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MARINE RECREATIONAL FISHING IN RHODE ISLAND
FEBRUARY AND MARCH, 1978

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I. Introduction

This research report is the first in a series of reports on a survey of marine recreational fishing in Rhode Island. This survey is the basis of a three-year study of recreational fishing in Rhode Island supported by the Sea Grant program at the University of Rhode Island and by the National Marine Fisheries Service. The project received its impetus from the passage of the Fishery Conservation and Management Act of 1976, which requires that the Department of Commerce, through the regional councils, manage fishery stocks optimally for their recreational as well as their commercial yield. This requirement, as well as the growing competition between commercial and recreational fishing for some species, emphasizes the importance of collecting economic and biological statistics for recreational fishing.

This project is designed to satisfy the needs for information on recreational fishing in several ways. First, it will test and validate a methodology developed for collecting recreational fishing statistics for the National Marine Fisheries Service. Second, it will estimate for a one-year period basic sports fishing parameters, including participation, economic expenditures, catch, and effort by species for finfishing and shellfishing in Rhode Island waters by Rhode Island households. Third, it will develop empirical estimates of the net economic value of fishing for different species in Rhode Island waters. This paper reports basic sports fishing parameters for February and March, 1978, the first two-month period of the survey.

The survey, which runs from February, 1978, to January 31, 1979, is composed of two parts. The first, the field survey, intercepts fishermen in Rhode Island waters. On the field survey, interviewers weigh and measure fish caught by fishermen, and ask the fishermen a variety of social and economic questions. The field survey is being managed at the University of

Rhode Island. The other part of the survey, the telephone survey, makes calls to a random sample of Rhode Island households. The telephone survey determines participation in saltwater fishing by Rhode Island households, and number and place of fishing trips by households that fish. The telephone survey is being managed under contract to Human Sciences Research, Inc., of Maclean, Virginia. A complete description of the methodology of both surveys will be forthcoming in a separate report. The purpose of this report is to provide some provisional estimates of sports fishing parameters for the first two months of the survey.

In the following section, two types of statistics are provided. First are expanded estimates of aggregate sports fishing parameters for Rhode Island. The second set of statistics are measures of central tendency of characteristics of sampled fishermen in Rhode Island. All statistics are provisional, subject to revision.

II. Aggregate Catch and Effort Data for February and March, 1978

The results reported below are based on field interviews conducted in February and March and on the telephone survey conducted from March 29 to April 5.* In the field survey, 137 fishermen were interviewed. Of those, 84 were from Rhode Island and 53 were from outside Rhode Island. From the telephone survey, 935 households were contacted. Of those 935 households, 10 engaged in finfishing during February and March, and made a total of 32 finfishing trips.

Table 1 represents provisional catch and effort statistics for fishermen residing in Rhode Island and fishing in Rhode Island waters. The

*The details of the telephone survey are available in Progress Report No. 1 by Human Sciences Research (HSR, 1978). For a copy of this report, write to the authors at the University of Rhode Island.

TABLE 1
CATCH AND EFFORT STATISTICS FOR FINFISHING IN RHODE ISLAND BY
RHODE ISLAND HOUSEHOLDS, FEBRUARY AND MARCH, 1978*

Variable	Estimated Value	Standard Error	95% Confidence Interval	
Participation Rate (p)	.0107	.0034	.004	.017
Trips per Participating Household (t)	3.2000	.8570	1.420	4.880
Total Participating Households** (P)	3,285.0000	1,033.0000	1,260.000	5,310.000
Total Trips (T)	10,512.0000	4,431.0000	1,827.000	19,197.000
Catch per Trip Numbers of Fish (x)	1.6200	.2860	1.060	2.180
Total Catch Numbers of Fish (X)	17,029.0000	7,885.0000	1,574.000	32,484.000

*Based on telephone sample of 935 households and a field sample of 84 Rhode Island fishermen.

**Based on an estimate of 307,000 households in Rhode Island in 1975 (U.S. Bureau of the Census, 1975).

appendix describes in brief how each number and its standard error is computed. The participation rate is the proportion of Rhode Island households having at least one saltwater fishing trip during February and March. The estimate is .0107; naturally quite low for February and March, because the weather is inhospitable to fishermen. The mean number of trips per participating household was 3.2. Total participating households for Rhode Island were estimated at 3,285, which is 1.07% of the estimated 307,000 households. Total trips for the two-month period, by Rhode Islanders in Rhode Island, were estimated at 10,512. When multiplied by the catch per trip of 1.62 fish, we compute 17,029 fish caught by Rhode Island households in Rhode Island waters for the period February and March, 1978.

The reader may judge the sampling reliability of the estimates by looking at the 95% confidence intervals for the estimates, given in the last two columns of Table 1. While the variations may appear large—for example, 95% of such sampling schemes would give us total trips between 1,827 and 19,197—it is encouraging that all of the confidence intervals exclude zero. The sampling precision of the estimates will improve for periods of better weather and hence higher participation.

The principal species caught during February and March were cod and winter flounder. The aggregate estimates for these two species are given in Table 2, where figures on catch per trip in numbers, weight per fish, and total numbers and weight are given. In examining Table 2, the reader should bear in mind two important considerations. First, the total numbers and weight of cod and winter flounder are for Rhode Islanders fishing in Rhode Island waters; the estimates of the totals do not include fish caught by out-of-state fishermen. Second, these catch per trip figures, and hence the estimates of the totals, are based on a catch per trip estimate which is

TABLE 2

CATCH BY SPECIES FOR RHODE ISLAND HOUSEHOLDS IN RHODE ISLAND

MARINE WATERS: FEBRUARY AND MARCH, 1978

	Winter Flounder			
	Estimated Value	Standard Error	95% Confidence Interval	
Catch per Trip	1.380	.2830	.8250	1.9300
Mean Weight/Fish*(kg)	.454	.0360	.3820	.5260
Total Catch				
Numbers	14,506.000	6,915.0000	953.0000	28,059.0000
Weight	6,586.000	3,192.0000	329.0000	12,842.0000
	Cod			
	Estimated Value	Standard Error	95% Confidence Interval	
Catch per Trip	.233	.0876	.0518	.3952
Mean Weight/Fish*(kg)	3.100	.2790	2.5530	3.6470
Total Catch				
Numbers	2,344.000	1,405.0000	-410.0000	5,099.0000
Weight	7,267.000	4,423.0000	-1,402.0000	15,935.0000

*Mean weights estimated on the basis of 61 winter flounder and 16 cod.

computed by dividing total fish caught by total number of trips, regardless of where the trips are taken. As a consequence, the 95% confidence intervals are large, including zero for weight and numbers of cod. Thus, we estimate the total number of cod caught by Rhode Islanders fishing in Rhode Island at 2,344 and the total number of winter flounder at 14,506. The sampling precision of our estimates by species will be greatly improved as participation and sampling effort increase in the summer months.

III. Descriptive Statistics for Fishermen

Tables 3 and 4 present some basic descriptive statistics for Rhode Islanders and non-Rhode Islanders fishing in Rhode Island waters in February and March 1978. These tables show that out-of-staters travel further, spend more, and are more successful than Rhode Islanders. The reasons for the more travel and expenditures are obvious. However, the difference in the catch per unit effort takes some explaining. If the cost per trip in terms of time and expense is small, then a fisherman may be willing to try fishing just for the sake of being outdoors. However, if the cost is high, then the fisherman will have more incentive to go to the right place at the right time. Additionally, a large portion of the non-Rhode Islanders fished on party boats during this period, and fishing on party boats tends to produce high catch rates. Thus out-of-staters experience a higher catch rate (1.02) than Rhode Islanders (.66).

Tables 3 and 4 provide a minimal amount of economic data. We see that mean family incomes of all fishermen are in the neighborhood of \$17-18,000. The cost per trip figures are conservative, representing simply what the fishermen perceived as the outlay required per trip, and not all expenditures associated with the trip. A substantial part of the future work on this

TABLE 3

OUT-OF-STATE SALTWATER FISHERMEN IN RHODE ISLAND WATERS

Variable	Mean	Standard Error
One-Way Distance Traveled per Trip (miles)	92.10	11.20
Age	39.80	1.98
Cost per Trip	\$16.03	2.59
Years Fished	17.60	1.73
Income	\$17,600.00	1,470.00
Fish Caught per Trip	1.02	.26

TABLE 4

RHODE ISLAND SALTWATER FISHERMEN IN RHODE ISLAND WATERS

Variable	Mean	Standard Error
One-Way Distance Traveled per Trip (miles)	17.90	1.50
Age	31.90	1.60
Cost per Trip	\$5.31	.76
Years Fished	14.10	1.34
Income	\$17,300.00	1,270.00
Fish Caught per Trip	.66	.17

project will involve economic analysis, but it should be emphasized that the cost per trip figures bear no necessary relation to the economic value of sports fishing in Rhode Island.

IV. Conclusion

This report has presented the first set of provisional estimates of sports fishing parameters for Rhode Island in February and March, 1978. It will be followed by reports for other periods, as well as extended analyses of the sampling methodology and economics of marine sports fishing.

References

- Human Sciences Research, 1978. A telephone survey in Rhode Island to collect marine recreational fishing statistics in 1978-1979. Progress Report No. 1, April, 1978.
- U.S. Department of Commerce, Bureau of the Census, 1977. Population Estimates and Projections. Series P-25, No. 687.

APPENDIX

DEFINITIONS AND COMPUTING PROCEDURES

1. Participation Rate:

p = participation rate = proportion of Rhode Island households having at least one finfishing trip in previous two months; estimated directly from telephone survey.

Variance of Participation Rate:

$$V(p) = \frac{p(1-p)}{n_1}$$

where $n_1 = 935$ = number of households contacted on phone survey.

[$V(.)$ notation denotes variance of $(.)$.]

2. Trips per Participating Households:

t = mean trips per participating household.

Variance of Trips per Participating Households:

$$V(t) = s^2/(n_2-1)$$

where $n_2 = 10$ = number of participating households, and

s = standard deviation of trips per participating household, computed from phone survey.

3. Total Number of Participating Households:

P = total number of participating households in Rhode Island = Hp

where H is number of households in Rhode Island, as given by Census data.

Variance of Total Participating Households:

$$V(P) = V(Hp) = H^2V(p).$$

4. Total Trips by Rhode Island Households:

T = total trips = Pt .

Variance of Total Trips by Rhode Island Households:

$$V(T) = V(Pt) = V(P)V(t) + t^2V(P) + P^2V(t)$$

assuming P and t are distributed independently.

5. Total Catch in Numbers of Fish, by Rhode Island Households:

Total Catch, in numbers = $X = (\text{catch per trip}) (\text{total trips}) = xT$

where x = mean catch per trip by Rhode Island fishermen; estimated from field survey.

Variance of Total Catch:

$$V(X) = V(xT) = V(x)V(T) + T^2V(x) + x^2V(T)$$

assuming T and x to be distributed independently.

6. Total Catch in Weight of Fish, by Rhode Island Households:

Total Catch, in weight = $W = (\text{weight of catch per trip}) (\text{total trips}) = wT$

where w = mean weight of catch per trip by Rhode Island households; estimated from field survey.

Variance of Total Weight:

$$V(W) = V(xT) = V(w)V(T) + T^2V(w) + w^2V(T)$$

assuming x and T to be distributed independently.

For calculating number and weight of catch by species, the mean number of catch for species i (x_i) and the mean weight of catch for species i (w_i) are substituted for x and w , respectively.