In conclusion, attention should be given to the watershed projects being installed under Public Law 566, for the program is just now being implemented across the country. Opportunities will be available for fish and wildlife management programs. Early planning and educational programs are essential to minimize difficulties in establishing good management programs. Lessons may be learned from studies of these impoundments which may be applicable to future impoundments of 50-100 surface acres.

A METHOD FOR EVALUATING FRESH WATER SPORT FISHING UTILIZATION

By JIM COUNSELMAN Florida Game and Fresh Water Fish Commission Tallahassee, Florida

The state of Florida is currently engaged in formulating water use laws through the Water Resources Study Commission. In April of 1956, this study commission requested the Game and Fresh Water Fish Commission to furnish them an evaluation of surface water utilization by June 30, 1956.

Obviously, a short cut method of evaluating the sport fishery would have to be developed to meet the deadline, and still be reasonably accurate. The purpose of this paper is to describe this short cut method which varied four per cent with the Crossley survey results for Florida recently announced in Toronto, Canada.

There are a number of long term methods of evaluation employed by various states which are satisfactory. This short cut method is not intended to distract from the value of long term surveys anytime a state has the money, facilities, and time to conduct such studies. In instances where the time factor is not afforded then this method can be effectively used as a stop-gap tool.

The original work as presented to the Water Resources Study Commission included all phases of recreational and commercial utilization of fresh water that the Game and Fresh Water Fish Commission has jurisdiction over. However, this paper covers only fresh water fishing. It is felt that monetary values contained in the original report would be of only passing interest, whereas, the methods employed to derive these values may be helpful to some workers.

Some time elapsed before the following plan was formulated and the writer recovered from the shock of what appeared to be an unsurmountable problem to be completed in a seemingly ridiculously short time.

Letters were written to various manufacturers and organizations; the results of these letters were most gratifying and are the key to this short cut method. It is believed the contained bibliography should be of great value to many workers.

For instance, the Outboard Boating Club of America ¹⁶ furnished an almost unbelievable amount of detailed statistical data. Such things as, consumer purchases of outboard motors and boats, who they are (occupation), what they buy (boats, motors, or both), reasons for buying (fishing, cruising, hunting, skiing, etc.), and how many units of major equipment they own. The Outboard Boating Club of America even furnished a breakdown of outboard motor purchases for each county in Florida.

The figures in the following example were furnished by the Outboard Boating Club of America, and are for the nation as a whole. Florida figures, though available, are not given here.

HORSEPOWER OF OUTBOARD MOTORS PURCHASED IN 1953-55

	Horsepower Size			
	0.0	7.1	12.0	Average
Year	7.0	12.0	Up	Horsepower
1953	46%	33%	21%	9.0
1954	42%	34%	24%	10.3
1955	31%	32%	29%	12.9

The average size or horsepower of outboard motors sold in 1955 is important in this method of evaluation because a great deal of emphasis is placed upon depreciation costs.

Another source of recreation boating statistics is H. A. Bruno and Associates of the National Association of Engine and Boat Manufacturers.¹⁵ This organization furnished data on such items as gallons of gasoline and oil consumed in outboard motors in 1955, and a host of other data.

It is extremely difficult to list bibliographical references in any order of importance. In fact this paper could contain nothing but references with a short description and be very voluminous. However, the Department of Commerce publication on population census ²⁰ certainly deserves mention. This publication gives an almost infinitesimal breakdown of the population, per capita earning, labor force, education and many other pertinent facts. An example of the application of these statistics can be found in Section 1.

In short, there are many organizations and agencies that collect and compile information of paramount interest to many workers. This information is available for the asking in many cases, and very nominal costs in others. When data from these various organizations are correlated or interpolated with existing data from the fish and game agencies a surprisingly complete picture is attainable.

The following problems are the key to monetary evaluations and a brief explanation of how each was solved will be given.

- 1. Number of Fishermen.
- 2. Number of Fishermen Owning Major Equipment, *i. e.*, Boats, Motors, and Trailers.
- 3. Cost of Owning Equipment.
- 4. Cost Per Fisherman Day.
- 5. Number of Annual Fisherman Trips.

1. Number of Fishermen

Through license sales, the number of licensed fishermen presented no problem, but Florida's license system excludes resident children under 15 years of age, resident adults over 65 years of age, and residents may fish in their home counties with as many as three cane poles. In that no official estimate was available, the number of "free" fishermen was calculated with the aid of population statistics, and was purposely estimated in a conservative manner. For instance, in the category of children under 15 years, the fishing group was considered to be 10-14 years old. This category was further restricted to only 50 per cent of the boys, and of the 118,000 boys 10-14 years old in Florida, only 59,000 were considered to be steady fishermen.

In the category of residents over 65 years of age, only the age group 65-69 was used, and again the females were excluded. Of the 56,000 men in Florida over 65, only 19,000 or one-third were considered to be consistent fishermen.

The cane pole fishing group was considered to be made up predominantly of non-white females in the age group of 20-55. In 1955, there were 190,000 non-white females 20-55 years of age in Florida, and they were considered to represent the number of cane pole fishermen.

This method correlates well with the results of a localized check of licensed to unlicensed fishermen that was conducted prior to the writing of the surface water utilization report.

2. Number of Fishermen Owning Major Equipment

Current studies being conducted by the Florida Game and Fresh Water Fish Commission were analyzed and it was found that 30 per cent of the fishermen owned their own boats and motors, 34 per cent own their motors, and 36 per cent rent boats and motors. Outboard Boating Club of America data for the entire nation in the occupational group that purchased the most major equipment gave 36 per cent owning boats and motors, 34 per cent owning motors only, and 30 per cent rent equipment. These percentages (Florida data) were applied to only licensed fishermen.

3. Cost of Owning Equipment

It is difficult to arrive at an "average" amount to represent the cost of equipment, particularly boats; anything that floats is a fishing boat, be it an Indian dugout or a 125-foot yacht.

A. Boats and Trailers. As a result of conversations with boat owners, dealers, fish camp operators, marinas operators, etc., an average size and cost per boat was determined.

Boat and trailer depreciation was calculated on a basis of 15 years with the

following formula: $D = \frac{C}{V}$ in which D = depreciation per year, C = cost

of boat, trailer, or both, and Y = years of ownership.⁽¹⁵⁾

Maintenance of boats and trailers depend upon a great many factors such as usage, particularly in salt water, the original quality of the equipment, etc. It was determined that the average maintenance costs for boats and trailers were \$6.25 per month or \$75.00 per year in Florida. This, of course, assumes no major accident in launching, retrieving, or transporting.

B. Outboard Motors. According to Outboard Boating Club of America data the average outboard motor in use in 1955 was 12.9 horsepower.

Annual depreciation rates on outboard motors were based on figures from the 1955 edition of Price Guide of Used Outboard Motors.²² Outboard motors, like automobiles, depreciate heavily the first two years. Although technological advances make a three-year-old motor somewhat obsolete, this was the age of the motors used for depreciation calculations; another thing, this is the age group most commonly traded-in. The most commonly available horsepower size approximating the national average of 12.9 was a 15 horsepower outboard motor, and this size was used for depreciation calculations. The following

formula $D = \frac{C-V}{V}$ in which D = depreciation per year, = cost of 15 horse-

power outboard motor purchased in 1953, V = average trade-in value, and Y = years of ownership. $^{(3)}$

Maintenance costs of a well cared for outboard motor averaged a minimum of \$5.00 per month in Florida. Depreciation and maintenance costs go on regardless of the number of times the equipment is or is not used. Maintenance costs obviously would increase with increased usage.

4. Cost Per Fisherman Day

There are two remaining items not covered elsewhere. They are automobile costs to and from fishing, and minor equipment expenditures.

In Florida, 50 miles was taken as the average number of round trip miles to and from fishing at a rate of \$0.75 per mile or \$3.75 per trip. However, it has been assumed that a fishing trip is made up of a party of two, thus trip cost would be \$1.88 per trip fisherman. This 50 mile figure is based on the number of miles a major fresh water fishing site (1 fish camp or more) was from population centers of 10,000 persons or more.

Minor equipment is considered to be rods, reels, line, artificial bait, etc., and an average expenditure of \$1.00 per trip was used.

5. Number of Annual Fisherman Trips

Through the application of statistical data available from various sources, it is relatively easy to compute Sections 1 through 4. However, the whole system falls flat on its face if the number of times fishermen go fishing is not ascertainable.

In Florida with its year round fishing season and climate, including 104 weekend days, holidays, and afternoon holidays the fishing trips per year in fresh water on a statewide basis are 26 days per fisherman.

The work is completed, all that remains is to put the frosting on the cake. From Section 1, we have the total number of fishermen, licensed and unlicensed; from Section 2, the percentage of licensed fishermen owning various combinations of major equipment; from Section 3, the depreciation and maintenance costs incurred by fishermen owning major equipment; from Section 4, the travel and minor equipment costs; and from Section 5, the number of fishing trips per year.

In a hypothetical example, assume 99,000 licensed fishermen own boats, motors, and trailers (Section 2), on which depreciation and maintenance costs were \$180.00 per year per fisherman (Section 3). Assuming 50 fishing trips per year per fisherman (Section 5) the automobile and minor equipment expenses (Section 4) would be \$144.00 per year (50 trips x \$1.88/\$50.00 minor equipment). To this figure we add the \$180.00 for depreciation and maintenance of equipment to give a total annual value of \$324.00 for each fisherman owning his own boat, motor, trailer and going fishing 50 times per year. For the 99,000 fishermen, this gives a total of \$32,076,000 per year.

This same method of calculation is used for those fishermen who own motors and rent boats, with the exception of boat and trailer figures, of course.

For those fishermen that rent boats and motors, only the cost of renting this equipment was used plus travel and minor equipment expenditures.

Non-licensed fishermen were assigned only travel and minor equipment expenditures.

Once the bibliography and existing data are compiled, one man can calculate a state's sport fishing resource in approximately 30 days. This short cut method can easily be adapted to evaluate the sport fishing resource in one county if necessary.

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P.O. Box 1838 Vero Beach, Florida April 10, 1956

Mr. Edward Spanke

Director, Public Relations

Outboard Boating Club of America

307 North Michigan Avenue

Chicago 1, Illinois

Dear Mr. Spanke:

Recently the Legislature of Florida authorized a fact finding commission of which I am a member, to evaluate the recreational utilization of surface water in Florida.

Your organization has been suggested to me as a source of statistical information on recreational boating.

I would greatly appreciate statistics on the following items for Florida and the nation as a whole:

- 1. Number of boats and motors sold in 1955,

 The average size of these boats and horsepower of the motors,
Trends of the public to purchase more boating equipment,
Trends of the public to purchase larger boats and motors of higher horsepower.

I would also appreciate any statistical data you may have compiled that I have not specifically asked for.

I realize the magnitude of this request, for which I can offer no return other than the knowledge that your organization has contributed vital information that will help show the staggering recreational values of Florida waters. Thus the need for equitable water laws that will help perpetuate this source of recreation.

Thank you.

Very truly yours,

JC/ab

JIM COUNSELMAN.

SUMMARY REPORT—PANEL DISCUSSION ON PROBLEMS OF WATER MANAGEMENT

BV TRAVIS S. ROBERT

U. S. Fish and Wildlife Service

A panel discussion on Problems of Water Management, conducted (at the Southeastern Association of Game and Fish Commissioners meeting in Little Rock, Arkansas on October 9) followed the presentation of four papers on the same theme. These papers included the following:

- 1. Water Use and the Future of Fish and Wildlife Conservation-Roy Wood, U. S. Fish and Wildlife Service; Roy Grizell, U. S. Soil Conservation Service; Charles Rawls, Tennessee Game and Fish Commission.
- 2. Needed: A State Watershed Program-Harold E. Wallace, Florida Game and Fresh Water Fish Commission.
- 3. Opportunities for Fish and Wildlife Development and Management Programs-Watershed Projects Under Public Law 566-Theodore B. Ford, Louisiana Wild Life and Fisheries Commission.

4. Surface Water Uses-Jim Councilman, Florida Game and Fish Commission,

Three major topics were included in the discussion by the panel members. These included, Wetlands Preservation and Development; Stream Preservation and Surface Water Use.

Each state and agency representative on the panel was asked to briefly discuss the problems of his organization pertaining to the three discussion topics. Wetlands Preservation and Development appeared to have been given greatest consideration by the states represented. This may be attributed in part to the fact that most of the states on the panel are located in the lower Mississippi Valley and have been planning fish and wildlife development needs as part of the congressionally authorized Mississippi River and Tributaries Review.

Stream Preservation has also received consideration by most states represented. This action has included such work as pollution abatement, control of sediment, stream stabilization and dedication of certain stream segments in their natural state.

The serious drought that has gripped the Southland for the past several years has made everyone cognizant of conservation and wise use of water. Many states have already passed some type of water rights legislation and others are studying the problem at the present time. State game and fish commissions represented on the panel had all been active in such studies and the formulation of recommendations pertaining to water rights.