MONTANA DEPARTMENT OF FISH AND GAME
FEDERAL AID IN FISH RESTORATION SECTION
HELENA, MONTANA

JOB COMPLETION REPORT
INVESTIGATIONS PROJECTS

State of Montana

Name Western Montana Fishery Study

Project No. F-12-R-5

Title Georgetown Lake Study

Job No. III

Period Covered May 1, 1958 - April 30, 1959

Abstract:

A creel census was conducted on Georgetown Lake during the summer angling season of 1958 and the winter angling season of 1958-59. The primary objective of this census was to obtain catch and effort information for better management of this popular fishing lake.

Total estimated pressure and catch for the summer and winter seasons and the methods used in computing those estimates are presented.

Recommendations are made to continue the census with some changes in techniques, to obtain closer supervision of the census technicians, and to mark portions of future trout plants in the lake.

Objectives:

Georgetown Lake is one of the most popular and perhaps the most productive mountain lake in western Montana. Its area is 2,800 acres and the lake is located about mid-way between the towns of Anaconda and Philipsburg, Montana.

Past management practices used on Georgetown Lake have consisted of: (1) planting various species and sizes of game fish; (2) opening the summer season one month later and closing it one month earlier than the general trout season; and (3) opening a winter season from mid-December until March 1, on Saturdays, Sundays and legal holidays. At various times since 1912, Georgetown Lake has been managed for rainbow trout, cutthroat trout, grayling, and a cutthroat-grayling combination. Eastern brook trout and silver salmon have also been stocked. Since 1955, the lake has been managed primarily for cutthroat trout. The above management practices have been based upon information taken from spawn trap records, statewide warden creel census and angler reports and also upon the needs of the statewide spawn taking operations.

Information from these sources indicates that: (1) there is a decrease in the individual size of the cutthroat trout in the spawning run during the past five years; (2) angler success has decreased during the same period; (3) angler success is higher during the winter season than during the summer season; and (4) anglers are generally dissatisfied with the present cutthroat management of the lake.

In that no tally of numbers of fish in each spawning run has been kept, and the statewide creel census has given very light coverage to this lake, the cause of these apparent decreases in fish size and fishing success cannot be determined. It was, therefore, apparent that much more detailed information than is now available would be necessa to manage this popular fishing lake successfully in the future.

Prior to the opening of the summer trout season on Georgetown Lake (June 29, 1958) an intensive creel census was designed. The objectives of this census were to collect the following information during both the summer and winter angling seasons.

1. Annual estimated total catch of fish from the lake, by species, in both numbers and pounds.
2. Total annual fishing pressure on the lake.
3. Comparative data between the summer and winter angling seasons in regard to catch, species composition, and fishing pressure.

Techniques Used:

The Georgetown Lake summer creel census began on June 29, 1958 and ended on October 31, 1958. Throughout this 125-day period a creel census technician counted boats and checked angler catches 30 weekend and holiday days, and 38 week days. Table 1 shows the days censused during each period of the summer season.

Census days were divided into a.m. and p.m. days. From June 29 until July 26, the a.m. check hours were from 6:00 a.m. until 4:00 p.m.; and the p.m. check hours were from 12:00 noon until 10:00 p.m. Boat counts were made every two hours, during this period, commencing at the starting hour for both a.m. and p.m. census days.

From July 27 until September 21, the a.m. check hours were from 8:00 a.m. until 5:00 p.m., and the p.m. check hours were from 11:00 a.m. until 10:00 p.m. During this period, boat counts were made every three hours, commencing at the starting hour for both a.m. and p.m. check days.

Due to fewer daylight hours, the a.m. and p.m. division of census days was discontinued from September 22 to October 31. An all day check, from 8:00 a.m. until 5:00 p.m., was in effect during this period. Boat counts were made every three hours and angler contacts were made from 12:00 noon until dark.

The census technician used a 12 foot boat, powered by a 15 h.p. outboard motor, to make the periodic boat counts. The number of boats counted, along with the count hour, was recorded on a boat count form.

Between boat count periods, the census technician would endeavor to contact as many boat parties as possible who had completed their fishing trip. Upon contacting a party, the following information was recorded:

1. Number of anglers in boat party.
2. Length of time party had been fishing.
3. Number of man-hours party had fished (ascertained from number of fishermen in party times hours party had fished).
4. Number of fish by species which the party had caught.

When time permitted, the census technician would obtain total weight by species of all fish in the catch. All the above information was recorded on a creel census form, a sample of which is shown on Figure 7.

From December 14, 1958 through March 1, 1959 the winter angling season was open on Georgetown Lake during Saturdays, Sundays and legal holidays. Table 2 lists the days the lake was checked during the winter season.

On the opening day of the winter angling season (December 14), an attempt was made to count all fishermen and "ice" houses on the lake, every three hours. Fishermen contacted were recorded as "house" or "open ice" anglers and from this record an average number of anglers per house was obtained. This method was feasable only on opening day, when all houses were occupied. On all following days, a periodic car count every three hours was used for estimating total pressure by the same method used with boat counts in the summer census.

In order to insure better coverage during the peak of the winter season, the lake was divided into three areas of responsibility. These are shown on Figure 1.

One census technician was assigned to each of these areas and instructed to make car counts every three hours, and to contact as many angler parties as possible, who had completed their angling trips.

Information recorded was the same as that taken during the summer season.

The winter season was divided into three periods. These were: December 14 to December 31, 1958; January 1 to January 31, 1959; and February 1 to March 1, 1959.

In addition to car counts, and angler contacts, one census technician was assigned the job of taking total weights by species of as many fish as possible. This job was assigned to a different area of responsibility each census day, so as to insure catch weight data from all areas of the lake.

During the summer of 1958, 133,121 cutthroat trout and 150,898 rainbow trout (three inches in length or longer) were planted in Georgetown Lake. One-third of the fish of each species were marked by removing the right premaxillary bone. Census technicians were informed of these marked fish and were instructed to record them separately on the creel census form. Total pressure and catch estimates were computed similar to the method described by Moyle and Franklin (1955).

Census data taken on Saturdays, Sundays and legal holidays were computed separately from weekend check data because of the increased angling pressure on the former.

During the first, second, and most of the third period of the summer census, an overlap period from 11:00 a.m. until 5:00 p.m. was present each day censused. Boats counted during this overlap period were used to estimate boats present during the p.m. period of the a.m. census days and the a.m. period of the p.m. census days.

An example of how this computation was carried out is as follows: From July 27 until August 23, there were four a.m. weekend days censused, and four p.m. weekend days censused. Boats counted during the a.m. sections of this period were listed under three columns as (1) boats counted in overlap period; (2) boats counted in non-overlap period; and (3) total boats counted for the entire period (the sum of 1 and 2). Boats counted during the p.m. days of this period were arranged in the same order.

After arranging the boat counts in this order for both a.m. and p.m. census days, the following step by step method of computation was used. Week days and weekend days were ated separately.

1. Both a.m. and p.m. columns of boats counted in overlap and total boats contacted were totaled. The sum of the total boats counted column was divided by the sum of the total boats in the overlap column for both a.m. and p.m. check days. The quotient thus determined from the p.m. days was used to estimate the total boat count for the a.m. days. The quotient for the a.m. days was used to estimate the total boat count for the p.m. days.

2. The above quotient was used as a constant in determining estimated boats for each individual a.m. and p.m. day. This constant was multiplied by the boats counted in the overlap period for the individual day under consideration. Then this product was added to the number of boats in the non-overlap period for the day. The sum of these two numbers gave the estimated total boat count for the day.

3. Next, the total boat hours were tallied from the census sheet. These boat hours were obtained from actual contacts made by the census technician, and consisted only of completed boat trips.

4. After the total boat hours were obtained, the average length of trip was determined. This was the quotient obtained by dividing the total boat hours by the total boats contacted during the particular day under consideration.

5. After determining the average length of trip, the boat "turnover" quotient was computed. That is, the theoretical number of times during the census day that one group of boats leaves the lake, and another group of boats takes their place. This quotient was determined by dividing the number of angling hours per day (17 hours in Montana) by the average length of trip.

6. Next, the average number of boats per count was computed. This was obtained by dividing the estimated total boat count (from Step 2) by the total number of boat counts that would have been made on a complete census day.

7. The average number of boats per count quotient was then multiplied by the boat "turnover" quotient. This product was the total estimated number of boat trips for the census day.

Following is an algebraic description of the methods used for the expansion of a.m. and p.m. boat count and contact data to full day boat trip estimates, for each individual census days of one period:

Where:

A = Individual a.m. day boat count.
B = Number of boats in A counted during overlap period.
C = A - B.
P = Individual p.m. day boat count.
Q = Number of boats in P counted during overlap period.
R = P - Q.

Then:

$$\frac{\Sigma A}{\Sigma B} \cdot Q + R = \text{Estimated total boat count for individual p.m. day } (E_{BC})$$

and

$$\frac{\Sigma P}{\Sigma Q} \cdot B + C = \text{Estimated total boat count for individual a.m. day } (E_{BC})$$

And where:

H = Number of hours in fishing day.
N = Number of boat counts which would have been made in a full day (not a.m. or p.m.).
L = Average length of trip (from contact data).

Then:

$$\frac{E_{BC}}{N} \cdot \frac{H}{L} = \text{Estimated total boat trips for one individual day } (E_{BT})$$

8. After determining the estimated total boat trips for the day, it was necessary to have a constant to proportionately increase the catch by species, fishermen, and fishermen hours. This constant was obtained by dividing the total estimated boats for the census day by the total boats contacted during the census day. This constant was then multiplied by the total fish checked (by species), fishermen contacted, and fishermen hours for the census day.

9. After the above estimate was made, the number of fishermen contacted was divided by the number of estimated fishermen. This quotient, multiplied by 100, gave the percent contact for the census day.

10. After estimates for each a.m. and p.m. day checked during the period were computed, it was then necessary to estimate the total boats, catch by species, fishermen and fishermen hours for the period concerned. This was accomplished by totaling the individual estimates for all days censused during the period, both a.m. and p.m. Next, the number of days in the period was divided by the number of days (both a.m. and p.m.) that were censused during the period. This quotient was then multiplied by the total number of estimated boats, catch by species, fishermen, and fishermen hours for the days censused. The products thus obtained were considered the total estimated boats, catch, fishermen and fishermen hours for the period concerned. The percent contact for the period was obtained by dividing the total boats contacted by the estimated total boats, and multiplying this quotient by 100.

On opening day (June 29), with from 3 to 9 census takers contacting anglers, contacts exceeded 40 percent of the total estimated fishermen. On the following days, with one census technician working, contacts ranged from 5 to 15 percent. The opening day's contact data, because this day's fishing pressure was markedly higher than any other censused day of the season, was not used for estimating the first period totals. This day was treated separately and its data were added to those of the first period, only after all total estimates for the rest of the period had been completed.

No overlap computation was necessary for the period September 22 to October 31. The total boats counted on any one census day during this period were used in the same manner as the estimated total boat counts were used during the previous period. Thus, Steps 1 and 2 were eliminated. All other estimate computations were carried out as in Steps 3 through 11.

Estimates for the Georgetown Lake winter creel census data were computed similar to the method employed on the summer data, except for the following considerations:

1. The winter season consisted only of Saturdays, Sundays and legal holidays from December 14, 1958 until March 1, 1959, inclusive.

2. Except for the opening day of the winter season (December 14), car counts were used in lieu of boat counts. These car counts were made every three hours on census days, between the hours of 8:00 a.m. and 10:00 p.m. On December 14, fishermen counts were used in place of car counts.

3. There were no a.m. or p.m. census days and thus no overlap periods during the winter season. Thus, total estimates were computed the same as the September 22 to October 31 data, during the summer season.

As previously mentioned, creel census technicians were instructed to obtain as many weights of fish by species as possible, during each period of the summer census. This average weight by period method was employed, so that allowance could be made for weight increase of the fish during the summer growing season. However, with cutthroat trout being by far the most numerous species in the catch, it was not always possible to obtain enough weights of the other fish species during any one period to constitute what was considered a valid sample. Therefore, after consideration of the available summer weight data, the following procedure was adopted for determining estimated average weights per fish by species:

1. A minimum of 20 fish per species, per census period, was required for an average estimated weight of the fish species taken during the period.

2. If weight data for the minimum amount of 20 fish per species were not available for any one period, those weights available for the previous and following period were added to the weights of the period concerned. The average weight thus computed was considered the average weight for the period concerned. If there was no period preceeding the period concerned, weights of fish by species from the following period only were used to determine average weight of the individual fish by species.

3. Where less than 20 fish had been weighed for any one species during the entire summer season, the weights of all fish weighed for the species concerned were used to obtain the average weight of the particular species.

During the winter angling season, when more than one census technician was checking anglers, weight samples were much easier to obtain. Also, during the winter season, fish growth as determined by previous age and growth analysis, is all but curtailed. Thus, average weights by species for the winter season were derived by species from all fish weighed during the entire season.

A 20 pound capacity scale, weighing in units of ounces and pounds, was used for taking fish weights. For purposes of average weight computations of the catch by species, ounces were converted to tenths of pounds.

The average weights of all fish by species thus obtained were multiplied by the estimated number of fish by species taken during the period concerned. By so doing, the total estimated weight of all fish species for both the summer and winter season was obtained.

Shore anglers were counted and contacted by the same method described for boats and boat anglers. However, end of trip contacts with shore fishing parties were far more difficult to make than with boat parties. Because of this, the percent contact of shore fishermen was so low (1.4) for the entire season that catch and pressure estimates made from this data would be very unreliable. Estimates of numbers of shore fishermen were made by the methods described for estimated total boat trips (except that their amount of trips was computed by period rather than by individual days) merely to give some indication of the amount of fishing pressure that was "missed" by the census. No attempt was made to estimate the shore fishermen catch. Shore fishermen numbers are not included with total season estimates under "Findings". They are described and discussed separately under both "Findings" and "Recommendations".

Findings:

An analysis of the summer and winter creel census data from Georgetown Lake shows that the catch consists of the following seven game fish species:

Rainbow trout	Salmo gairdneri
Cutthroat trout	Salmo clarki
Eastern brook trout	Salvelinus fontinalis
Dolly Varden trout	Salvelinus alpinus malma
Grayling	Thymallus signifer
Silver salmon	Oncorhynchus kisutch
Kokanee salmon	Oncorhynchus nerka kennerlyi

Only one Dolly Varden trout was checked during both seasons. This one fish was not listed in the catch estimate. Anglers have reported catching an occasional brown trout (Salmo trutta), in the lake, but none were checked during the creel census study.

Past planting records are ambiguous as to the sub-specific types of fish planted in the lake. This is particularly so in the case of cutthroat trout. According to Weisel (1957) there are two distinct cutthroat trout sub-species recognized in Montana. The coastal cutthroat, Salmo clarki clarki, native to the west side of the Continental Divide, and the Yellowstone cutthroat, Salmo clarki lewisi, indigenous to headwaters of both sides of the Continental Divide.

It appears from visual observations, and from oral, historical, planting information, that both of the above sub-specific, cutthroat-trout forms have been planted in Georgetown Lake at one time or another. Also, written, historical records state that in 1929 cutthroat trout from Lake Tahoe, Nevada were planted in Georgetown Lake.

The present cutthroat trout in Georgetown Lake is known to both fish culturists and fishermen alike as the "Georgetown cutthroat", or the "Georgetown native". The writers make no attempt to taxonomically classify this fish.

During the summer fishing season (June 29-October 31, 1958), an estimated 24,654 fishermen fished for an estimated 94,824 hours, and caught an estimated 47,401 game fish. Total estimated weight of these fish was 40,249 pounds or 20.1 tons. A total of 1,169 boats were contacted by census technicians during the summer season.

Table 3 lists the estimated pressure, catch by species, and pounds by species by periods for the summer angling season.

An analysis of the estimated summer catch data shows that 88 percent of the catch was cutthroat trout, 5.7 percent eastern brook trout, and 3.4 percent grayling. The remaining 2.9 percent consisted of rainbow trout, silver salmon, and kokanee salmon.

A comparison of numbers of fish to pounds of fish for the summer season is presented in Figure 2. These data show that the only noticeable weight per catch increase took place between the third and fourth periods of the summer season.

The estimate data also show that numbers of fishermen declined throughout the summer season. By comparison, the catch per day dropped abruptly between the first and second periods, rose between the second and third periods, and dropped again between the third and fourth periods. The above data is graphically illustrated in Figure 3.

A comparison between the catch on opening day (June 29) and the catch during the remainder of the summer season shows the following: (1) On opening day, 8.5 percent of the total number of anglers, who fished on the lake during the entire summer season, applied 13.3 percent of the total season's pressure, and harvested 20.0 percent of the total season's catch; and (2) compared to the mythical "average day" of the summer season, on opening day, 10.7 times as many anglers applied 16.6 times as much angling pressure and harvested 23.8 times as many fish.

Throughout the winter season (Saturdays, Sundays, and legal holidays from December 14, 1958 through March 1, 1959), an estimated 17,974 fishermen fished for an estimated 83,369 fisherman hours, and harvested an estimated 70,252 game fish. Total estimated weight for these game fish was 42,125 pounds, or 21.1 tons. A total of 1,142 cars were contacted throughout the winter season.

Table 4 lists the total estimated pressure, catch by species, and pounds by species by periods for the winter season.

During the summer of 1958, the following numbers and species of fish were planted in Georgetown Lake: grayling 20,000; rainbow trout 150,898; and cutthroat trout 133,121. The above rainbow and cutthroat were three inches in length or longer, when planted.

One-third each of the above rainbow and cutthroat trout plants were marked by removal of the right premaxillary bone. The marked hatchery fish, while entirely absent from the summer catch, appeared in the winter catch on opening day and were present in this catch throughout the entire season. As shown on Table 4, an estimated 631 marked rainbow, and 1,773 marked cutthroat trout were harvested during the winter season. If it is assumed that unmarked fish from the 1958 plant were harvested in proportion to the marked fish of this plant, then an estimated total of 1,893 rainbow and 5,319 cutthroat trout of the 1958 plant were harvested during the winter season of 1958-1959. This, then, would indicate that 10.3 percent of the total fish harvested during the winter season consisted of rainbow and cutthroat trout planted during the summer of 1958. The figures also indicate a return to the creel of 1.3 percent for rainbow and 4.0 percent for cutthroat, during the first season they appeared in the catch.

An analysis of the estimated winter catch data shows that 89.6 percent of the catch was cutthroat trout (both marked and unmarked) and 5.4 percent eastern brook trout. The remaining 5 percent consisted of rainbow trout (both marked and unmarked), grayling, silver salmon and kokanee salmon.

The winter kokanee salmon catch dropped from an estimated 850 fish to 32 fish between the first and second periods of the winter census. No kokanee salmon were checked during the third period of the winter season. This abrupt drop in the kokanee salmon catch is attributed to the completion of the life cycle of this particular age class of kokanee salmon that had entered the fishery during the fall of 1958. It is interesting to note that kokanee salmon have never appeared on the planting record for Georgetown Lake.

A more direct proportion between average catch and average fishermen per day, per period was evident during the winter season than during the summer season. (See Figure 4).

An estimated 22,851 more fish were harvested during the winter season than during the summer season. Of these 22,851 fish, 21,303 were cutthroat trout. A comparison between estimated total summer and winter catch by species is presented in Figure 5.

Weight average for all fish was 0.8 pounds per fish, during the summer season and 0.6 pounds per fish for the winter season. This decrease in average weight per fish during the winter season was probably due to the presence of rainbow and cutthroat trout from the 1958 plant appearing in the catch. A comparison of total weights of fish by species between the summer and winter seasons is presented in Figure 6.

The average catch per hour was 0.5 fish for the summer season and 0.8 fish for the winter. Also, a greater fluctuation in catch per hour, between periods, was evident during the summer than during the winter. Catch per hour data by periods for both summer and winter seasons are presented in Figures 8 and 9 respectively.

During the summer season, the catch per fisherman averaged 1.9 fish or 1.6 pounds, and during the winter the average catch was 3.9 fish or 2.3 pounds per fisherman.

Combined total estimates for both summer and winter seasons show that 42,628 fishermen fished for 178,193 fisherman hours and caught 117,653 game fish. Estimated total weights for both summer and winter seasons was 82,374 pounds or 41.2 tons. This weight estimate represents a yield of 29.4 pounds of fish per surface acre of the lake.

A total of 2,311 parties, or 4,801 individual anglers were contacted by creel census technicians during the summer and winter seasons.

Total estimated shore fishermen, shore fishermen contacted and percent of contact are shown by periods for the summer season on Table 5. These data are not included in the above listed totals for the lake. Estimates of effort and catch were not made for shore fishermen. The percent contact was too low to permit worthwhile total estimates to be made. The estimate of these numbers was made and included merely to illustrate that all other estimates in this report most likely are lower than the true figures.

An effort was made to collect scale samples from as many fish as possible during the summer season. However, because cutthroat trout made up such a large portion of the catch, it was not possible to obtain enough scale samples from all the other species. Three species, from which enough scale samples were obtained to be considered worthy of inclusion, were cutthroat trout, rainbow trout and grayling. Age and growth summaries for these three species are presented in Table 6. Rainbow trout had the fastest growth rate of these three species in Georgetown Lake.

Recommendations:

1. Confidence limits of boat angler estimates were not computed for this season's data because the writers felt such limits would be of little value in describing the precision of total estimates which ignored shore fishermen. However, to better evaluate the methods used, it is recommended that confidence limits be computed for the boat angler pressure and harvest estimates before this census is operated again.

2. The census study should be continued according to the following recommendations for at least a five-year period, in order to provide a suitably sound basis for the management of this lake.

    a. The same a.m., p.m., weekday, weekend day divisions of census days and criteria for setting up the census schedule as were used last year should be used again.

    b. Boat and shore angler counts should be at three-hour intervals, and arranged similarly to the counts used in periods 2 and 3.

    c. In the third period, shore angler counts (but not boat counts) should be continued until 2000.

    d. A postcard, name record, method should be employed for obtaining a sufficient number of completed-trip, catch-and-effort, contacts from shore anglers.

    e. Confidence limits should be computed for estimates based on data collected in future years.

    f. A larger and safer boat should be provided for the technicians operating the summer census.

    g. One-third of each species in each year's plant should be marked for the duration of the census.

    h. Other portions of the district work load should be adjusted so that the census technicians could receive closer supervision from permanent project personnel. This may well require that the Georgetown census be operated only in alternate years. Although this would result in the loss of data of immediate value to the management of the lake, it would extend the census in time and would likely provide as valuable data for the lake's long-term management as would a census run every year for a shorter length of time. Population sampling should be repeated yearly.

3. Management recommendations for the lake, based on previous planting records, past experience, and last year's census and survey data (see completion report for Job No. I for the survey data) are as follows:

    a. Present seasons should be continued, at least until the census has been operated another year.

b. The yearly plant should be at least 100 trout per acre (280,000 total) and these fish should be three inches or longer, when planted. From the standpoint of both biology and public relations, rainbow trout are recommended. Their growth rate is fastest (Table 6) and their ability and/or inclination to put up a more spectacular battle than the cutthroat when hooked, makes them more desirable to most anglers.

However, since Georgetown Lake is one of the sources of the Montana hatchery system's trout egg supply, its planting must be dictated by the statewide needs of that system. Therefore, the lake's planting recommendations cannot be based on what is most desirable for it alone.

The hatchery system currently needs cutthroat trout from the Georgetown Lake spawn taking stations. So, from a strictly hatchery standpoint, cutthroat trout only should be planted.

Both of the above needs could be satisfied by a plant of half of each of these species, however, again from a biological standpoint, in order to prevent hybridization, rainbow and cutthroat trout should not be planted together. Thus, a sound biological recommendation for this lake must be to plant either rainbow or cutthroat trout, but not to plant both at the same time.

Since the Georgetown cutthroat is a hybrid of various cutthroat and rainbow strains, it is recommended that its use be curtailed as fast as stocks of pure strain Yellowstone and west slope cutthroat can be built up. When such a time arrives, it is recommended the plant be changed to rainbow trout only, and the spawn taking stations operated as sources of rainbow eggs. Because of a limited spawning area which is filled with resident rook trout, and a large red-sided shiner population in the lake itself, it is expected that Georgetown Lake will continue to require annual stocking with three-inch and longer trout, in order to maintain a suitable sport fishery.

Literature or references cited:

Moyle, John B. and Donald R. Franklin, 1955. Quantitative Creel Census on Twelve Minnesota Lakes. Trans. Am. Fish. Soc., Vol. 2:85, pp. 28-38.

Weisel, George F., 1957. Fish Guide for Intermountain Montana. Mont. State Univ. Press, 88 pp.

Prepared by Robert C. Averett and Arthur N. Whitney

Approved by _____

Date 7 July 1959

Table 1. Georgetown Lake summer creel census schedule.

Month	Period	Day of Week						
		Sa	Su	M	Tu	W	Th	F
June			29A	30A	1A	2	3P	4P
July	1	5A	6P	7	8	9	10A	11P
		12P	13A	14P	15A	16	17A	18
		19	20P	21	22	23P	24	25
		26P	27A	28A	29	30	31	
								1P
		2A	3P	4	5	6	7A	8P
August	2	9P	10A	11A	12P	13	14	15
		16A	17P	18P	19	20	21P	22
		23P	24A	25A	26	27P	28	29
		30A	31P					
				1A	2	3	4	5P
		6P	7A	8A	9P	10	11	12A
September	3	13A	14P	15	16P	17A	18P	19A
		20P	21A	22*	23	24*	25	26
		27	28*	29	30*			
						1	2	3
		4*	5	6*	7	8	9*	10
October	4	11	12*	13	14*	15	16	17*
		18*	19	20	21	22*	23*	24
		25	26	27*	28	29	30*	31

Legend: A.M. Days - A
P.M. Days - P
All Day Checks*

Period 1 - A.M. 6:00 a.m. - 4:00 p.m.
P.M. 12:00 noon -10:00 p.m.
Period 2 & 3 - A.M. 8:00 a.m. - 5:00 p.m.
P.M. 11:00 a.m. -10:00 p.m.
Period 4 - Boat counts - 8:00 a.m.-5:00 p.m.
Angler checks - 12:00 noon-dark

Table 2. Georgetown Lake winter creel census schedule.

Period	Month	Saturday	Sunday	Holiday
1	December		14*	
		20*	21	25
		27	28*	
2	January			1
		3*	4	
		10	11*	
		17*	18	
		24	25*	
		31*		
3	February-March		1	
		7	8*	12*
		14*	15*	
		21*	22*	23*
		28*		
			1*	

* Denotes days censused.

Table 3.* Estimated boats, fishermen, pressure and catch for Georgetown Lake summer creel census, 1958.

Period	Boats	Fishermen	Fishermen Hours	Rainbow No.	Rainbow Wt.	Cutthroat No.	Cutthroat Wt.
29 June 26 July	5,456	12,919	50,579	586	1,289	27,156	21,725
27 July 23 August	2,678	5,722	22,590	126	227	4,764	3,811
24 August 30 September	2,707	5,338	18,752	232	511	9,115	7,292
1 October 31 October	314	675	2,903	37	66	639	575
Totals	11,155	24,654	94,824	981	2,143	41,674	33,403

* Continued on following page.

Table 3 (cont'd). Estimated boats, fishermen, pressure and catch for Georgetown Lake summer creel census, 1958.

Eastern brook		Grayling		Silver salmon		Kokanee salmon		Total	
No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.
768	922	334	234	227	386	66	46	29,137	24,602
582	640	844	591	83	142	0	0	6,399	5,461
1,037	1,037	441	309	51	87	0	0	10,876	9,222
299	299	0	0	14	24	0	0	989	964
2,686	2,898	1,619	1,134	375	639	66	46	47,401	40,249

Table 4.* Estimated cars, fishermen, fisherman hours, catch and weight by species, by periods, for Georgetown Lake winter creel census.

Period	Cars Contacted	Fishermen	Fisherman hours	Rainbow (marked) No.	Rainbow (marked) Wt.	Cutthroat (marked) No.	Cutthroat (marked) Wt.	Rainbow No.	Rainbow Wt.
14 Dec. 31 Dec.	4,824	6,616	31,708	274	110	332	100	714	643
1 Jan. 31 Jan.	4,026	8,536	39,338	296	118	1,024	307	570	513
1 Feb. 1 March	1,381	2,822	12,323	61	24	417	125	238	214
Totals	10,231	17,974	83,369	631	252	1,773	532	1,522	1,370

Table 4 (cont'd). Estimated cars, fishermen, fisherman hours, catch and weight by species, by periods, for Georgetown Lake winter creel census.

Cutthroat		Eastern brook		Grayling		Silver salmon		Kokanee salmon		Total	
No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.
24,612	14,767	1,928	1,157	164	98	24	14	850	680	28,898	17,569
27,590	16,554	1,610	966	132	79	64	38	32	26	31,318	18,601
9,002	5,401	288	173	17	10	13	8	0	0	10,036	5,955
61,204	36,722	3,826	2,296	313	187	101	60	882	706	70,252	42,125

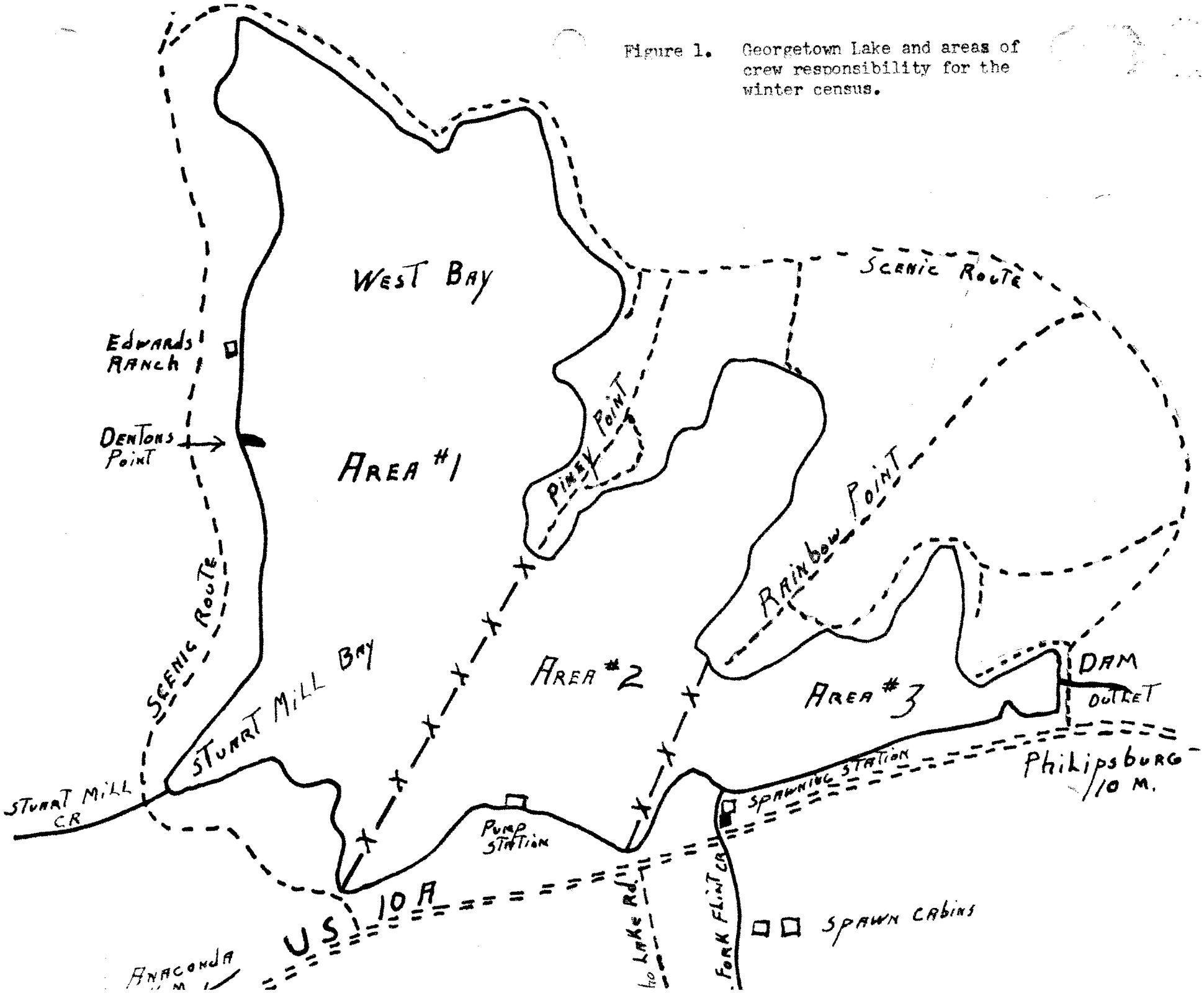
Table 5. Total estimated shore anglers, shore angler contacts and percent contact, by periods, summer season.

Period No.	1	2	3	4	Total for season
Week days	1,032	1,135	1,678	1,245	5,090
Weekend days	2,009	976	927	416	4,328
Total	3,041	2,111	2,605	1,661	9,418
Contacts	72	4	13	44	133
Percent contact	2.3	0.2	0.5	2.6	1.4

Table 6. Length, in inches, at annulus formation of cutthroat and rainbow trout and grayling. From 1958 scale samples, Georgetown Lake summer census. Numbers in parentheses indicate sample size.

	ANNULUS NUMBER				
SPECIES	I	II	III	IV	V
Cutthroat trout	3.9 (124)	9.4 (119)	13.6 (47)	16.7 (15)	23.1 (1)
Rainbow trout	6.1 (24)	13.5 (23)	15.9 (1)		
Grayling	3.4 (32)	9.4 (27)	13.0 (16)		

Figure 1. Georgetown Lake and areas of crew responsibility for the winter census.



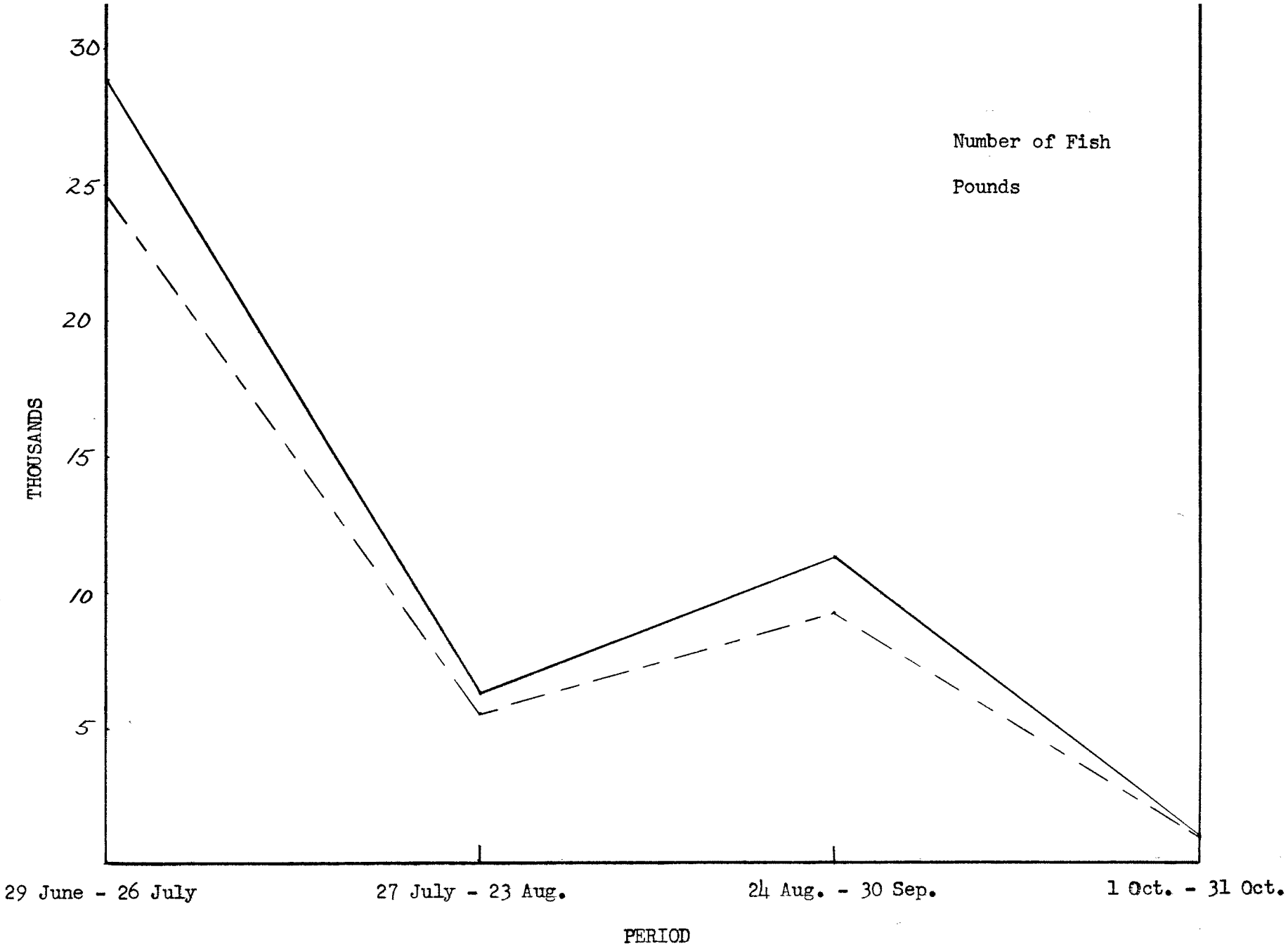


Figure 2. Comparison of numbers to weights of fish per period. Summer Census.

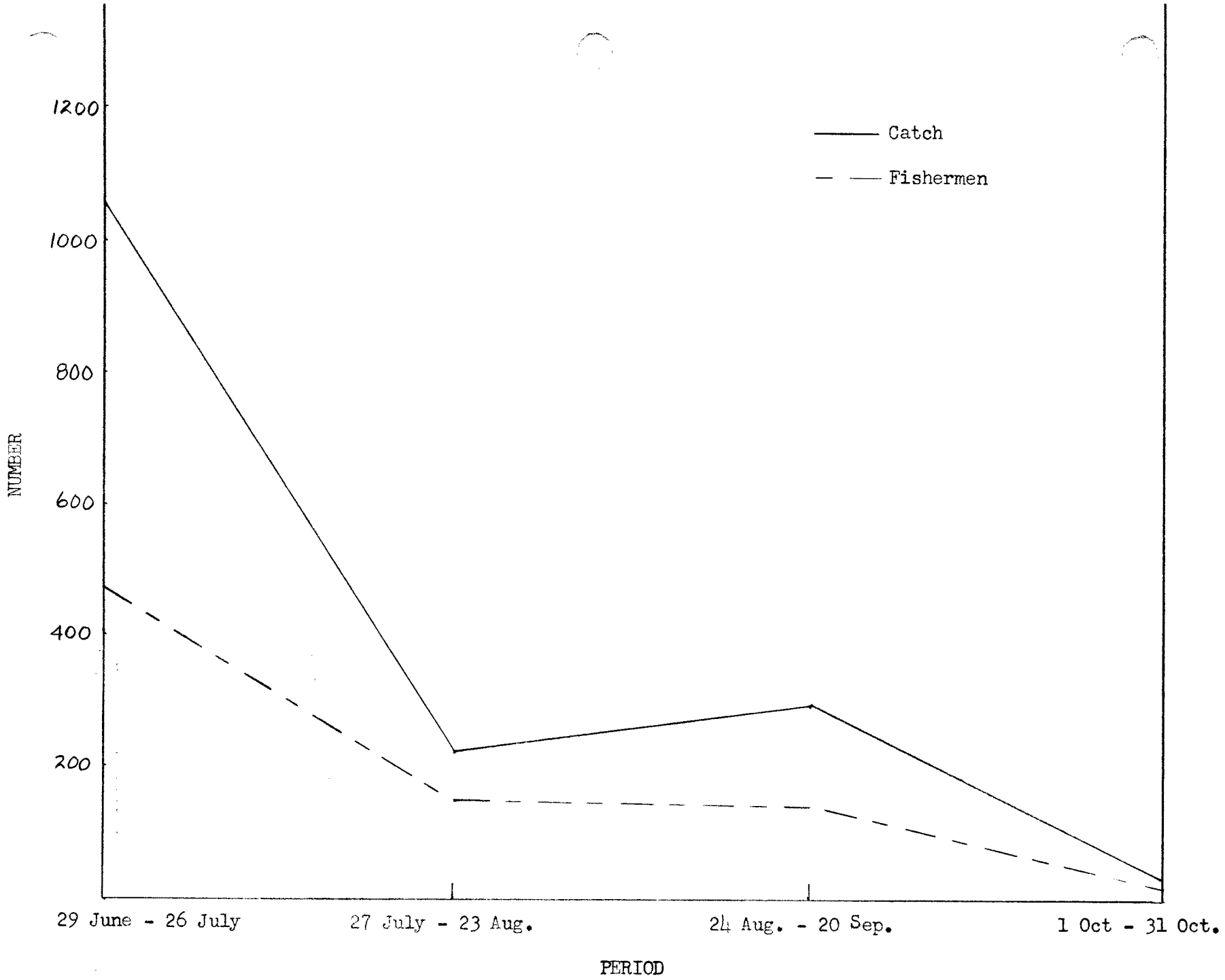


Figure 3. Average catch and Fishermen per day per period. Summer Census.

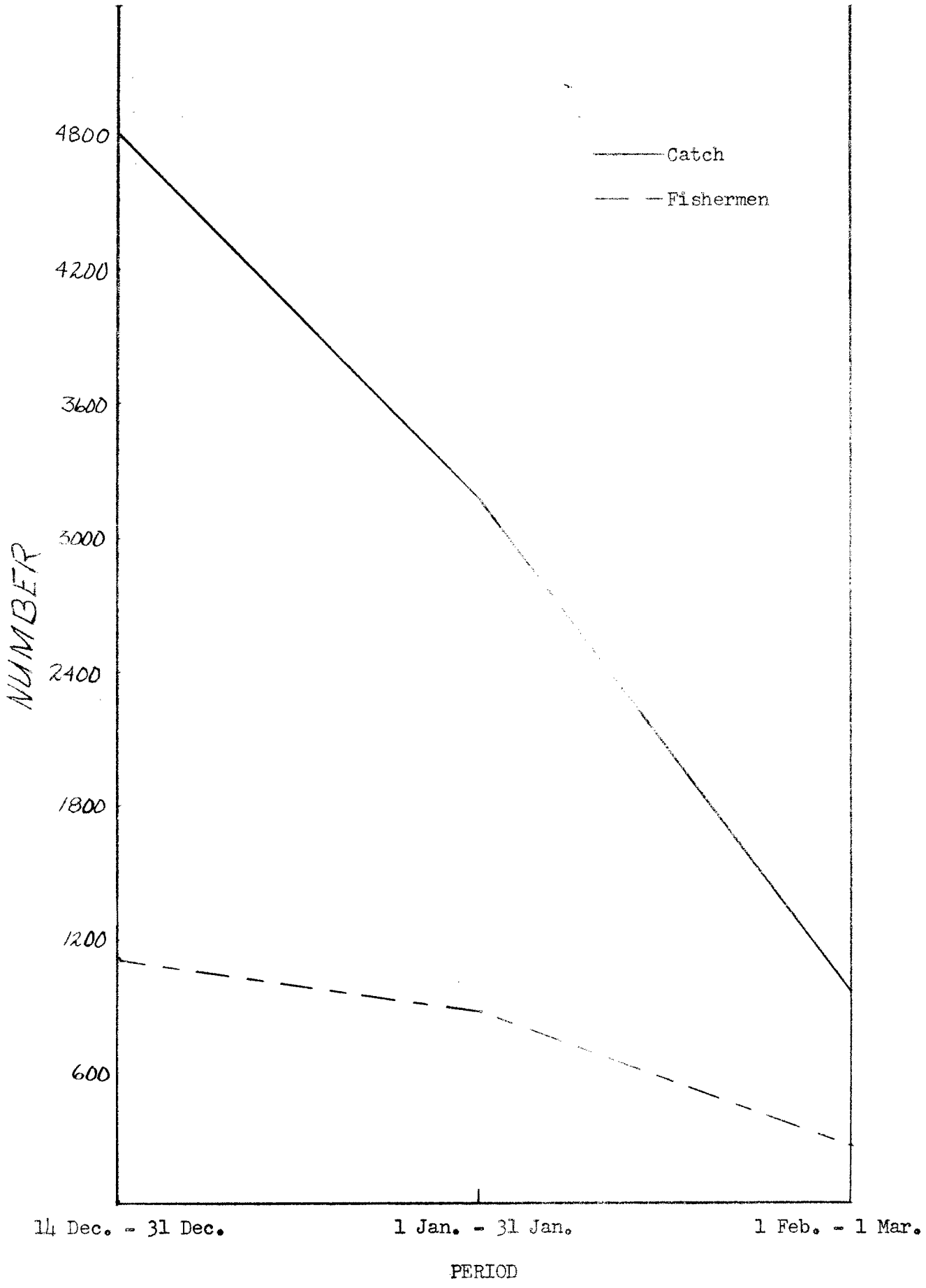


Figure 4. Average catch and fishermen per day per period. Winter Census.

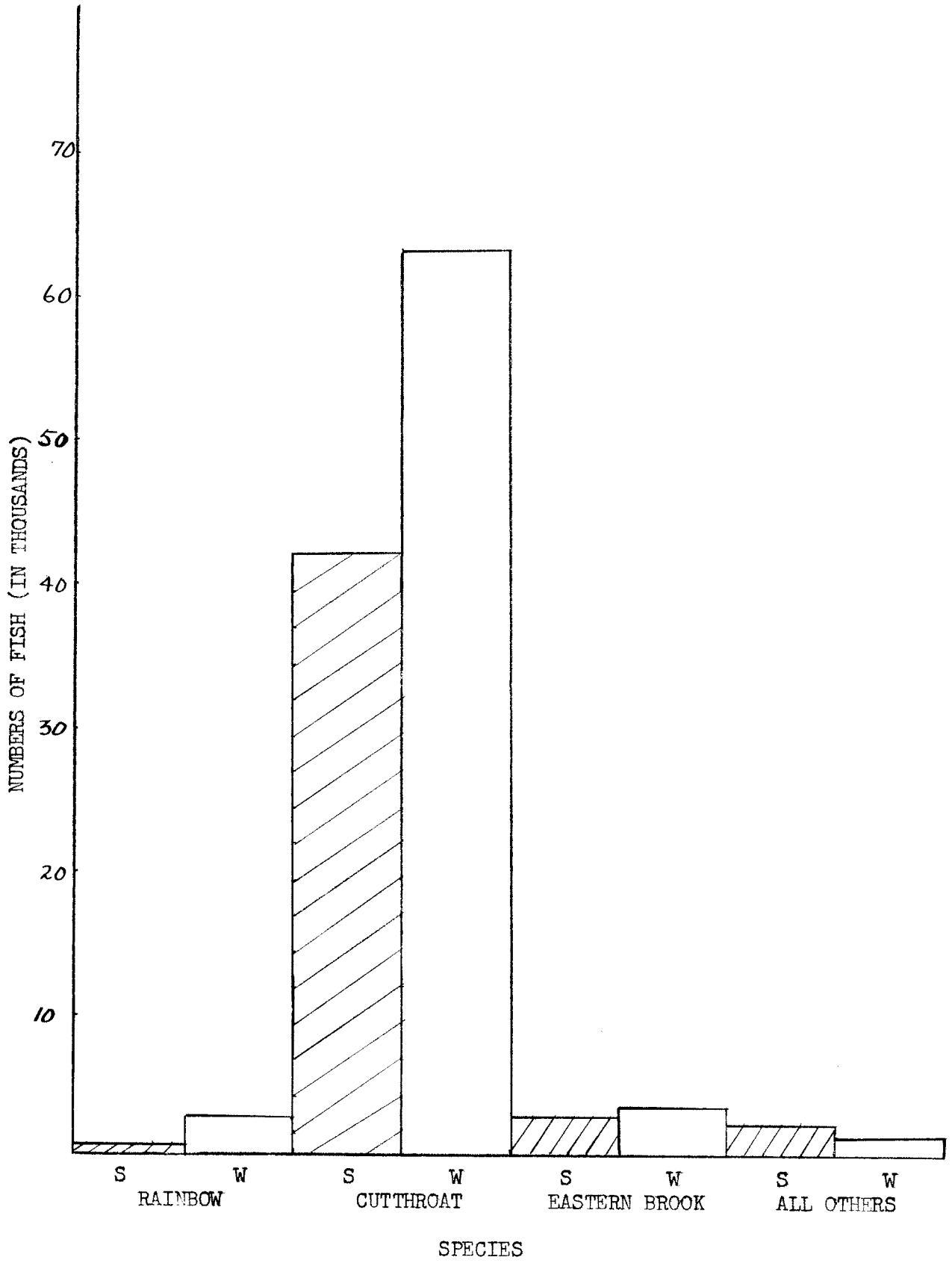


Figure 5. Comparison of numbers of fish in summer (S) and winter (W) catches, by species, from Georgetown Lake.

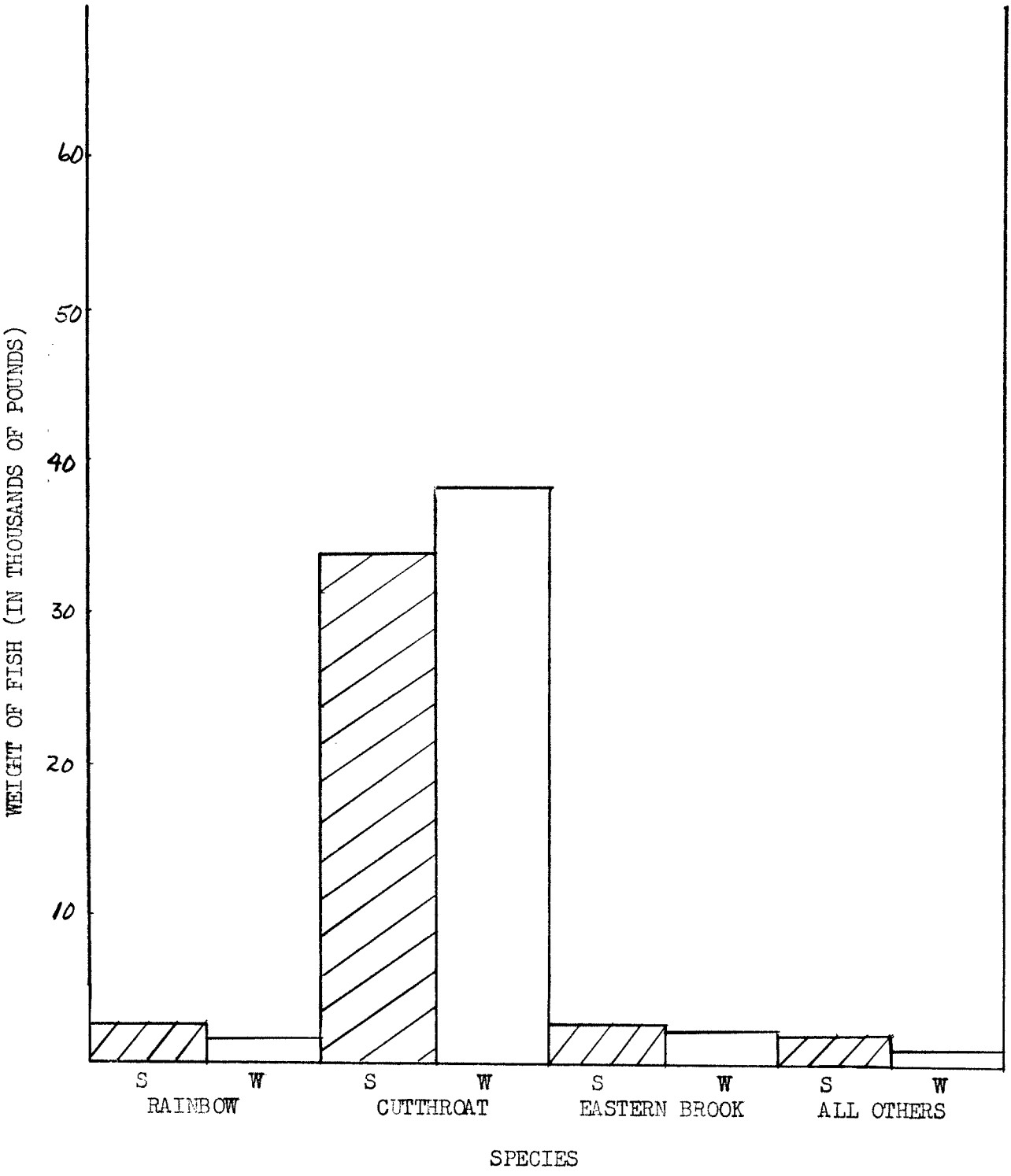


Figure 6. Comparison of weights of fish in summer (S) and winter (W) catches, by species, from Georgetown Lake.

Figure 7 Georgetown Lake census form.

GEORGETOWN LAKE CREEL CENSUS

WEATHER:

Date_____

eet_____ of _____

Censused by_____

TOTALS

Boat
Shore
No. P'me
Time Start
Time End
Total Time
Man Hours
No. Wt. RBR
No. Wt. RBT
No. Wt. BR
No. Wt. LT
No. Wt. BB
No. Wt. CB
No. Wt. SS
No. Wt.
No. Wt.
Hardware
Bait
Flies

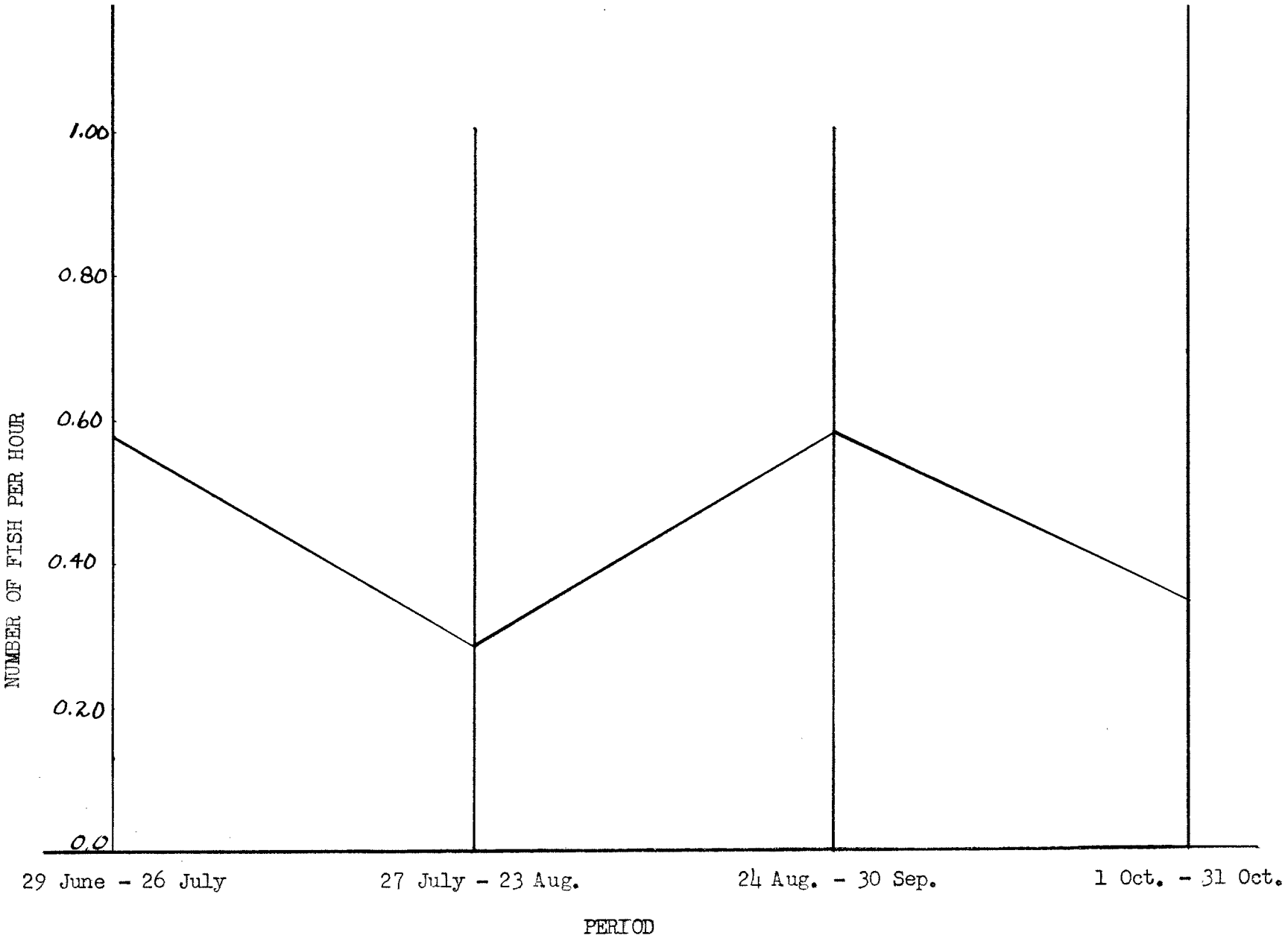


Figure 8. Average catch per hour, by periods. Summer census.

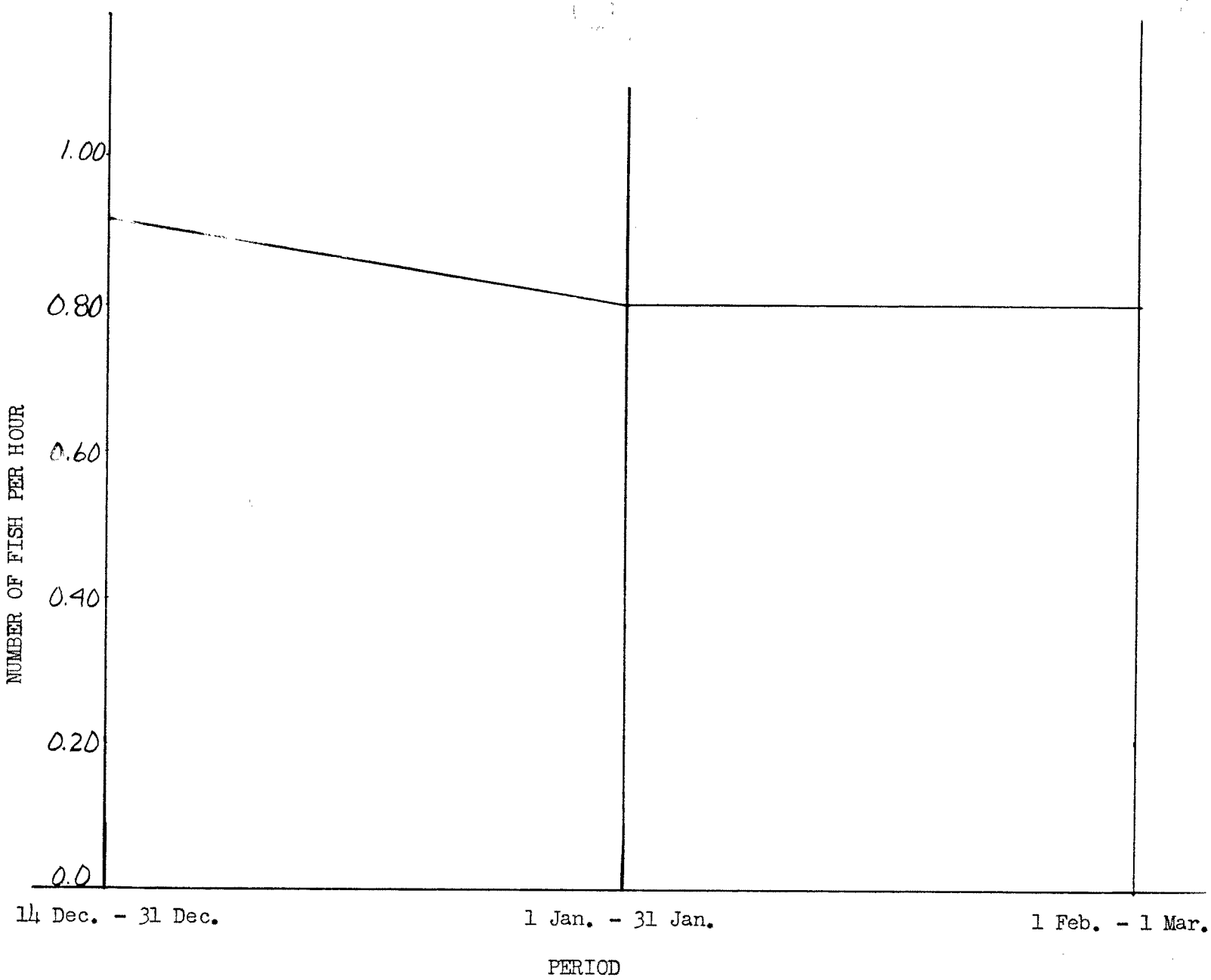


Figure 9. Average catch per hour, by periods. Winter census.