIPTS	\$18,200

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[7]Currently, the standard mileage rate for tax purposes is 18 1/2¢/mile for the first 15,000 miles and 10¢/mile for each additional business mile. Alternatively, actual costs of vehicle operation may be used.

As stated in the summary table below, subtracting total cost from total receipts gives the net return to the fishermen. The net return is used to obtain two important quantities: 1) the amount earned by labor and management, and 2) the amount the investment earned. To determine the return to labor and management: the amount the investment could have earned in another use is subtracted from the net return. To determine the return to investment: the cost of operator labor and management of the fishing enterprise are subtracted from the net return. Operator labor is charged at $3.50 per hour[8] to operate the fishing enterprise, (49 hours/week). The cost of management is assumed to be 7% of total receipts, in this example, the cost is $1,274.

Summary Table: Computing net returns

(1)	Total receipts	$18,200
(2)	Total cost = operating cost + ownership cost	5,628
(3)	Net return or return to labor, management, and investment: (1)-(2)	12,572
(4)	Return to labor and management: $12,552 - (12% x $6,730 investment)	11,744
(5)	Return to investment: $12,552 - ($3.50 x 1092 hrs. labor) - (.07 x $18,200)[9]	7,456

Break-even analysis

In calculating the break-even catch and break-even price, operating cost and ownership cost are added together. This is necessary when the initial investment decision is being made, which is the situation assumed in the example. The break-even

[8]Use a wage rate which best reflects your earnings if you were not fishing but working elsewhere.

[9]Management costs are assumed to be 7% of total receipts. In this example: 7% x $18,200 = $1,274.

catch is the poundage of eels sold from which the receipts would just cover total costs. It is calculated by dividing total costs by price per pound of eels. Fishing 50 eel pots, as in this example, the break-even catch would be 5,628 pounds of eels for the 26 weeks or an average of 31 pounds of eels landed each day or 217 lbs per week.

$$\frac{\$5,628}{1.00/1b} = 5,628 \text{ lbs of eels (break-even catch of eels)}$$

The break-even price at which eels can be sold is calculated by dividing total cost by the total expected catch in pounds. The break-even price (assuming a catch of 2 lbs. per pot per day, or 18,200 pounds for the 26 weeks) is $.31 per lb. This is the price at which total receipts would just cover total costs.

$$\frac{\$6,628}{18,200 \text{ lb}} = 31¢/1b \quad \text{(break-even price)}$$

Summary

The analysis above assumes that 50 pots are fished each day; however, you may wish to fish other than 50 pots. The table below presents the estimated results of fishing 10, 25, 50, 75 and 100 pots.

Pots fished	Receipts	Total costs	Net returns	Return to labor& mgt.	Return to investment
10	$ 3,640	$3,320	$ -320	$-1,020	$-1,450
25	9,100	4,223	4,877	4,138	2,227
50	18,200	5,648	12,552	11,744	7,456
75	27,300	7,543	19,757	18,738	12,071
100	36,400	9,257	27,143	26,050	16,895

The results indicate that returns increase as more pots are fished. Fishing 10 pots results in negative returns; fishing 25 pots results in positive returns. Part-time eel fishing uses time in addition to the time required for "full-time employment". Therefore, the choice as to the number of pots fished may be limited by the time available to fish. Eeling may be suitable for persons looking for a fishery to fit between other fisheries.

The results of the analysis indicate that returns from eel fishing can be profitable if enough pots are fished. The break-even information indicates that by fishing 50 pots, at least 34.15 pounds of eels would have to be caught each day (as an average) to break even at $1.00 per pound. Also, the price of eels could fall from the current $1.00 to $.31 per pound assuming 100 pounds of eels were caught each day, before the break-even price would be reached. This observation suggests that either price or catch could fall considerably before losses are experienced.

Marketing

Captured eels are usually held live in floating pens until sold. Currently, several firms operate tank trucks on a regular basis through areas of North Carolina where eel fishing is done. To sell your eels, contact other fishermen and/or a University of North Carolina Sea Grant marine advisory agent to obtain the names of firms buying eels in your area. The eels are removed from the holding pen, weighed, and payment made by the buyer at the holding site. It is advisable for you to check with several buyers on current prices.

Capturing eels in pots and managing the fishing enterprise requires considerable skill and hard work. Before investing in eel fishing equipment, you should visit with other eel fishermen and contact your marine advisory agent for additional information. These advisory agents are located in each of the three North Carolina Marine Resources Centers:

a) Marine Resources Center/Ft. Fisher
General Delivery
Kure Beach, North Carolina 28449
Telephone: (919)458-5498

b) Marine Resources Center/Bogue Banks
P.O. Box 896
Atlantic Beach, North Carolina 28512
Telephone: (919)726-0125

c) Marine Resources Center/Roanoke Island
P.O. Box 699
Manteo, North Carolina 27954
Telephone: (919)473-3937
473-5441

To help you analyze your present or projected eel fishing enterprise, work sheets are included on the following pages. Follow the computations of the examples in this brochure, but use prices and costs which reflect your own situation. Your numbers will differ from those in the example. Completing the work sheet will give you the net returns of your present or planned eel fishing enterprise.

EEL FISHING ENTERPRISE WORK SHEET

To analyze your present or planned eel fishing enterprise, fill in the blanks and follow the instructions. The procedure below is the same as the procedure followed in the example on page two.

INVESTMENT

Item	Value
Boat	$_____
Motor	_____
Trailer	_____
Truck	_____
Pots: number of pots x cost per pot	_____
Holding pen	_____
Home freezer	_____
Miscellaneous	_____
Depth finder	_____
_____	_____
_____	_____
_____	_____
_____	_____
(1) Add for total investment:	$_____

OWNERSHIP COSTS

(See page 3 for example)

Depreciation[1]	Value
Boat, motor, trailer: (__ year life)	$_____
Truck (____year life)	_____
Freezer (___year life)	_____
Depth finder (___year life)	_____
Holding pen (___year life)	_____
Eel pots (____year life)	_____
_____ (___year life)	_____
_____ (___year life)	_____
Taxes and insurance (Vehicle, boat, etc.)	_____
Fishing license	_____
_____	_____
_____	_____
_____	_____
(2) Add for total ownership cost	$_____

[1]To determine the annual depreciation, divide the current market value by the expected lifetime of the asset in years. For example: $1000 boat with a 5-year lifetime has an annual depreciation of $200, assuming no salvage value.

[1]Choose an interest rate which best reflects the return from the funds if they were not invested in the fishing enterprise but invested elsewhere.

OPERATING COSTS

(See page 4 for example)

	VALUE
Vehicle: miles driven x cost per mile	$ _____
Boat and motor operation: gas, oil, etc.	_____
Boat, motor and trailer maintenance	_____
Pot maintenance and replacement	_____
Bait: Cost per pound x pounds required	_____
Electricity: freezer	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
(3) Add for total operating cost	$ _____

LABOR REQUIREMENT

(4) Number of hours per week intended to fish _____ hrs. per week

(5) Number of hours per year intended to fish: line (4) x weeks per year of fishing _____ hrs. per year

(6) Line 5 x your wage rate $ _____

RECEIPTS

(See page 5 for example)

Price per pound of eels x estimated total poundage of eels sold = total receipts.

(7) _____ X _____ = $_____
(price) (pounds) (total receipts)

SUMMARY

(8)	Total receipts (from line 6)	$_____
(9)	Total cost (line 2 + line 3)	_____
(10)	Net return or return to labor management and investment (line 7 - line 8)	_____
(11)	Return to labor and management (line 9 - interest rate x line 1)	_____
(12)	Return to investment (line 8-(line 6 + .07 of line 8)	_____
(13)	Break-even catch per year (line 9 ÷ price per pound of eels)	_____
(14)	Break-even price (line 9 ÷ estimated catch per year in pounds (from line 7)	$ _____

This completes the analysis of your present or planned eel fishing enterprise. If you would like additional information, contact the UNC Sea Grant advisory agents at your nearest N.C. Marine Resources Center or call Sea Grant in Raleigh at 919/737-2454. Related publications are also available from Sea Grant, 105, 1911 Building, Raleigh, North Carolina 27650.