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REPORT 35

# AUSTRALIAN CATCHES OF HUMPBACK WHALES

# 1962

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CONTENTS

## SUMMARY

Catch and effort data obtained from humpback whaling operations carried out on the west and east coasts of Australia during 1962 have been analysed and compared with the results from previous years.

The sightings and catches per unit of effort on the west coast of Australia were less in 1962 than in 1961, indicating that this population has continued to diminish in size.

The catch taken from the west coast of Australia during 1962 was of similar composition (length, age, and percentage immature) to that taken in 1961, catching being concentrated upon age groups 3, 4, and 5 years, the members of which are just being recruited into the catchable part of the stock. As most of these recruits are not yet mature, the breeding potential of the remnants of the Group IV population could be eliminated.

The extremely rapid decrease in the size of the Group V population, obvious from 1959 to 1961, continued in 1962. Estimates of the decrease in the size of the vulnerable population (those over 35 ft in length) from 1961 to 1962 ranged from 45% to 68%. The very much reduced catches taken from the east coast of Australia during 1962 contained smaller and younger individuals than the catches of 1961. Catching is now concentrated upon the young recruits as in the case of the Group IV population.

The available evidence indicates that the initial size of the Group V population was less than that of the Group IV population.



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# AUSTRALIAN CATCHES OF HUMPBACK WHALES

## 1962

## I. WEST COAST OF AUSTRALIA (GROUP IV POPULATION)

### (a) Total Catch

The Cheynes Beach Whaling Company, operating near Albany (35°05'S. 117°56'E.), was given a quota of 100 humpback whales in 1962. This company opened whaling in March, operating upon sperm whales. After hunting humpback whales for seven weeks during June and July, sperm whaling was resumed.

The total catch of whales at Albany in 1962 was as follows:-

40 humpback whales
466 sperm whales (to Oct. 20; sperm whaling continuing).

In 1962 the Nor'-West Whaling Company, operating at Carnarvon (24°53'S. 113°38'E.) was allotted an initial quota of 475 humpback whales. After the Cheynes Beach Whaling Company had ceased humpback whaling in favour of sperm whaling, the quota at Carnarvon was increased to 540 humpback whales. However, operations were terminated on September 15 before this quota was filled.

The total catch at Carnarvon in 1962 was as follows:-

503 humpback whales
26 sperm whales.
4 pigmy blue whales
2 sei whales.

### (b) Composition of Catch

(1) Length: During the 1961 whaling season, considerable numbers of small humpback whales, close to the minimum legal length, were included in Australian catches. Prior to the 1962 humpback whaling season, the Australian companies were reminded that the minimum legal length (35 ft) would be enforced strictly. The catches of both male and female humpbacks from the west coast of Australia in 1962 (Tables 1 and 2) contained fewer whales in the 35 ft length group than the catches of 1961. In other respects the length frequency distribution of the catches in 1962 was similar to that of 1961.

The mean lengths of both males and females captured during 1962 were higher than the mean lengths of those taken in 1961, mainly because some small whales were spared during 1962. Figure 1 shows that there was no real recovery in the mean lengths of males and females taken in 1962.

(2) Sexually Immature Whales: Table 3 shows that immature individuals predominated in the catches from the west coast of Australia in 1962, similar to the condition in 1961.

(3) Age: The distribution of ages of whales in the catches taken in 1962 was similar to that of 1961 (Tables 4 and 5), catching being concentrated upon individuals of 3, 4, and 5 years of age. These whales were just being recruited into the vulnerable stock, and have not yet had an opportunity to breed.

The mean ages of the few mature whales (over 5 years of age) captured in 1962 were relatively low (Table 6).

(c) Distribution and Density

(1) Area of Catch: Even less of the Carnarvon station's catch was taken inside Shark Bay in 1962 than in previous seasons (Table 7). The catches of 1961 and 1962 were dispersed similarly (Figures 2 and 3 respectively).

(2) Density: Using either the sightings or the catch per unit of effort as a measure of the density of whales in the hunting area off Albany (Table 8), the density of humpbacks in this region was far less in 1962 than in 1961.

An estimate of the changes in density of humpbacks in the hunting area off Carnarvon cannot be made with the same accuracy as for Albany, because of incompleteness of data. However, during the period from July 1 to August 26 (when humpback whaling was in progress during both 1961 and 1962), the overall rates of catching were 1.66 humpbacks per catcher per day in 1961, and 1.34 per catcher per day in 1962. The density of humpbacks in the hunting area off Carnarvon during 1962 may have been greater than in the hunting area off Albany during the same year, but was less than the density during the same period at Carnarvon in 1961, as shown in Figure 4.

(d) Conclusions

From 1961 to 1962 the size of the Group IV population of humpback whales continued to diminish.

The composition of the catch taken in 1962 was similar in all respects to that of 1961, catching being concentrated upon age groups 3, 4, and 5 years, the members of which are just being recruited into the catchable part of the stock. Most of these whales are not yet mature.

Both whaling stations on the west coast of Australia are now largely dependent upon other fisheries for their income, and could not operate profitably on humpback whales alone. In the absence of other fisheries (sperm whaling off Albany, prawning off Carnarvon, and fin whaling in the Antarctic) the Group IV population of humpback whales would no doubt be left until it had recovered sufficiently to support again a profitable industry. However, in the presence of these other fisheries, humpback whales continue to to be taken from the residue of this population. If this continues, there is a real possibility that this population could be extinguished.

## II. EAST COAST OF AUSTRALIA (GROUP V POPULATION)

### (a) Total Catch

Whale Products Pty Ltd, operating the land station at Tangalooma, Moreton Island (27°11'S. 153°23'E.), was allotted a quota of 600 humpback whales in 1962. Hunting began on June 18, using two catchers newer and more powerful than the two catchers which had been used for some years. A light aircraft was also used for whale spotting. Operations were terminated on August 5, with a total catch of 68 humpback whales.

The Byron Whaling Company at Byron Bay (28°37'S. 153°38'E.) was given a quota of 150 humpback whales in 1962. This station opened on June 8, using the same catcher as in 1961. Operations were halted from August 7 to 26, humpback whales being very scarce in this region during the interval between the northward and southward migration. During September and October the catcher from Norfolk Island operated at Byron Bay. The station closed on October 27, with a total catch of 105 humpback whales and two Bryde's whales.

Hunting for whales off Norfolk Island (29°01'S. 167°58'E.) was commenced on June 14. The allotted quota was 170 humpback whales. Few whales were seen, and operations ceased on August 2 with a total catch of four humpback whales.

### (b) Composition of Catch

(1) Length: Small individuals predominated amongst the few humpback whales taken on the east coast of Australia during 1962

(Tables 9 and 10). The mean lengths of both males and females were less than in any previous years, continuing the downward trend which has occurred since 1959 (Figure 5).

(2) Sexually Immature Whales: Table 11 shows that in 1962 there was an increase in the percentage of immature males in the catch while the percentage of immature females remained at the high level of 1961. The percentages of immature humpback whales in the catches from the east coast of Australia are now almost as high as those of the catches on the west coast (cf. Tables 11 and 3 respectively).

(3) Age: Catches from the east coast of Australia during 1962 contained a higher proportion of younger individuals than in previous years, the majority of the whales now being from 3 to 6 years of age when killed (Tables 12 and 13). Few of these would have had an opportunity to breed.

The few mature males and females (over 5 years of age) captured in 1962 were of lower mean age than those taken in previous years (Table 6).

## (c) Density

The results of the operations of the two catchers at Tangalooma during 1962 are summarized in Table 14. Comparison of these results with those of the same weeks of operations at Tangalooma in 1961 (see Chittleborough 1962, Tables 3 and 4), shows that the sightings per 100 hunting hours decreased by 56% from 1961 to 1962, and the catch per 100 hunting hours declined by 63%. These percentages reflect the decrease in the total population and in the vulnerable population (over 35 ft length) respectively. The decline in the density of whales may have been even greater than indicated by these results, because the faster, more powerful catchers used in 1962 were no doubt more efficient than those used in previous years, so masking to some extent the decrease in availability of whales.

Figure 4 illustrates the rapid decline in density of humpback whales off the east coast of Australia since 1959, using the mean catch per hunting hour by the catchers at Tangalooma, during the same period (June 10 - August 5) each year, as an index of density.

The results of the operations by Master/Gunner L. Mills at Byron Bay during 1962 are summarized in Table 15, and Figure 6. When compared with the corresponding data from 1961 (Chittleborough 1962, Table 5, Figure 5), these results show that while the times of northward and southward migration were similar in the two years, the density of humpback whales was lower in 1962 than in 1961. Using the results from

the same periods in each year (June 19 to August 6, and August 28 to October 29), the catch of humpbacks per hunting hour decreased by 45% from 1961 to 1962. This is another measure of the decrease in the vulnerable population from 1961 to 1962.

### (d) Conclusions

From 1961 to 1962 the Group V population of humpback whales continued to decline in size and age composition, catching now being concentrated upon the young recruits as in the case of the Group IV population.

The extremely rapid decrease in the size of this population, obvious since 1959, has continued. Estimates of the decrease in the size of the vulnerable population (over 35 ft in length) from 1961 to 1962 range from 45% to 68%.

If all the catches from these populations in recent years have been reported, the evidence indicates that the initial size of the Group V population must have been smaller than the initial size of the Group IV population of humpback whales.

## III. ACKNOWLEDGMENTS

The co-operation of the whaling companies, enabling data to be collected at their respective whaling stations, from their catchers and aircraft, is gratefully acknowledged.

Inspectors of the Department of Primary Industry, the Western Australian Fisheries and Game Department, and the Queensland Department of Harbours and Marine assisted greatly the collection of material.

## IV. REFERENCES

Chittleborough, R.G. (1962).- Australian catches of humpback whales 1961. C.S.I.R.O. Aust. Div. Fish. Oceanogr. Rep. No. 34.

## TABLE 1

## GROUP IV POPULATION OF HUMPBACK WHALES

## DISTRIBUTION OF LENGTHS WITHIN CATCHES FROM THE WEST COAST OF AUSTRALIA

## MALES

| Length (ft) | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | | | | 1 | | 1 | | | | | | | 1 | |
| 31 | | 1 | | | | | | | | | | | | |
| 32 | | 2 | | 1 | 4 | | | | | 1 | | | 2 | 2 |
| 33 | | | 5 | 3 | 4 | | | 2 | | | 4 | 4 | 3 | 1 |
| 34 | | | | 5 | 1 | | 1 | | 4 | 2 | 3 | 3 | 6 | 1 |
| 35 | 1 | 5 | 17 | 38 | 49 | 46 | 16 | 11 | 13 | 20 | 24 | 14 | 56 | 28 |
| 36 | 3 | 10 | 38 | 36 | 62 | 72 | 27 | 28 | 28 | 27 | 46 | 27 | 51 | 46 |
| 37 | 11 | 15 | 64 | 71 | 84 | 87 | 35 | 30 | 40 | 48 | 59 | 54 | 58 | 79 |
| 38 | 18 | 16 | 81 | 72 | 112 | 127 | 60 | 55 | 77 | 68 | 70 | 62 | 59 | 53 |
| 39 | 23 | 38 | 133 | 106 | 111 | 113 | 98 | 78 | 98 | 82 | 57 | 50 | 41 | 46 |
| 40 | 16 | 51 | 167 | 97 | 96 | 84 | 133 | 131 | 102 | 102 | 35 | 25 | 18 | 25 |
| 41 | 20 | 41 | 167 | 88 | 66 | 61 | 63 | 114 | 69 | 64 | 15 | 18 | 6 | 15 |
| 42 | 20 | 41 | 108 | 66 | 68 | 51 | 69 | 102 | 71 | 47 | 8 | 7 | 3 | 5 |
| 43 | 12 | 17 | 72 | 52 | 28 | 23 | 42 | 72 | 38 | 29 | 2 | 5 | 1 | 3 |
| 44 | 6 | 8 | 37 | 18 | 21 | 18 | 19 | 29 | 27 | 10 | 3 | 2 | 1 | |
| 45 | 4 | 4 | 15 | 8 | 16 | 6 | 12 | 18 | 13 | 6 | 3 | | | |
| 46 | 1 | 1 | 3 | 3 | 4 | 3 | 4 | 2 | 3 | 2 | 1 | | | |
| 47 | | | | 1 | | | 1 | 3 | | 1 | 1 | | | |
| 48 | | | | | | | | 1 | | | | | | |
| Total | 135 | 250 | 907 | 666 | 726 | 692 | 580 | 676 | 583 | 509 | 331 | 271 | 306 | 304 |
| Mean Length (ft) | 40.36 | 40.10 | 40.11 | 39.48 | 39.05 | 38.77 | 39.88 | 40.35 | 39.78 | 39.35 | 37.93 | 37.97 | 36.96 | 37.60 |

TABLE 2

GROUP IV POPULATION OF HUMPBACK WHALES

DISTRIBUTION OF LENGTHS WITHIN CATCHES FROM THE WEST COAST OF AUSTRALIA

FEMALES

| Length (ft) | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29 | | | | 1 | 1 | | 2 | | | | | | | |
| 30 | | | | 1 | 2 | | | | | | | | | |
| 31 | | | | 1 | 2 | | 1 | | | | | | | |
| 32 | 1 | 1 | | | 1 | 1 | | 1 | | | 1 | 1 | 1 | |
| 33 | 1 | | 1 | 1 | | 3 | 2 | 1 | | | 2 | 3 | 6 | 3 |
| 34 | | 1 | 1 | | | | | | 1 | 1 | 2 | 1 | | 1 |
| 35 | 1 | 4 | 12 | 17 | 36 | 42 | 7 | 6 | 2 | 10 | 26 | 12 | 34 | 17 |
| 36 | 3 | 9 | 9 | 27 | 33 | 48 | 13 | 11 | 18 | 10 | 30 | 24 | 39 | 19 |
| 37 | 1 | 8 | 25 | 31 | 41 | 46 | 20 | 7 | 26 | 17 | 22 | 28 | 35 | 42 |
| 38 | 4 | 7 | 26 | 21 | 58 | 62 | 38 | 13 | 28 | 30 | 42 | 42 | 35 | 43 |
| 39 | 5 | 10 | 27 | 43 | 51 | 53 | 48 | 33 | 56 | 47 | 35 | 24 | 31 | 27 |
| 40 | 1 | 16 | 38 | 48 | 47 | 63 | 70 | 58 | 59 | 64 | 55 | 25 | 28 | 21 |
| 41 | 5 | 12 | 33 | 61 | 53 | 42 | 54 | 37 | 55 | 52 | 46 | 27 | 13 | 26 |
| 42 | 12 | 21 | 36 | 62 | 55 | 53 | 58 | 48 | 63 | 53 | 30 | 28 | 19 | 12 |
| 43 | 6 | 15 | 38 | 62 | 52 | 61 | 60 | 53 | 77 | 61 | 24 | 23 | 12 | 6 |
| 44 | 5 | 9 | 29 | 53 | 57 | 57 | 55 | 68 | 55 | 45 | 16 | 12 | 9 | 10 |
| 45 | 6 | 11 | 17 | 36 | 27 | 33 | 39 | 43 | 34 | 29 | 19 | 10 | 7 | 7 |
| 46 | 2 | 9 | 10 | 27 | 29 | 32 | 39 | 26 | 39 | 20 | 10 | 5 | 1 | 3 |
| 47 | 1 | 2 | 4 | 14 | 17 | 9 | 23 | 20 | 17 | 11 | 4 | 6 | 1 | |
| 48 | | 2 | 2 | 7 | 8 | 7 | 9 | 10 | 5 | 8 | 5 | 1 | 1 | |
| 49 | 1 | | 1 | 1 | 1 | 3 | 3 | 7 | 1 | | | 2 | | 1 |
| 50 | | | 1 | 2 | | 1 | 2 | 1 | | | | | | 1 |
| 51 | | | | | | | | | | | | | | |
| 52 | | | | | | 1 | | | | | | | | |
| Total | 55 | 137 | 310 | 516 | 571 | 617 | 543 | 443 | 536 | 458 | 369 | 274 | 272 | 239 |
| Mean Length (ft) | 41.43 | 41.15 | 40.92 | 41.35 | 40.67 | 40.50 | 41.72 | 42.32 | 41.62 | 41.33 | 39.88 | 39.73 | 38.35 | 39.18 |

TABLE 3

IMMATURE WHALES IN SAMPLES OF CATCHES FROM THE WEST COAST OF AUSTRALIA

| Year | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|
| | Total catch | Number weighed | Testes weight < 4 kg | | Total catch | Number examined | Immature and Puberal | |
| | | | No. | % | | | No. | % |
| 1951 | 907 | 395 | 36 | 9.1 | 310 | 90 | 20 | 22.2 |
| 1952 | 666 | 161 | 35 | 21.7 | 516 | 278 | 59 | 21.2 |
| 1953 | 726 | 111 | 37 | 33.3 | 569 | 246 | 93 | 37.8 |
| 1954 | 692 | - | - | - | 617 | 150 | 44 | 29.3 |
| 1955 | 580 | - | - | - | 538 | - | - | - |
| 1956 | 676 | - | - | - | 443 | 279 | 34 | 12.2 |
| 1957 | 583 | 488 | 66 | 13.5 | 536 | 521 | 134 | 25.7 |
| 1958 | 509 | 439 | 79 | 18.0 | 458 | 438 | 114 | 26.0 |
| 1959 | 331 | 254 | 88 | 34.6 | 369 | 352 | 124 | 35.2 |
| 1960 | 271 | 208 | 54 | 26.0 | 274 | 263 | 120 | 45.6 |
| 1961 | 306 | 291 | 137 | 47.1 | 272 | 263 | 157 | 59.7 |
| 1962 | 304 | 280 | 142 | 50.7 | 239 | 230 | 129 | 56.1 |

TABLE 4

ESTIMATED DISTRIBUTION OF AGE IN ANNUAL CATCHES OF MALE HUMPBACKS

WEST COAST OF AUSTRALIA 1949-1962

| Age (yrs) | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 0 | 3 | 3 | 7 | 8 | 6 | 2 | 2 | 3 | 7 | 5 | 4 | 7 | 6 |
| 3 | 4 | 11 | 40 | 54 | 72 | 70 | 28 | 25 | 27 | 29 | 17 | 50 | 76 | 88 |
| 4 | 12 | 20 | 81 | 81 | 110 | 118 | 55 | 50 | 67 | 70 | 77 | 54 | 82 | 72 |
| 5 | 20 | 34 | 129 | 101 | 119 | 123 | 87 | 85 | 125 | 115 | 67 | 67 | 56 | 85 |
| 6 | 19 | 36 | 131 | 96 | 106 | 106 | 90 | 91 | 81 | 106 | 71 | 37 | 39 | 17 |
| 7 | 13 | 25 | 92 | 60 | 63 | 61 | 60 | 66 | 77 | 45 | 34 | 18 | 24 | 16 |
| 8 | 9 | 18 | 66 | 42 | 40 | 37 | 40 | 49 | 45 | 25 | 24 | 13 | 7 | 8 |
| 9 | 9 | 18 | 65 | 40 | 39 | 34 | 39 | 51 | 39 | 43 | 5 | 8 | 6 | 3 |
| 10 | 6 | 12 | 41 | 26 | 24 | 21 | 25 | 33 | 26 | 5 | 10 | 5 | 5 | 2 |
| 11 | 6 | 11 | 37 | 22 | 21 | 17 | 22 | 30 | 17 | 15 | 8 | 2 | | 4 |
| 12 | 5 | 9 | 31 | 19 | 17 | 15 | 18 | 25 | 4 | 12 | 3 | 3 | | |
| 13 | 5 | 9 | 33 | 21 | 18 | 15 | 20 | 28 | 15 | 17 | 1 | | 2 | |
| 14 | 3 | 5 | 17 | 10 | 9 | 8 | 11 | 15 | 13 | 4 | | 3 | | |
| 15 | 2 | 4 | 14 | 9 | 8 | 6 | 8 | 12 | 6 | | | | | |
| 16 | 3 | 5 | 19 | 11 | 11 | 9 | 11 | 17 | 4 | 6 | | | 1 | |
| 17 | 3 | 4 | 17 | 10 | 9 | 7 | 10 | 14 | 3 | | | 2 | 1 | |
| 18 | 2 | 3 | 11 | 7 | 5 | 4 | 6 | 9 | | | | | | 2 |
| 19 | 2 | 3 | 10 | 6 | 6 | 4 | 6 | 9 | 4 | | | | | |
| 20 | 1 | 2 | 8 | 5 | 5 | 4 | 4 | 6 | 6 | | 3 | | | 1 |
| 20+ | 11 | 18 | 62 | 39 | 36 | 27 | 38 | 59 | 21 | 10 | 6 | 5 | | |
| Total catch | 135 | 250 | 907 | 666 | 726 | 692 | 580 | 676 | 583 | 509 | 331 | 271 | 306 | 304 |

Using separate ear plug age/length keys of individual samples in each of 1957, 1958, 1959, 1960, 1961, and 1962. For period 1949-1956, using combined age/length key, 1956-1961.

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## TABLE 5

### ESTIMATED DISTRIBUTION OF AGE IN ANNUAL CATCHES OF FEMALE HUMPBACKS

### WEST COAST OF AUSTRALIA 1949-62

| Age (yrs) | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 0 | 0 | 1 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 3 | 4 | 11 | 27 | 40 | 58 | 66 | 41 | 26 | 40 | 36 | 45 | 36 | 49 | 41 |
| 4 | 4 | 12 | 29 | 43 | 63 | 72 | 45 | 29 | 44 | 39 | 49 | 39 | 53 | 45 |
| 5 | 4 | 12 | 28 | 43 | 61 | 70 | 44 | 28 | 43 | 39 | 48 | 38 | 52 | 44 |
| 6 | 4 | 13 | 33 | 44 | 54 | 60 | 57 | 42 | 58 | 52 | 50 | 35 | 33 | 31 |
| 7 | 4 | 12 | 29 | 44 | 47 | 52 | 67 | 54 | 67 | 62 | 37 | 25 | 21 | 22 |
| 8 | 4 | 9 | 22 | 34 | 37 | 38 | 45 | 37 | 46 | 40 | 26 | 19 | 14 | 14 |
| 9 | 5 | 11 | 26 | 43 | 41 | 41 | 34 | 29 | 36 | 31 | 20 | 15 | 11 | 13 |
| 10 | 3 | 7 | 15 | 26 | 23 | 25 | 27 | 24 | 28 | 24 | 13 | 8 | 6 | 5 |
| 11 | 4 | 8 | 18 | 32 | 30 | 30 | 24 | 21 | 24 | 19 | 13 | 9 | 6 | 4 |
| 12 | 3 | 7 | 15 | 27 | 24 | 24 | 17 | 15 | 18 | 14 | 14 | 10 | 6 | 3 |
| 13 | 3 | 6 | 11 | 22 | 20 | 21 | 16 | 16 | 16 | 12 | 8 | 6 | 4 | 2 |
| 14 | 2 | 4 | 9 | 16 | 14 | 15 | 16 | 15 | 16 | 13 | 5 | 4 | 2 | 1 |
| 15 | 1 | 3 | 6 | 12 | 11 | 11 | 16 | 16 | 16 | 12 | 4 | 3 | 2 | 0 |
| 16 | 2 | 6 | 11 | 23 | 21 | 24 | 21 | 20 | 21 | 16 | 9 | 6 | 3 | 2 |
| 17 | 0 | 1 | 2 | 4 | 4 | 5 | 13 | 12 | 12 | 10 | 4 | 2 | 1 | 3 |
| 18 | 1 | 2 | 3 | 6 | 5 | 6 | 13 | 13 | 10 | 8 | 4 | 2 | 2 | 1 |
| 19 | 1 | 0 | 1 | 2 | 2 | 2 | 6 | 6 | 6 | 5 | 1 | 1 | 0 | 1 |
| 20 | 1 | 1 | 2 | 5 | 5 | 5 | 7 | 6 | 6 | 4 | 2 | 1 | 0 | 1 |
| 20+ | 5 | 12 | 22 | 48 | 48 | 47 | 32 | 33 | 27 | 20 | 15 | 13 | 5 | 4 |
| Total catch | 55 | 137 | 310 | 516 | 571 | 617 | 543 | 444 | 536 | 458 | 369 | 274 | 272 | 239 |

Using separate ovary/length keys, 1949-54, 1955-58, 1959-61, 1962, on length frequency of catches. Ovary group "0" converted to age on ear plug data.

TABLE 6

MEAN AGES OF ADULT HUMPBACKS (OVER 5 YRS) IN SAMPLES FROM THE WEST AND EAST COASTS OF AUSTRALIA

(Based on ear plug laminations)

| | | Adult Males | | Adult Females | |
|---|---|---|---|---|---|
| | | No. examined | Mean age (yrs) | No. examined | Mean age (yrs) |
| West Coast | 1957 | 111 | 10.47 | 1.43 | 10.69 |
| | 1958 | 136 | 8.80 | 1.49 | 10.66 |
| | 1959 | 91 | 8.02 | 1.37 | 10.08 |
| | 1960 | 52 | 8.81 | 82 | 10.66 |
| | 1961 | 65 | 7.45 | 82 | 8.74 |
| | 1962 | 36 | 8.00 | 50 | 8.58 |
| East Coast | 1957 | 157 | 14.82 | 75 | 14.07 |
| | 1958 | 80 | 14.63 | 46 | 11.28 |
| | 1959 | 214 | 12.76 | 105 | 12.85 |
| | 1960 | 204 | 11.89 | 138 | 12.06 |
| | 1961 | 187 | 11.87 | 85 | 10.66 |
| | 1962 | 33 | 10.48 | 22 | 8.73 |


Fig. 1.- Mean lengths of annual catches of male and female humpbacks from the west coast of Australia.

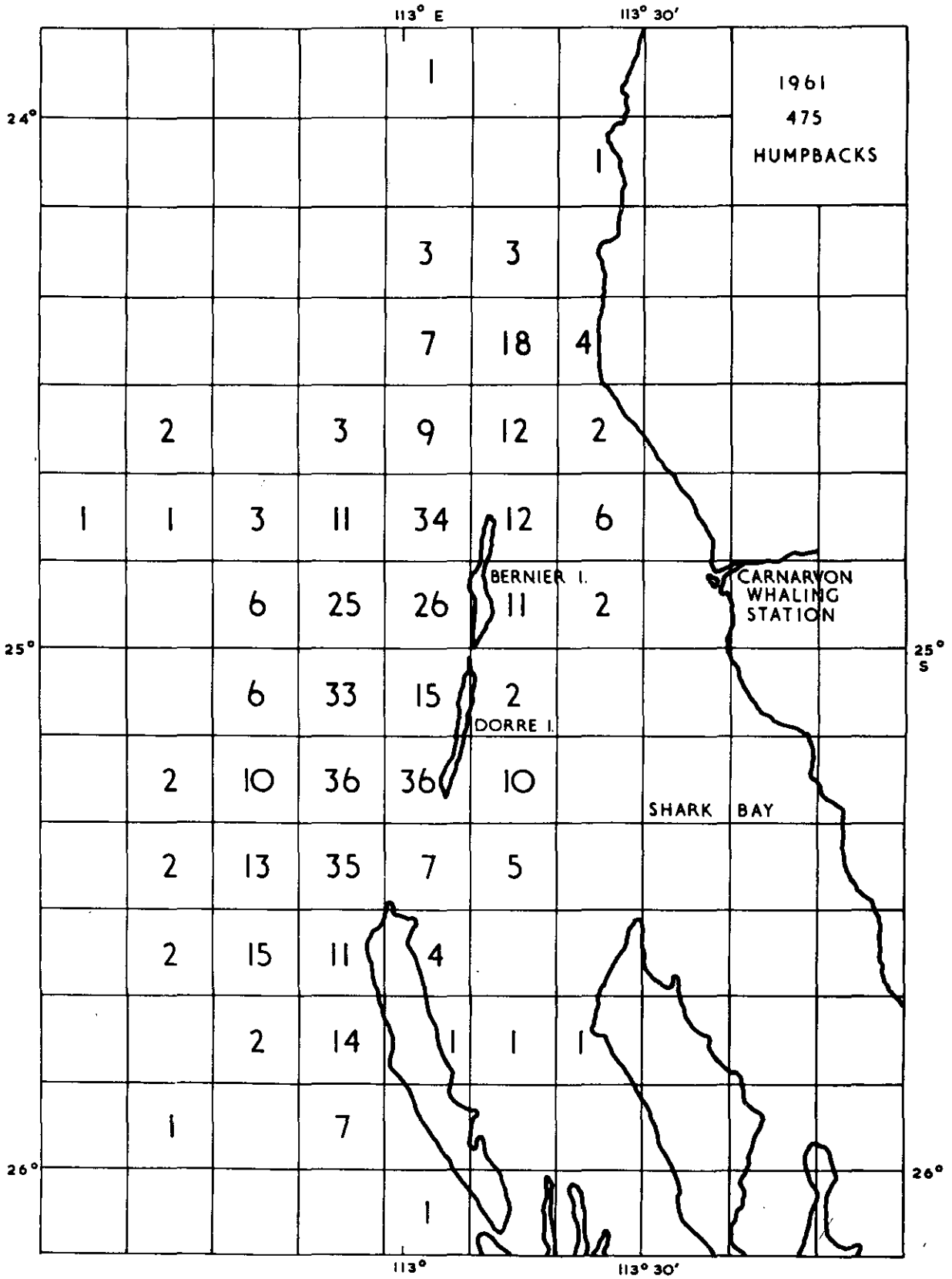


Fig. 2.- Area off Carnarvon Whaling Station marked in squares, 10 x 10 nautical miles, showing in each square number of humpbacks killed in 1961.

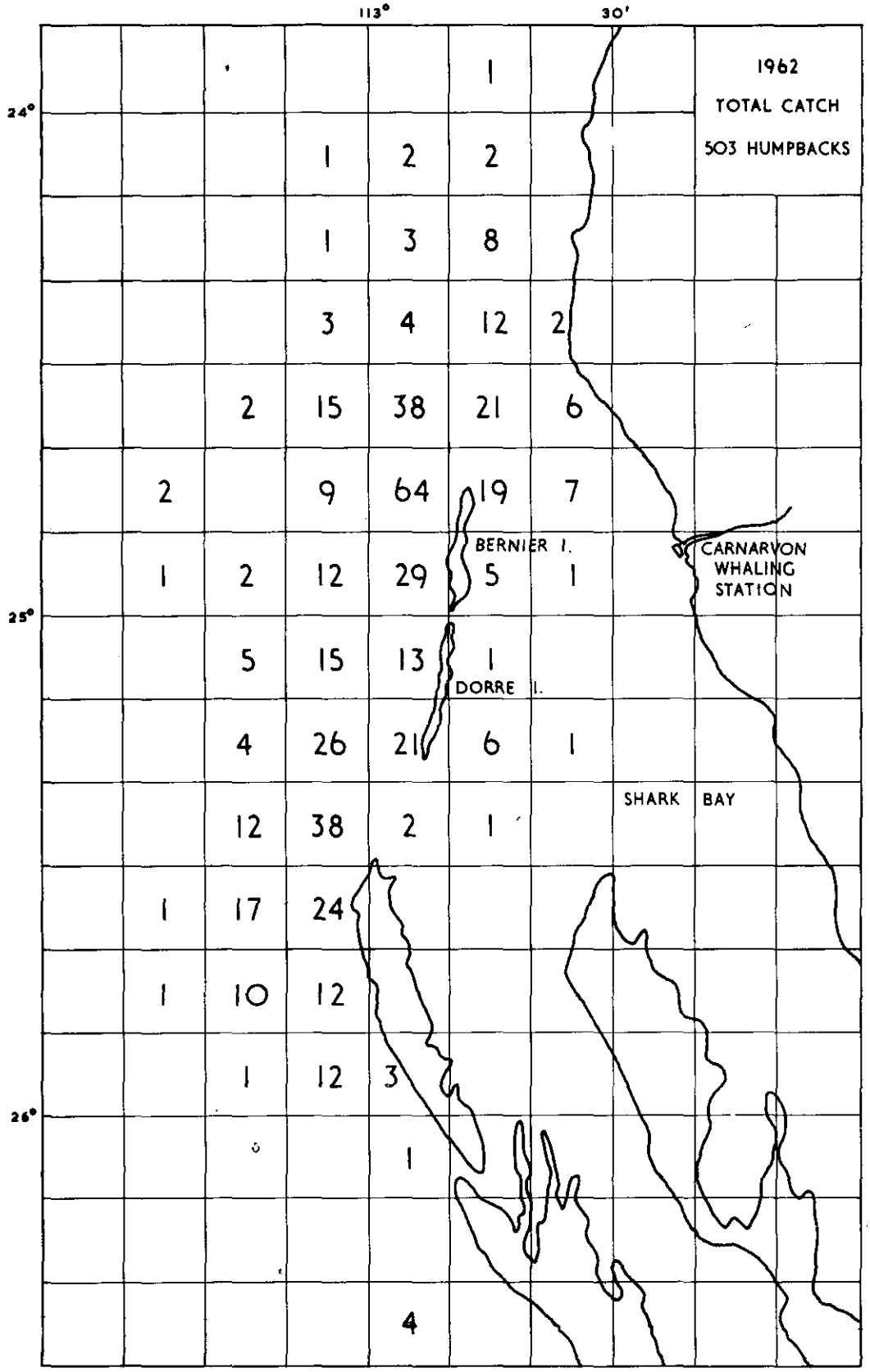


Fig. 3.- Area off Carnarvon Whaling Station marked in squares, 10 x 10 nautical miles, showing in each square number of humpbacks killed in 1962.

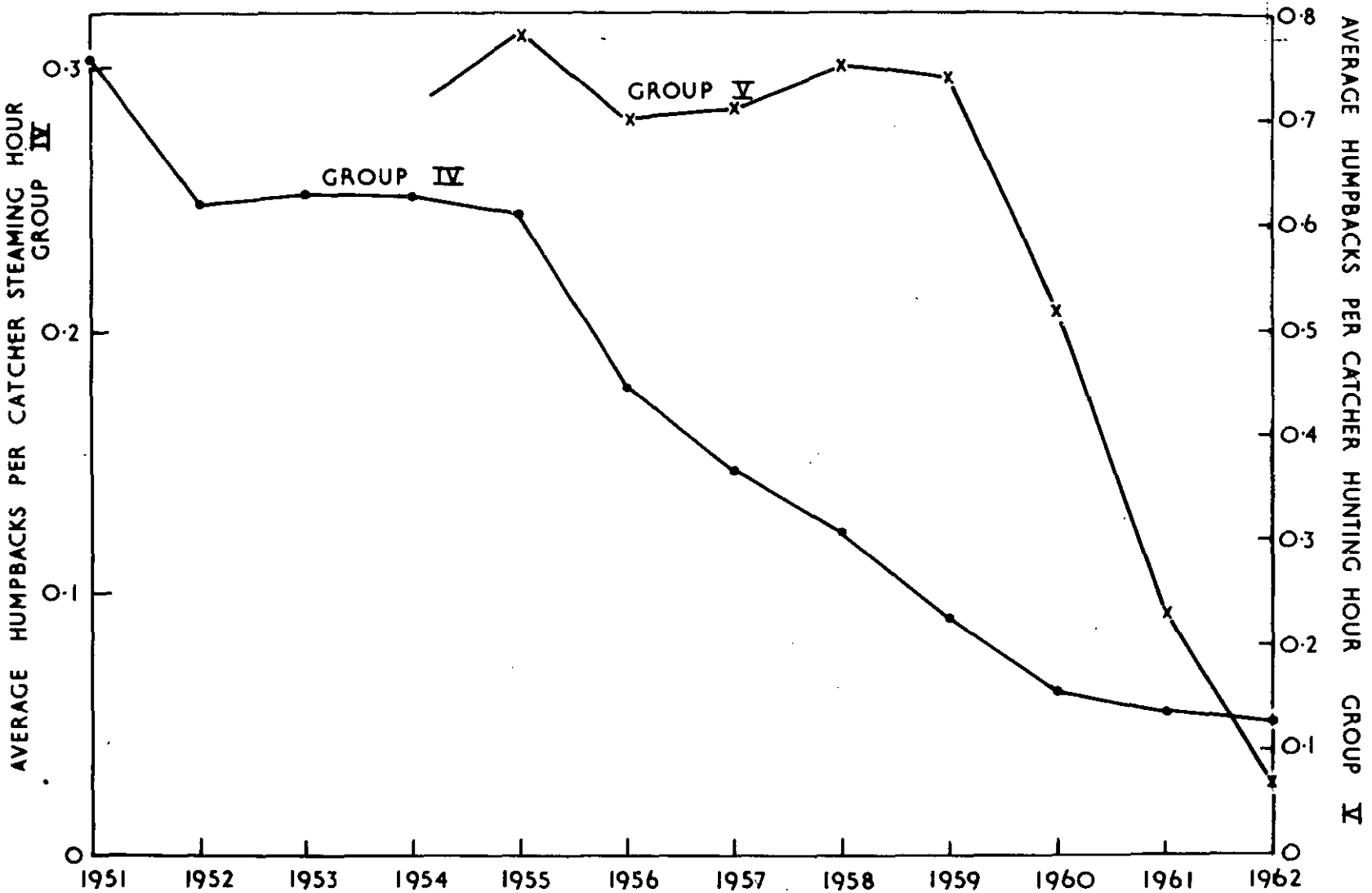


Fig. 4.- Relative densities (catch per unit of effort) of humpbacks each year on west and east coasts of Australia (Group IV and V populations respectively). Same vessels and same period of time in each year.

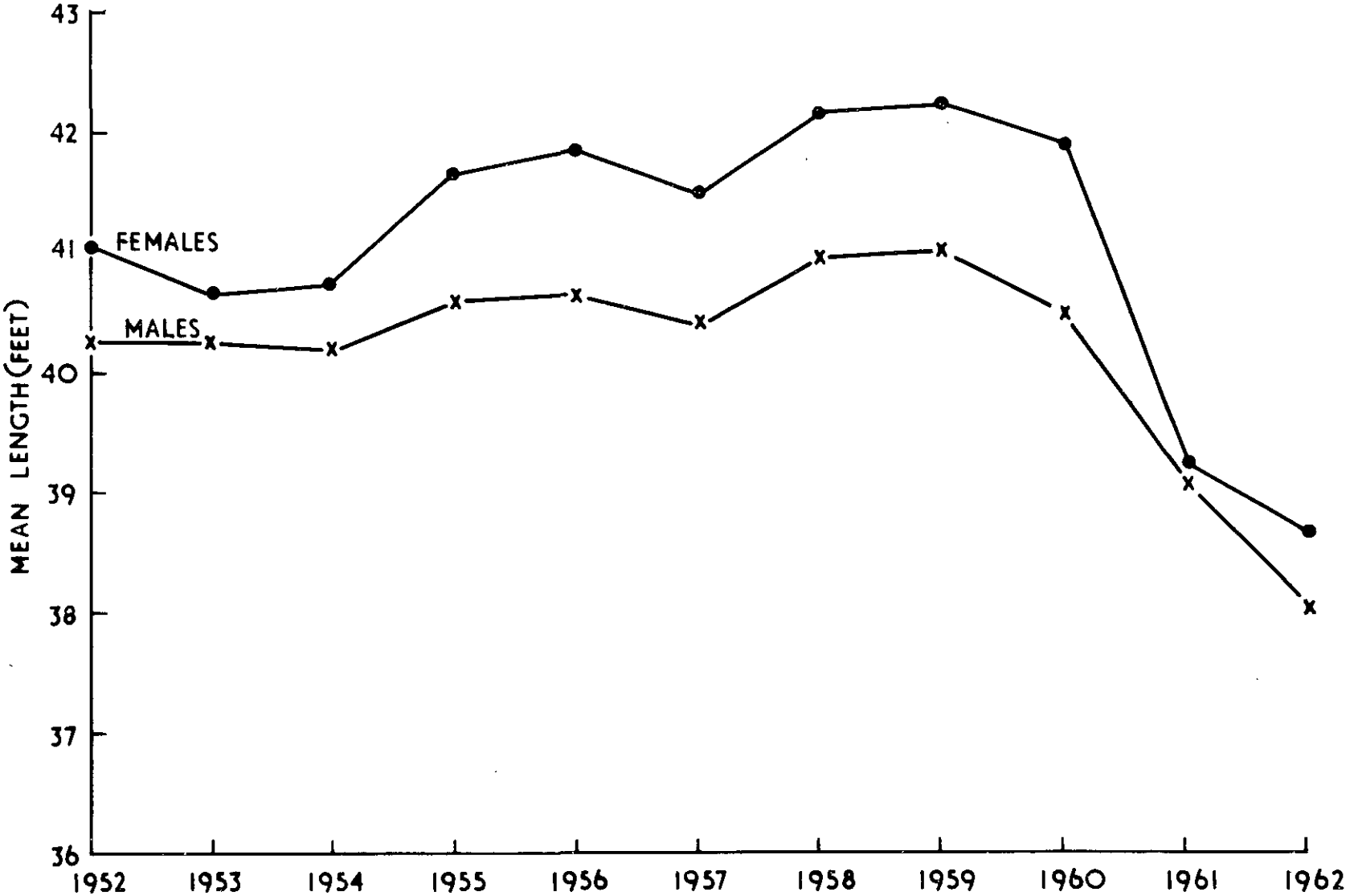


Fig. 5.- Mean lengths of annual catches of male and female humpbacks from the east coast of Australia.

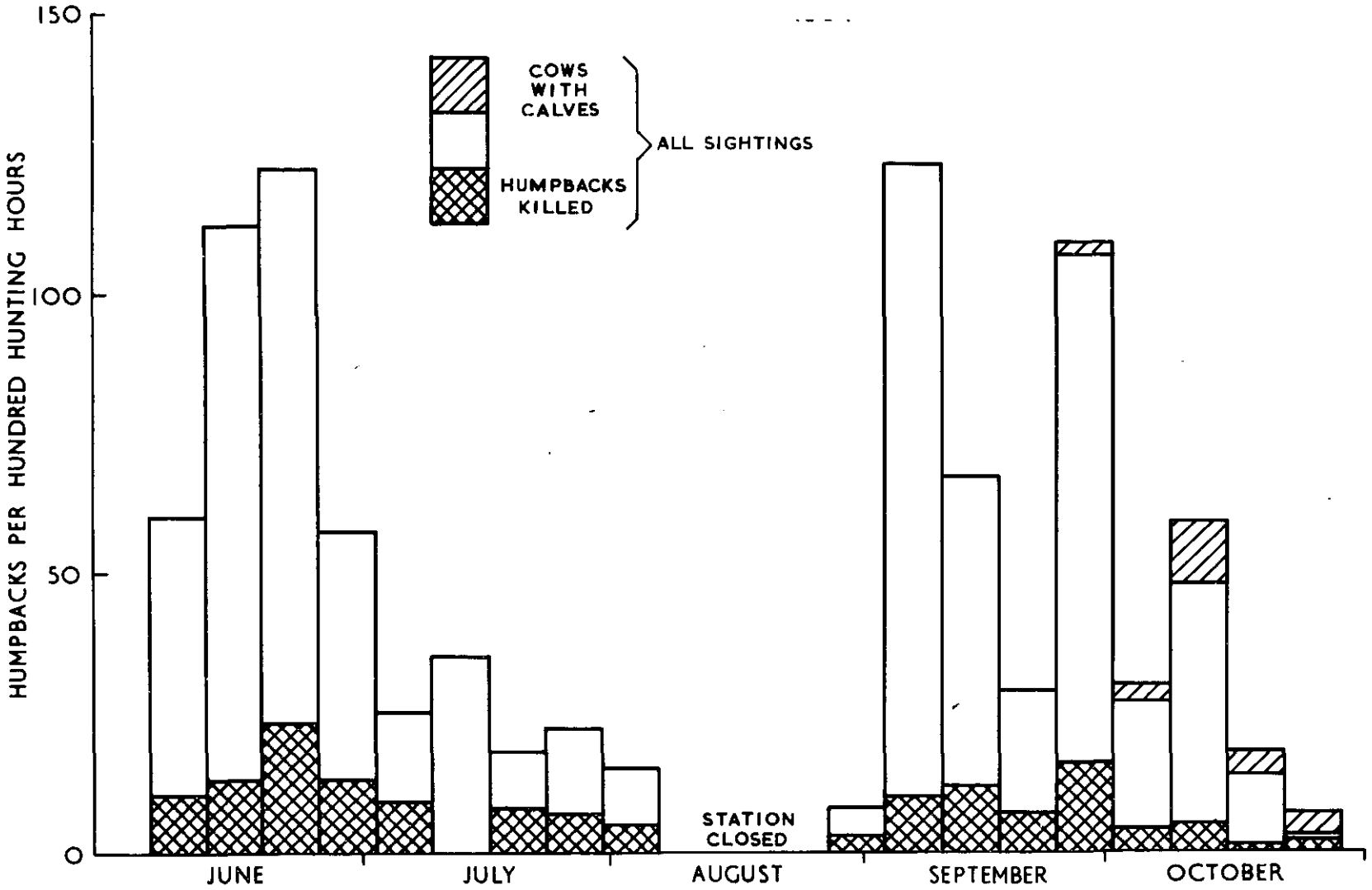


Fig. 6.- Operations by Master/Gunner L. Mills at Byron Bay in 1962. Catcher "Byrond I" June 8 - August 30: catcher "Norfolk Whaler" August 31 - October 27.

TABLE 7

ANNUAL CATCHES OF HUMPBACK WHALES AT CARNARVON STATION SHOWING PERCENTAGES TAKEN OUTSIDE SHARK BAY

| Year | Total catch | Catch outside Shark Bay | |
|---|---|---|---|
| | | No. | % |
| 1951 | 650 | 14 | 2.2 |
| 1952 | 600 | 7 | 1.2 |
| 1953 | 600 | 6 | 1.0 |
| 1954 | 600 | 4 | 0.7 |
| 1955 | 500 | 4 | 0.8 |
| 1956 | 1000 | 25 | 2.5 |
| 1957 | 1018 | 53 | 5.2 |
| 1958 | 885 | 213 | 24.1 |
| 1959 | 541 | 282 | 52.1 |
| 1960 | 440 | 336 | 76.4 |
| 1961 | 475 | 414 | 87.2 |
| 1962 | 503 | 461 | 91.7 |

TABLE 8

SUMMARY OF OPERATIONS BY CATCHERS AT ALBANY, 1961-1962

| | 1961 | | | 1962 | | |
|---|---|---|---|---|---|---|
| | Catcher Kos VII | Catcher Minilya | Both vessels | Catcher Kos VII | Catcher Minilya | Both vessels |
| No. days humpback whaling | 33 | 32 | 65 | 27 | 23 | 50 |
| Total hours steaming | 376¾ | 381¼ | 758 | 310½ | 262¼ | 572¾ |
| Total humpbacks sighted | 165 | 106 | 271 | 65 | 29 | 94 |
| Total humpbacks killed | 58 | 47 | 105 | 24 | 16 | 40 |
| Humpbacks sighted per 100 hrs steaming | 43.8 | 27.8 | 35.8 | 20.9 | 11.1 | 16.4 |
| Humpbacks killed per 100 hrs steaming | 15.4 | 12.3 | 13.9 | 7.7 | 6.1 | 7.0 |
| Humpbacks per catcher day | 1.76 | 1.47 | 1.62 | 0.89 | 0.70 | 0.80 |

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## TABLE 9

## GROUP V POPULATION OF HUMPBACK WHALES

## DISTRIBUTION OF LENGTHS WITHIN CATCHES FROM THE EAST COAST OF AUSTRALIA

## MALES

| Length (ft) | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | | | 1 | | 1 | | | | | | 1 |
| 31 | 1 | 1 | | | | | | | | | 1 |
| 32 | 1 | | 1 | | 1 | | | | | 3 | |
| 33 | 1 | | 1 | 2 | 2 | 2 | | | 2 | 1 | 1 |
| 34 | 1 | 2 | | 1 | | | 1 | | 1 | 2 | |
| 35 | 6 | 9 | 18 | 10 | 7 | 5 | 6 | 6 | 7 | 47 | 15 |
| 36 | 15 | 9 | 13 | 13 | 11 | 14 | 8 | 11 | 12 | 41 | 14 |
| 37 | 20 | 31 | 18 | 21 | 22 | 20 | 18 | 14 | 26 | 46 | 15 |
| 38 | 42 | 50 | 59 | 32 | 25 | 46 | 31 | 42 | 46 | 59 | 10 |
| 39 | 65 | 75 | 75 | 55 | 56 | 57 | 45 | 50 | 63 | 50 | 9 |
| 40 | 77 | 76 | 89 | 92 | 97 | 94 | 76 | 82 | 78 | 51 | 11 |
| 41 | 86 | 94 | 78 | 79 | 82 | 88 | 114 | 96 | 84 | 47 | 10 |
| 42 | 71 | 89 | 78 | 82 | 81 | 96 | 84 | 93 | 66 | 51 | 7 |
| 43 | 40 | 56 | 47 | 66 | 51 | 40 | 75 | 81 | 62 | 25 | 5 |
| 44 | 15 | 14 | 19 | 30 | 27 | 23 | 26 | 43 | 31 | 13 | 1 |
| 45 | 6 | 3 | 11 | 7 | 15 | 3 | 15 | 18 | 9 | 8 | |
| 46 | 1 | | 3 | 3 | 6 | 4 | 12 | 6 | 5 | 3 | |
| 47 | | | | 1 | | | | 1 | 3 | 1 | |
| 48 | | | | | 1 | | | | 1 | | |
| Total No. | 448 | 509 | 511 | 494 | 485 | 492 | 511 | 543 | 496 | 448 | 100 |
| Mean Length (ft) | 40.25 | 40.25 | 40.17 | 40.59 | 40.65 | 40.38 | 40.96 | 41.00 | 40.47 | 39.06 | 38.03 |

TABLE 10

GROUP V POPULATION OF HUMPBACK WHALES

DISTRIBUTION OF LENGTHS WITHIN CATCHES FROM THE EAST COAST OF AUSTRALIA

FEMALES

| Length (ft) | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 29 | | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| 31 | | | | | | 1 | 1 | | | | |
| 32 | 1 | 2 | 3 | | | | | | | 3 | |
| 33 | | 2 | 4 | | 1 | | 1 | 1 | 1 | 2 | 1 |
| 34 | | 1 | | | 1 | 1 | 1 | | 2 | 4 | 6 |
| 35 | 5 | 7 | 9 | 7 | 3 | 7 | 1 | 1 | 4 | 38 | 5 |
| 36 | 5 | 11 | 4 | 3 | 4 | 7 | 3 | 6 | 3 | 21 | 12 |
| 37 | 11 | 7 | 6 | 12 | 15 | 13 | 5 | 11 | 15 | 28 | 6 |
| 38 | 6 | 11 | 20 | 13 | 10 | 17 | 14 | 15 | 11 | 32 | 8 |
| 39 | 15 | 21 | 28 | 21 | 11 | 16 | 12 | 19 | 25 | 33 | 4 |
| 40 | 14 | 11 | 16 | 27 | 22 | 14 | 18 | 15 | 35 | 23 | 11 |
| 41 | 20 | 29 | 31 | 22 | 23 | 29 | 22 | 29 | 38 | 24 | 3 |
| 42 | 22 | 34 | 24 | 27 | 30 | 33 | 30 | 33 | 43 | 25 | 6 |
| 43 | 21 | 32 | 19 | 27 | 42 | 24 | 26 | 36 | 43 | 12 | 4 |
| 44 | 14 | 12 | 17 | 23 | 34 | 27 | 22 | 41 | 27 | 7 | 3 |
| 45 | 10 | 5 | 8 | 22 | 20 | 18 | 26 | 26 | 28 | 18 | 2 |
| 46 | 1 | 1 | 12 | 9 | 9 | 12 | 15 | 18 | 20 | 5 | 1 |
| 47 | 4 | 3 | 5 | 9 | 8 | 4 | 7 | 13 | 12 | 3 | 1 |
| 48 | | | 1 | 3 | 2 | 4 | 4 | 2 | 3 | 4 | |
| 49 | | 1 | | | | 1 | 1 | | 2 | 1 | |
| 50 | | 1 | | | | 1 | | 1 | 2 | | |
| 51 | | | | 1 | | | | | | | |
| 52 | 1 | | | | | | | | | | |
| Total No. | 150 | 191 | 207 | 226 | 235 | 229 | 209 | 267 | 314 | 283 | 73 |
| Mean Length (ft) | 41.06 | 40.66 | 40.74 | 41.66 | 41.85 | 41.47 | 42.15 | 42.22 | 41.88 | 39.22 | 38.64 |

TABLE 11

IMMATURE WHALES IN SAMPLES OF CATCHES FROM THE EAST COAST OF AUSTRALIA

| Year | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|
| | Total catch | Number Examined | Testes weight < 4 kg | | Total catch | Number Examined | Immature and Puberal | |
| | | | No. | % | | | No. | % |
| 1952 | 448 | 233 | 32 | 13.7 | 150 | 102 | 24 | 23.5 |
| 1953 | 509 | 200 | 25 | 12.5 | 191 | 120 | 37 | 30.8 |
| 1954 | 511 | 298 | 36 | 12.1 | 207 | 148 | 49 | 33.1 |
| 1955 | 494 | - | - | - | 226 | 114 | 24 | 21.1 |
| 1956 | 485 | 60 | 2 | 3.3 | 235 | 139 | 25 | 18.0 |
| 1957 | 492 | 215 | 13 | 6.1 | 229 | 183 | 49 | 26.8 |
| 1958 | 511 | 205 | 17 | 8.3 | 209 | 121 | 29 | 24.0 |
| 1959 | 543 | 273 | 8 | 2.9 | 267 | 205 | 46 | 22.4 |
| 1960 | 496 | 293 | 22 | 7.5 | 314 | 212 | 44 | 20.8 |
| 1961 | 448 | 446 | 151 | 33.9 | 283 | 263 | 143 | 54.4 |
| 1962 | 100 | 100 | 44 | 44.0 | 73 | 73 | 39 | 53.4 |

TABLE 12

ESTIMATED DISTRIBUTION OF AGE IN ANNUAL CATCHES OF MALE HUMPBACKS

EAST COAST OF AUSTRALIA 1952-62

| Age (yrs) | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 2 | 1 | 1 | | 2 | 2 | | | | 5 | 5 |
| 3 | 16 | 18 | 23 | 19 | 15 | 14 | 12 | 3 | 26 | 67 | 28 |
| 4 | 28 | 31 | 31 | 25 | 23 | 28 | 20 | 18 | 13 | 72 | 10 |
| 5 | 45 | 51 | 53 | 41 | 40 | 43 | 38 | 52 | 41 | 44 | 21 |
| 6 | 56 | 63 | 65 | 55 | 55 | 57 | 52 | 58 | 69 | 46 | 10 |
| 7 | 42 | 48 | 47 | 42 | 42 | 27 | 42 | 43 | 41 | 47 | 1 |
| 8 | 35 | 39 | 38 | 36 | 37 | 32 | 39 | 37 | 44 | 28 | 5 |
| 9 | 34 | 38 | 36 | 36 | 36 | 22 | 40 | 35 | 45 | 32 | 5 |
| 10 | 24 | 27 | 27 | 29 | 28 | 27 | 30 | 39 | 30 | 7 | 3 |
| 11 | 21 | 25 | 24 | 25 | 24 | 30 | 27 | 43 | 17 | 6 | 2 |
| 12 | 21 | 25 | 24 | 25 | 24 | 17 | 27 | 24 | 24 | 21 | 3 |
| 13 | 20 | 24 | 23 | 26 | 25 | 30 | 27 | 30 | 30 | 10 | |
| 14 | 10 | 11 | 12 | 13 | 13 | 16 | 14 | 6 | 16 | 6 | |
| 15 | 11 | 12 | 12 | 12 | 12 | 17 | 14 | 23 | 10 | 6 | 2 |
| 16 | 12 | 14 | 14 | 16 | 15 | 17 | 18 | 23 | 16 | 5 | 1 |
| 17 | 11 | 13 | 13 | 15 | 15 | 9 | 17 | 21 | 13 | 8 | 1 |
| 18 | 8 | 10 | 9 | 11 | 10 | 13 | 14 | 10 | 4 | 8 | 1 |
| 19 | 7 | 8 | 8 | 9 | 9 | 4 | 12 | 16 | 14 | 1 | |
| 20 | 5 | 6 | 5 | 6 | 5 | 7 | 6 | 7 | 8 | 3 | |
| 20+ | 40 | 45 | 46 | 53 | 54 | 80 | 62 | 55 | 35 | 26 | 2 |
| Total catch | 448 | 509 | 511 | 494 | 485 | 492 | 511 | 543 | 496 | 448 | 100 |

Using separate EP. Age/length keys of individual samples in each of 1957, 1959 1960, 1961, and 1962. For 1958, and period 1952-1956, using the combined Age/length key of all east coast male samples 1957-61.

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TABLE 13

ESTIMATED DISTRIBUTION OF AGE IN ANNUAL CATCHES OF FEMALE HUMPBACKS

EAST COAST OF AUSTRALIA 1952-62

| Age (yrs) | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 5 |
| 3 | 13 | 18 | 21 | 17 | 15 | 18 | 12 | 15 | 20 | 45 | 18 |
| 4 | 14 | 20 | 22 | 19 | 17 | 20 | 13 | 17 | 22 | 50 | 12 |
| 5 | 14 | 19 | 22 | 18 | 16 | 20 | 13 | 17 | 21 | 49 | 11 |
| 6 | 15 | 20 | 23 | 22 | 20 | 21 | 18 | 22 | 30 | 27 | 10 |
| 7 | 12 | 16 | 16 | 17 | 16 | 16 | 15 | 17 | 24 | 17 | 4 |
| 8 | 13 | 17 | 17 | 18 | 19 | 19 | 17 | 21 | 27 | 17 | 2 |
| 9 | 10 | 12 | 11 | 14 | 16 | 14 | 13 | 17 | 20 | 11 | 1 |
| 10 | 8 | 10 | 10 | 12 | 15 | 12 | 12 | 16 | 17 | 8 | 2 |
| 11 | 8 | 10 | 9 | 12 | 14 | 12 | 13 | 16 | 18 | 9 | 2 |
| 12 | 7 | 8 | 8 | 11 | 13 | 11 | 11 | 15 | 16 | 7 | 2 |
| 13 | 5 | 6 | 6 | 8 | 10 | 8 | 9 | 11 | 12 | 6 | 1 |
| 14 | 5 | 6 | 5 | 7 | 9 | 7 | 7 | 10 | 10 | 4 | |
| 15 | 3 | 3 | 4 | 5 | 6 | 5 | 6 | 7 | 8 | 4 | |
| 16 | 6 | 7 | 7 | 10 | 12 | 10 | 11 | 14 | 15 | 7 | |
| 17 | 2 | 2 | 4 | 5 | 5 | 5 | 5 | 7 | 7 | 3 | |
| 18 | 2 | 2 | 2 | 3 | 4 | 3 | 4 | 5 | 5 | 2 | |
| 19 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 4 | 3 | 1 | 1 |
| 20 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 1 | |
| 20+ | 11 | 12 | 15 | 23 | 23 | 22 | 24 | 32 | 34 | 13 | 2 |
| Total catch | 150 | 191 | 207 | 226 | 235 | 229 | 209 | 267 | 314 | 283 | 73 |

Using ovary/length keys applied to length frequency distribution of catches. Ovulation group "O" distributed on ear plug data.

TABLE 14

OPERATIONS OF CATCHERS ON HUMPBACK WHALES AT TANGALOOMA IN 1962

(All during north bound migration)

| 7 days ending | No. days whaling | Total hours steaming | Total hours hunting | Total humpbacks sighted | No. humpbacks killed | Sightings per 100 hours hunting | Catch per 100 hours hunting |
|---|---|---|---|---|---|---|---|
| CATCHER LOOMA II | | | | | | | |
| June 18 | 1 | 11 | 10½ | No record | 0 | - | 0 |
| 25 | 7 | 79 | 73¾ | 59 | 9 | 80.0 | 12.2 |
| July 2 | 6 | 65 | 61¾ | 48 | 7 | 79.4 | 11.3 |
| 9 | 7 | 76¾ | 70¼ | 32 | 4 | 45.6 | 5.7 |
| 16 | 6 | 71½ | 56¼ | 3 | 1 | 3.3 | 1.8 |
| 23 | 7 | 100¼ | 74½ | 29 | 9 | 38.9 | 12.1 |
| 30 | 7 | 89½ | 75¾ | 19 | 5 | 25.1 | 6.6 |
| Aug. 6 | 6 | 83½ | 66 | 13 | 3 | 19.7 | 4.5 |
| Total | 47 | 576½ | 488¾ | 204 | 38 | 41.7 | 7.77 |
| CATCHER LOOMA III | | | | | | | |
| June 18 | 1 | 11¼ | 10¾ | No record | 0 | - | 0 |
| 25 | 3 | 82¼ | 75¼ | 70 | 7 | 93.0 | 9.3 |
| July 2 | 6 | 73 | 60¾ | 42 | 5 | 69.1 | 8.2 |
| 9 | 7 | 80½ | 75 | 15 | 0 | 20.0 | 0 |
| 16 | 6 | 75¼ | 63¼ | 16 | 3 | 25.3 | 4.7 |
| 23 | 7 | 98¾ | 75¼ | 23 | 12 | 30.6 | 15.9 |
| 30 | 7 | 84¾ | 74¾ | 9 | 1 | 12.0 | 1.3 |
| Aug. 6 | 6 | 76 | 65 | 3 | 2 | 4.6 | 3.1 |
| Total | 47 | 581¾ | 500 | 178 | 30 | 35.6 | 6.00 |
| TOTAL BY BOTH CATCHERS | | | | | | | |
| | 94 | 1,158¼ | 988¾ | 382 | 68 | 38.6 | 6.88 |

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## TABLE 15

## OPERATIONS OF MASTER/GUNNER L. MILLS AT BYRON BAY, 1962

(Catcher "Byrond I" June 8 - Aug. 30: Catcher "Norfolk Whaler" Aug. 31 - Oct. 27)

| 7 days ending | No. days whaling | Total hours steaming | Total hours hunting | Total humpbacks sighted | No. cows with young calves sighted | No. humpbacks killed | Humpbacks sighted per 100 hrs hunting | Humpbacks killed per 100 hrs hunting |
|---|---|---|---|---|---|---|---|---|
| June 11 | 4 | 39½ | 30¼ | 18 | | 3 | 60 | 10 |
| 18 | 6 | 65 | 47½ | 58 | | 6 | 112 | 13 |
| 25 | 7 | 84 | 59¾ | 73 | | 14 | 122 | 23 |
| July 2 | 5 | 59¾ | 47½ | 27 | | 6 | 57 | 13 |
| 9 | 6 | 66¼ | 55¼ | 14 | | 5 | 25 | 9 |
| 16 | 1 | 11¾ | 11½ | 4 | | 0 | 35 | 0 |
| 23 | 7 | 93¼ | 72 | 13 | | 6 | 18 | 8 |
| 30 | 7 | 82¼ | 72½ | 16 | | 5 | 22 | 7 |
| Aug. 6 | 6 | 71¼ | 59¼ | 9 | | 3 | 15 | 5 |
| 13 | Station closed | | | | | | | |
| 20 | " | " | | | | | | |
| 27 | 1 | 4¼ | 3¾ | 2 | | 0 | | |
| Sept. 3 | 7 | 86½ | 76¾ | 6 | | 2 | 8 | 3 |
| 10 | 7 | 82½ | 69¼ | 85 | | 7 | 123 | 10 |
| 17 | 7 | 82½ | 67½ | 45 | | 8 | 67 | 12 |
| 24 | 7 | 87¾ | 76½ | 22 | | 5 | 29 | 7 |
| Oct. 1 | 7 | 86½ | 64½ | 70 | 1 | 10 | 109 | 16 |
| 8 | 7 | 83¾ | 76 | 23 | 2 | 3 | 30 | 4 |
| 15 | 7 | 87 | 74½ | 44 | 8 | 4 | 59 | 5 |
| 22 | 7 | 83¼ | 78 | 14 | 3 | 1 | 18 | 1 |
| 29 | 5 | 59 | 56½ | 4 | 2 | 1 | 7 | 2 |
| Total | 111 | 1,316 | 1,098¾ | 542 | 16 | 89 | 49.3 | 8.1 |

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