MARINE FISHERIES REPORT

(May-August) 1948

Otter-Trawl

Tagging of otter-trawl fish began on April 27 and has continued through the summer as time and weather permitted. The data on the first trip have already been sent in and the remaining data are enclosed with this report. Notes on such things as catch composition of the drags, numbers of dead fish, etc. were also taken and are enclosed.

A summary of the number of tagged fish by species is given. The great majority of the 1522 fish tagged were English, petrale, and Dover sole with a scattering of other species. None of the rockfish were tagged successfully with the exception of Sebastodes flavidus (yellow-tail rockfish) taken in relatively shallow water.

The number of fish tagged has been inadequate but will perhaps give at least preliminary data. Tagging is being continued but because of the loss of summer help and fall storms not as many tags will be put out.

Recoveries have been too few to give any significant results. Of the fifteen recoveries, nine have been of English sole, four of petrale and one each of ling cod and Dover sole. None of these have shown migrations with three exceptions. A petrale was recovered off Destruction Island and another off Newport. An English sole was recovered off Destruction Island. All three fish had been tagged near the mouth of the Columbia River.

The tagging during the summer has been moderately successful. Most of the larger boats go tuna fishing and it has been difficult at times to find boats to work on. Many of the smaller boats do not have adequate quarters. On several trips weather conditions were such that very little tagging could be accomplished. However, if one person were available for tagging at all times during the summer a considerable number of tags could be put out.

Sampling of the otter-trawl catch has continued. Length-frequencies and otoliths are being taken from the landings of English, petrale, and Dover soles. The length-frequency distribution of the English sole for the period from January 1 through August 31, 1948 is shown in Figure One. The fishery for English sole is seen to depend primarily on the females. There are almost seven times as many females as males shown in the graph. The females are also larger than the males. The explanation for this preponderance of females lies in the fact that the fish are sorted for size while at sea. Since the males are on the average smaller, they are discarded and the larger fish (mostly females) are brought in. The discord line is at about 33 centimeters.

Figure Two shows what happens even more clearly. The samples summarized in this graph were taken from the drag boat Marion F. This boat supplies the mink farmers with scrap fish as well as bringing in food fish to be filleted. The graph at the top of the page is made up of English sole which were marketed as mink food. These are the fish which ordinarily would be separated out from the food fish and thrown back into the sea with almost a 100% mortality. Instead of the usual preponderance of females, there are almost two males for every female. This indicates that on the fishing grounds the sexes may be much more evenly distributed than sampling in the fish houses seems to show. Furthermore, fish of a certain length will be automatically sorted out by the size mesh used in the cod-end. In this particular case the mesh was $4\frac{1}{2}$ inches, center to center, and this size opening probably let more males than females escape because of the smaller size of the former.

The graph at the bottom of the page is made up of fish sorted out to be filleted. This graph is similar to that shown in Figure One. The females are again in the majority (8 to 1) while most of the smaller males have been separated out.

This difference in size of the sexes poses a problem in any regulation of the mesh size. These graphs indicate that a $4\frac{1}{2}$" mesh in the cod end will catch

many males too small to be marketed. Usually these small males are thrown overboard and almost all die. Now supposing that a five inch mesh will allow all the fish smaller than the discard size (33 cm.) to escape. A glance at the top graph of Figure Two shows that such a condition would allow the majority of the males to escape, but these would be an economic waste because most will not become large enough to be caught and marketed.

Figure Three shows the length-frequency of the petrale sole measured between January 1 and August 31, 1948. The females are again seen to be larger and in the majority. However, there are only about twice as many females marketed as males while among the English sole there are seven times as many females marketed. The same reasoning probably holds for the petrale sole as for the English that the majority of the smaller fish discarded are males. The petrale are relatively scarce in the fishing areas near Astoria and it is more difficult to obtain adequate data concerning them.

In the market samples of Dover sole the males approximate the females more closely in size and abundance. This is indicated by Figure Four. However, even among the Dover sole the females are larger and more abundant in the samples taken. It is noted that no samples were taken before May 29, 1948. This is because the Dover sole are not landed at Astoria during the winter in commercial quantities. These fish presumably move into the deeper waters and are not available to the fishermen. In the waters off Eureka the draggers operate in depths over 200 fathoms and in these waters have made excellent catches of Dover sole even during the winter months.

Some of the flat fish have also been weighed in order to construct a length-frequency curve. The length-weight curve for the Dover sole is shown in Figure Five and that for the English sole in Figure Six. Not enough petrale have been weighed to give a good curve. Each point represents the average of the weights for that length. More weights are being taken, particularly in the extreme sizes to smooth out the curve.

Otoliths for age determinations are also being taken from the same three species of flat fish. Preliminary readings have been made of otoliths from the English sole. Figure Seven shows the age composition of the market samples from January 15 to March 30. It is noted that the majority of the females marketed are in the group with five, six, and seven rings. The curve for the females is based on 206 otoliths and probably gives a fair approximation of the actual age composition. The curve for the males is based on too few readings (30) to be very accurate.

Figure Eight shows the length attained at various ages. The females enter the fishery at between four and five years of age. The males never do get to be of a size to enter the landings in any numbers. As mentioned before, only 30 male otoliths have been read and the results are not conclusive. However, sampling shows that actually very few males do enter into the market samples.

ALBACORE

July-August 1948

The albacore season began with a rush. The first length-frequency sample was taken on July 12 and by July 23 we had measured 710 fish. During the same period in 1947 only 128 fish had been measured which represented almost all the fish seen during this time. July continued to be a good tuna month and was even better than in 1944, the big tuna year. The landings at Union Fishermen's Coop. Packing Company amounted to 380,186 lbs. compared with 123,743 lbs. in July 1947. The C. R. P. A. reported landings of 266,513 lbs. this year compared with 156,271 lbs. in 1947 and 250,650 lbs. in July 1944.

During the month of August the tuna landings dropped off to about what they had been in 1947. The C. R. P. A. reported landings of 491,293 lbs. during the month compared with 490,742 lbs. in 1947 and 1,128,254 lbs. in 1944. Since August is the peak month of the fishery, hopes for a record season were dim.

The research carried out followed the pattern set last season. Most of the work consisted of length-frequency market measurements. Scales and weights were also taken from a portion of the samples. Some gonads were taken for sex ratio studies.

The method of measuring differed from that of 1947 and earlier years. The method was changed to conform to the procedure used by California and the Fish and Wildlife Service. Instead of a measuring board, the fish were measured by means of calipers. The fixed arm of the calipers was placed against the forward end of the upper snout and the sliding arm adjusted against the center rays of the caudal fin so that the posterior fringes of the caudal fin were compressed. In previous years the measurements had been taken to the distol end of these hair-like fringes. However, often the fringe is at least partially mutilated and it has been difficult to read to exactly the end. Since the fringe is only a couple of millimeters long

and is often frayed, there is no adjustment needed to convert one method of measuring to the other. This was determined by measuring a series of the fish in both ways and no significant differences could be noted. The fish are measured to the nearest ½ centimeter.

The lengths taken were grouped and plotted in chronological order in Figure Nine. In previous years there have been two size groups in the fishery at various times. During some years the smaller size groups predominated, in a few years the larger fish predominated, and during one year the sizes were present in about equal numbers. The smaller of these size groups averages about 75 centimeters. It is evident that this year the smaller size group dominates with only a scattering of the larger fish. The mode appears to be at a smaller size than in 1947. Also, the fish do not seem to show as marked a growth rate. These points will be gone into more thoroughly when the final report for the 1948 season is submitted.

Figure Ten shows the length-frequency distribution of the entire sample taken through August 31, 1948.

During the last few days of August the marine fisheries laboratory was directed by the Pacific Marine Fisheries Commission to conduct a racial study of the Japanese and Eastern Pacific albacore. This was to be based on frozen albacore being imported from Japan. Only one Astoria firm had imported Japanese albacore and most of these had already been processed. However, it was hoped to make as many measurements as possible on these fish.

The Japanese albacore were all as large as our larger fish. Therefore it was decided to compare the smallest Japanese albacore with the largest local albacore to avoid differences in body proportions due to different growth rates in various parts of the body.

It was seen at once that there might be errors introduced by comparing the frozen Japanese albacore with local fresh albacore. The Japanese albacore were somewhat misshapen from the effects of being transported. The snouts on almost all of

them were bruised and battered. Most of the fins were frayed or broken. The effects of freezing and storing alone may have changed the body proportions. However, it was decided to go ahead with the study in spite of the possible erros involved since these were the only fish available.

The entire month of June was spent on an ill-fated tuna exploratory trip in southern California. The report on this trip has already been submitted.

PILCHARD

July-August 1948

The first pilchard landing of the season was made on July 16. The total taken during the month was 1,438 tons. Last year the July landings in Oregon were 1,609 tons. The catch for August was also under that for the same month last year.

Sampling of the pilchard catch was again undertaken in cooperation with Washington, California, British Columbia, and the Fish and Wildlife Service. Samples were taken as often as possible. The fish were measured, scaled, weighed in groups of 50, and scales taken. The scales were sent to the Fish and Wildlife Service at Stanford University for age determination.

The length-frequency distribution is shown in Figure Eleven. The graphs are in chronological order and arranged in two millimeter size groups. The fish this year are even larger and presumably older than the fish of last season. This bears out the prediction made that the Oregon catch would be small and composed of old, large fish.

The pilchard fishery will be discussed in more detail at the end of the season.

FIGURE ONE

LENGTH-FREQUENCY
ENGLISH SOLE
Jan. 1 - August 31, 1948
Willapa Bay to Cape Lookout
(Area 1238 - 1322)

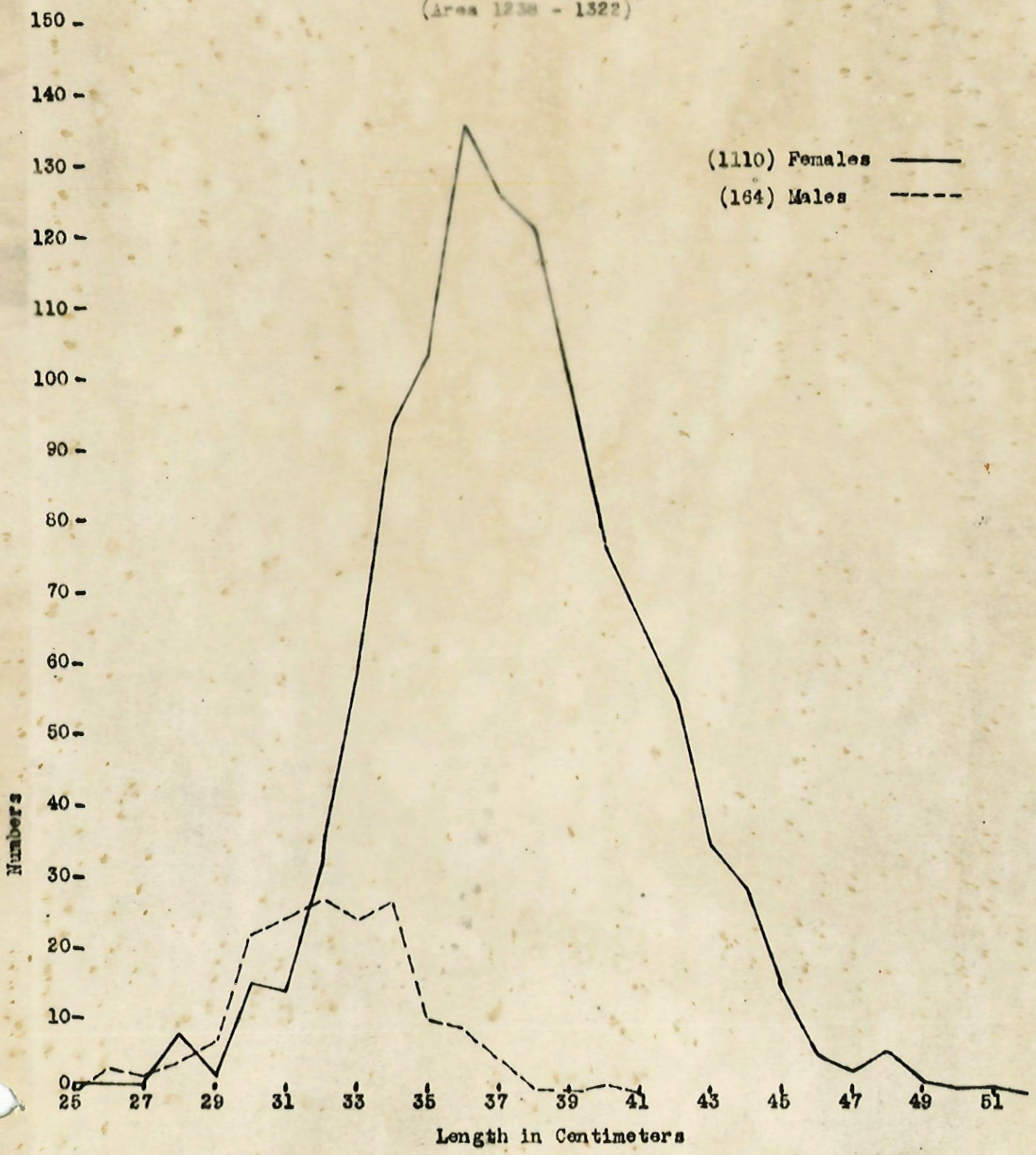


Figure Two

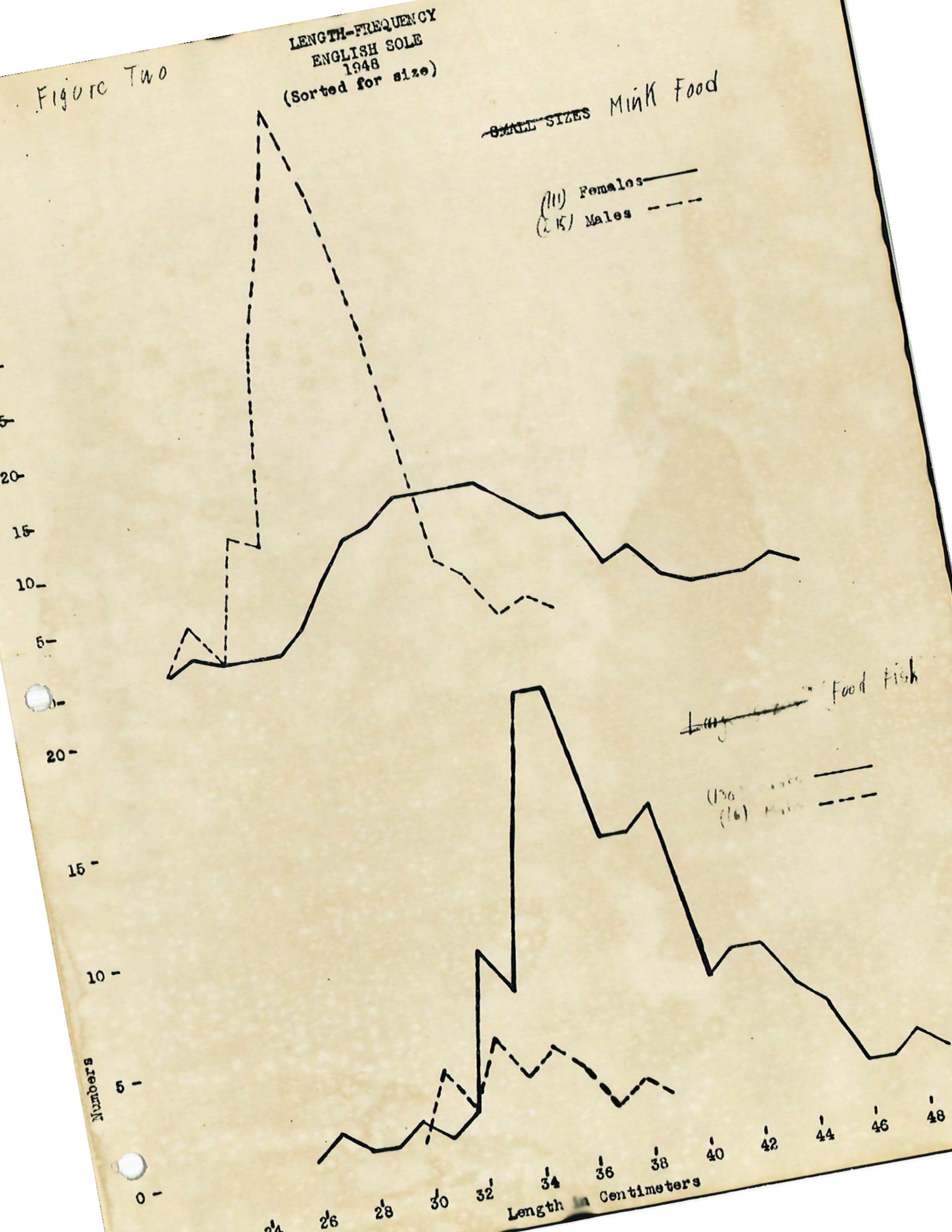

LENGTH-FREQUENCY
ENGLISH SOLE
1948
(Sorted for size)
~~SMALL~~ SIZES Mink Food
(11) Females
(15) Males
Food Fish
(136)
(16)
Numbers
0
5
10
15
20
25
20
15
10
5
24
26
28
30
32
34
36
38
40
42
44
46
48
Length in Centimeters

FIGURE THREE

LENGTH-FREQUENCY
PETRALE SOLE

Jan. 1 thru Aug. 31, 1948
Willapa Bay to Cape Lookout
(Area 1238 - 1322)

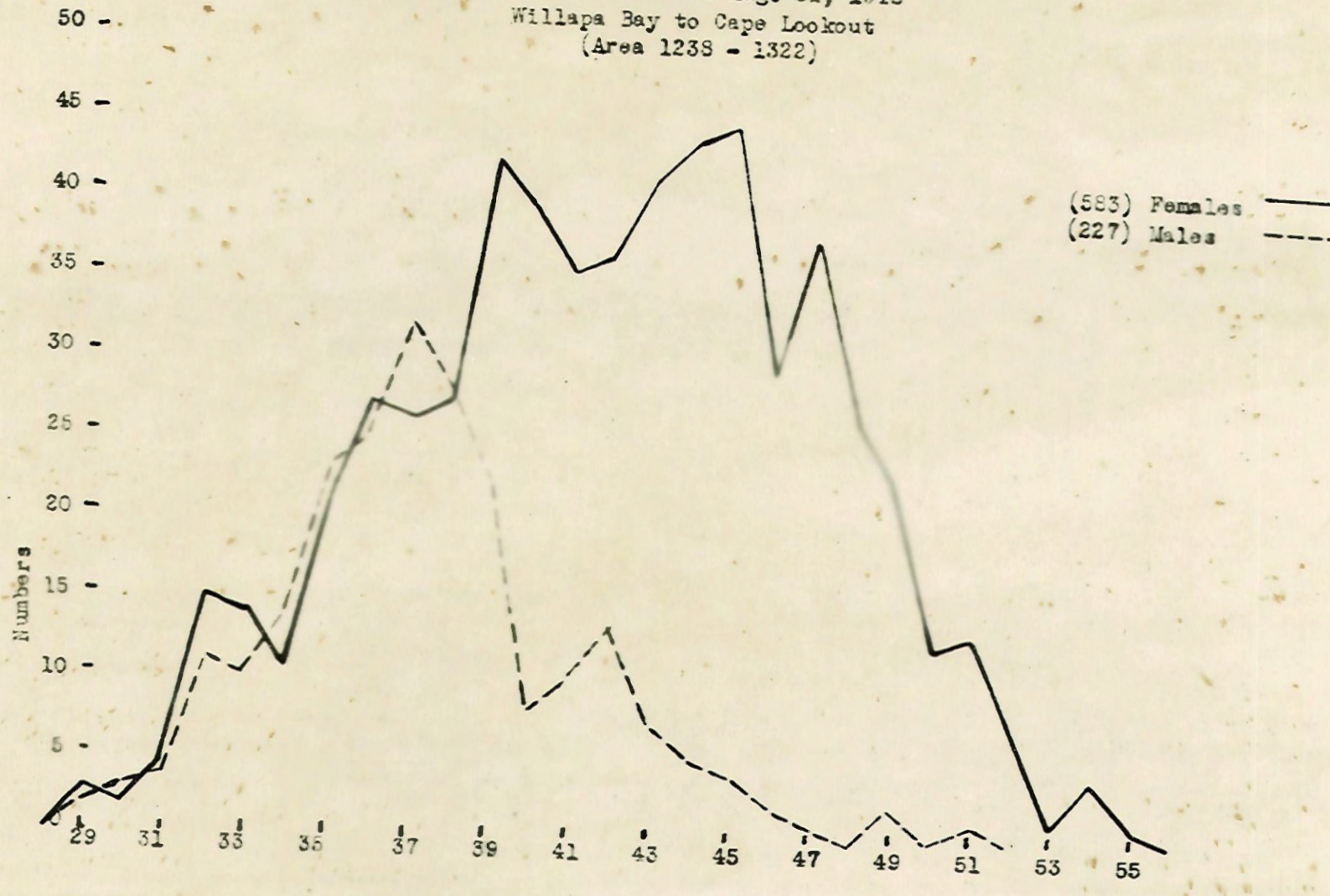


FIGURE FOUR - LENGTH-FREQUENCY
DOVER SOLE

May 11 - August 31, 1948

Willapa Bay to Cape Lookout
(Area 1238 - 1322)

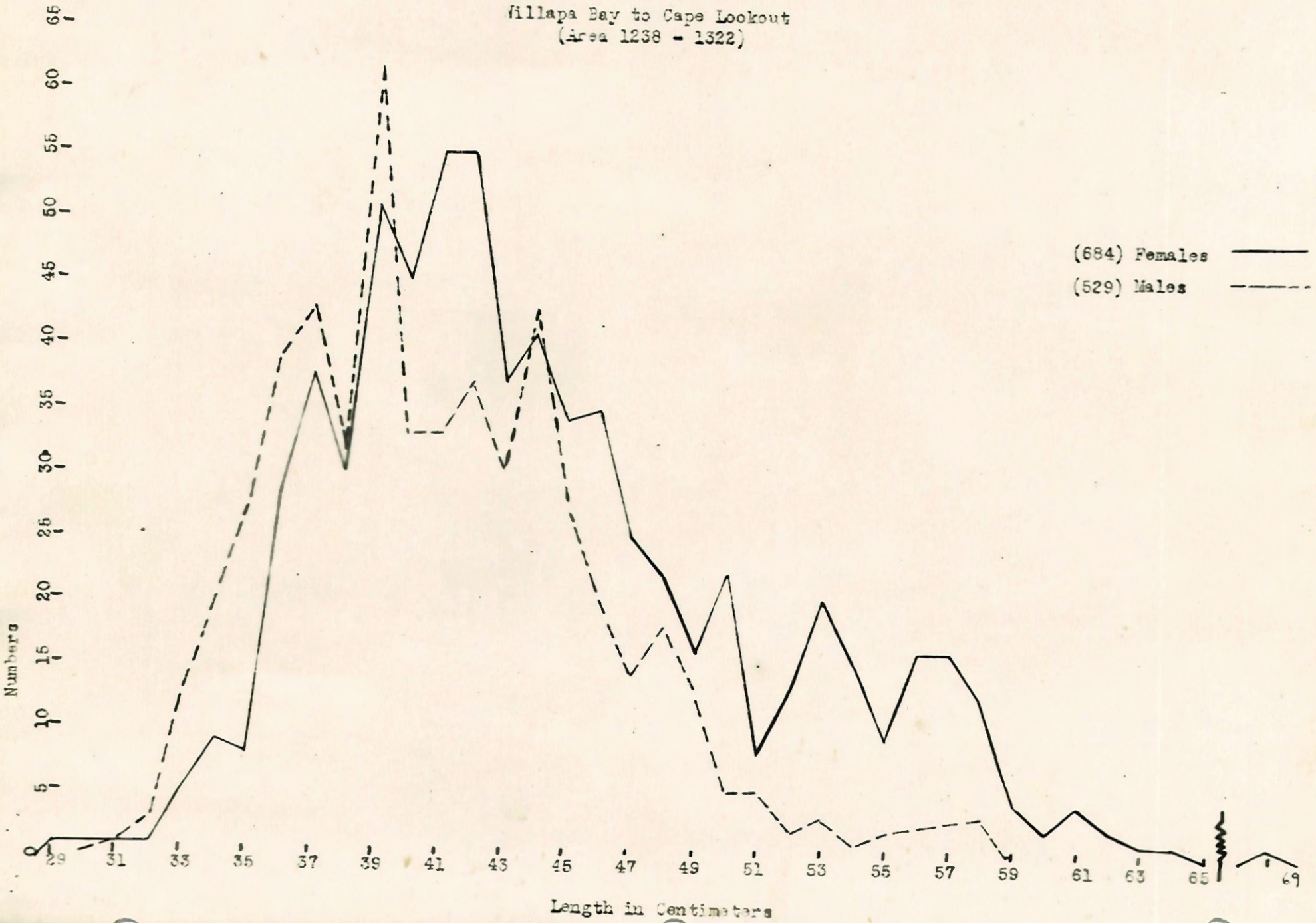
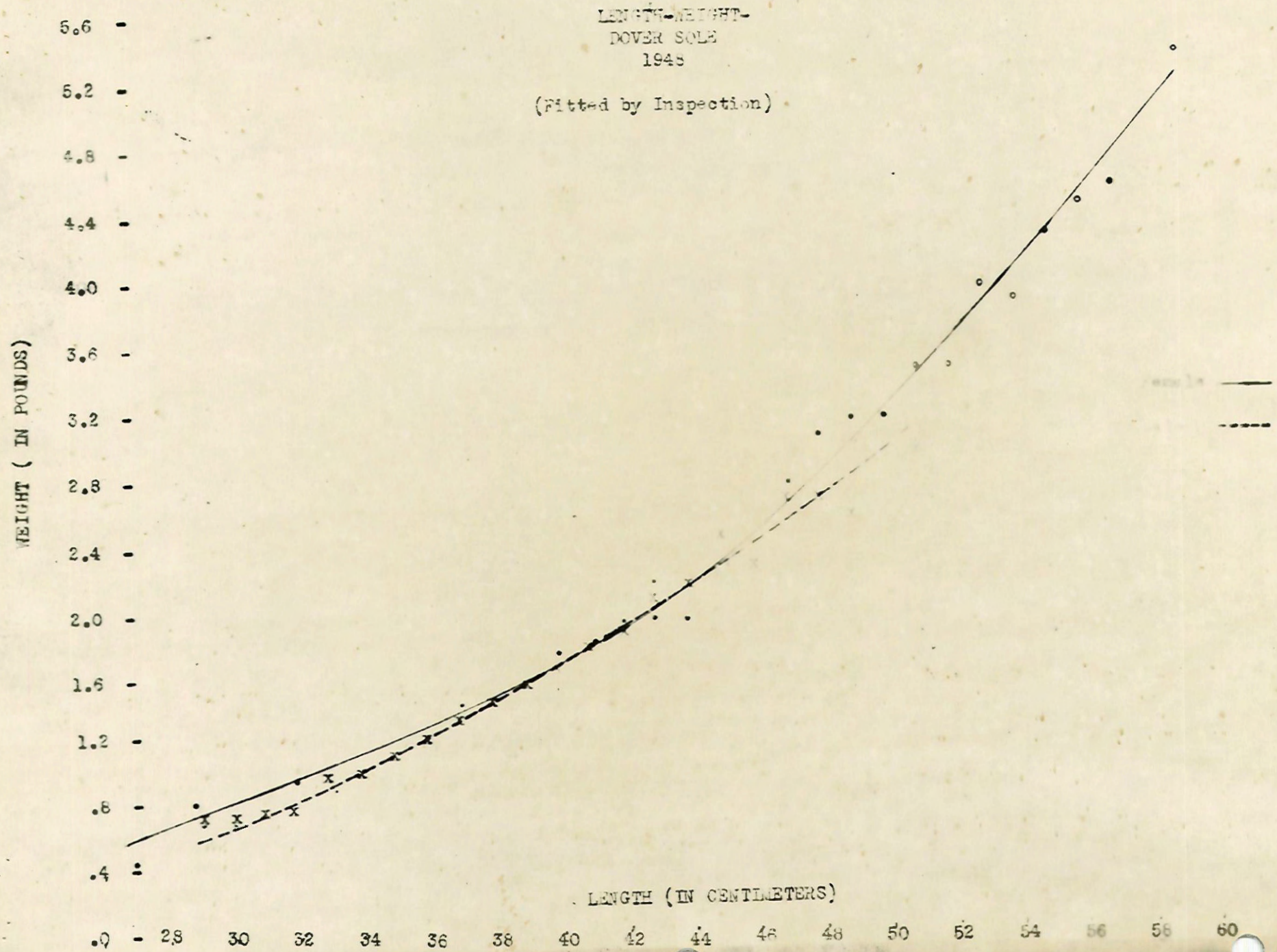


Figure Five

LENGTH-WEIGHT-
DOVER SOLE
1948

(Fitted by Inspection)



--Figure Six

LENGTH-WEIGHT

ENGLISH SOLE

1948--
(Fitted by Inspection)

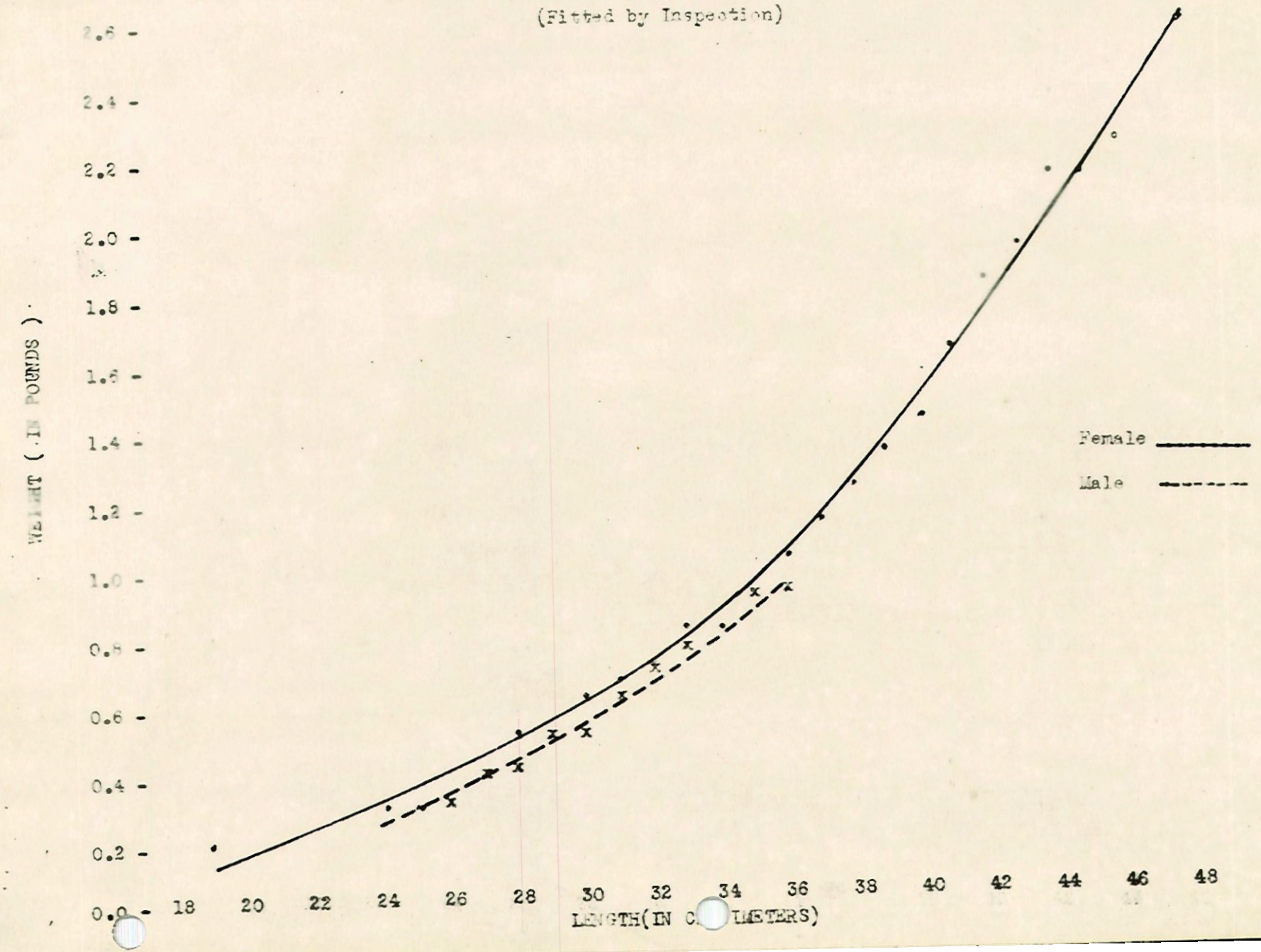


FIGURE SEVEN

AGE COMPOSITION OF
ENGLISH SOLE
Jan. 15 - March 30, 1948

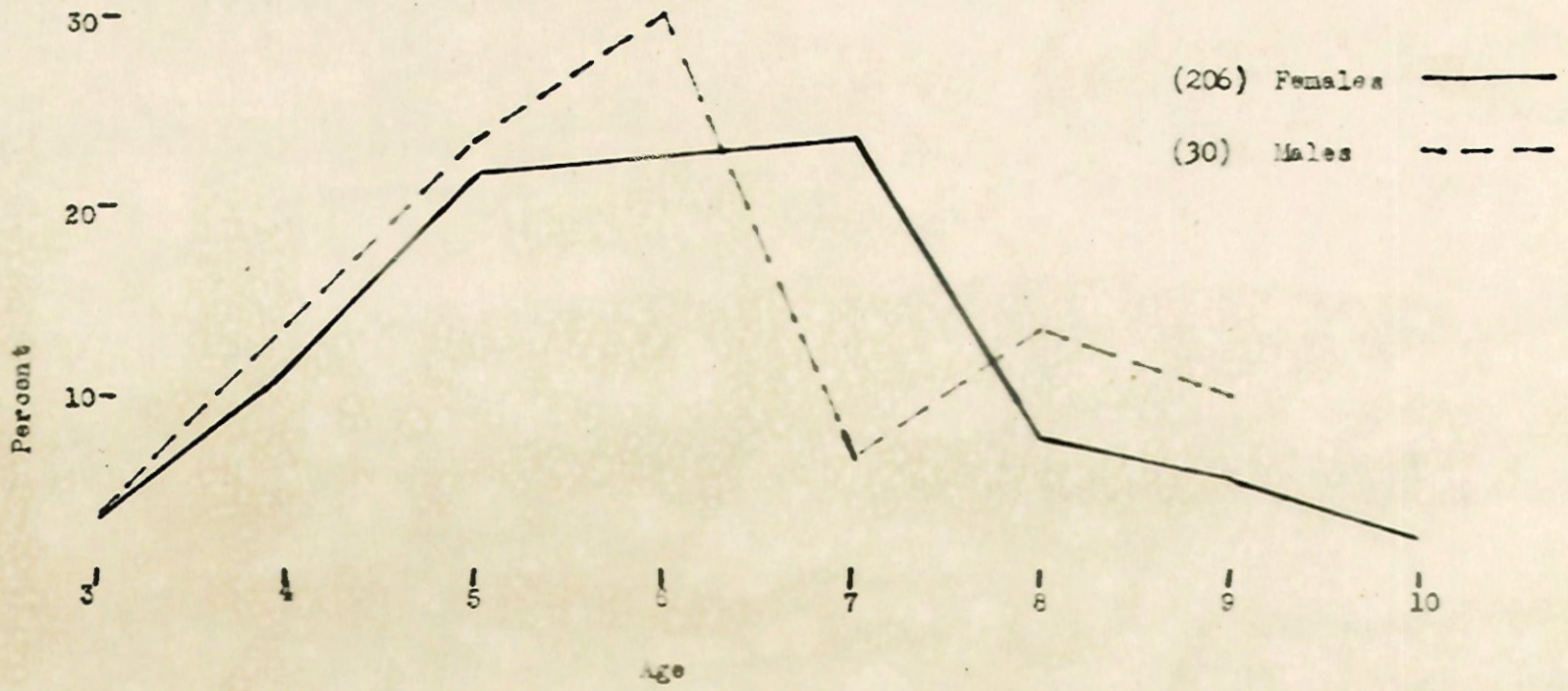


FIGURE EIGHT

AVERAGE LENGTH AT EACH YEAR

ENGLISH SOLE

Jan. 15 - March 30, 1948