

CHAPTER XXV

MARINE INDUSTRIES

NOTE.—Further information on subjects dealt with in this chapter is contained in the annual printed bulletin *Non-Rural Primary Industries and Value of Production* and in the annual mimeographed statistical bulletin *Fishing and Whaling*, particularly as regards types of fish, etc., caught.

§ 1. Introduction

1. **Marine Resources and their Commercial Exploitation.**—(i) *Fish.* It has been calculated that there are approximately 2,000 species of fish in Australia and the waters surrounding it (including freshwater species). Fishing is carried out continually in estuarine, coastal and off-shore Australian waters in the east and south from Port Douglas in Queensland to Ceduna in South Australia, and in Western Australia from Esperance to Shark Bay, and sporadically in the Onslow, Broome, Darwin and Karumba areas in the north. Most fishing is done in waters over the continental shelf, which varies greatly in width around the continent, but tuna is sometimes fished beyond the shelf. As in other countries, fisheries in Australia may be divided into three types: the estuarine fisheries, located in the tidal waters of rivers and coastal lakes; the pelagic fisheries which exploit species inhabiting the surface layers of the open ocean; and the demersal fisheries, which fish the bottom layers of the sea. The estuarine fisheries produce considerable quantities of the table varieties, such as mullets (*Mugil cephalus* and associated species), and breams (*Acanthopagrus spp.*). In addition to these there is a small freshwater commercial fishery, principally in New South Wales and South Australia, exploiting Murray cod (*Maccullochella macquariensis*) and golden perch (*Plectroplites ambiguus*). The pelagic fisheries produce species exploited during their seasonal migration, such as Australian "Salmon" (*Arripis trutta*), which is a member of the order Perciformes, or perch-like fishes, tunas (*Fam. Thynnidae, Katsuwonidae, Sardidae*), barracouta (*Leionura atun*) and mackerels (*Cybium spp.*). These fisheries, with the exception of some tuna, mackerel and reef fisheries, are concentrated in the temperate waters around the southern half of the continent. The offshore demersal fisheries include those pursued on the reefs which may be found virtually right around the continent, and which yield such species as snapper (*Chrysophrys auratus*), the so-called "cods" (*Epinephelus, Choerodon, Callyodon spp.*), and associated species; those pursued on the trawling grounds, which produce species such as flathead (*Neoplatycephalus, Trudis spp.*), morwong (*Nemadactylus spp.*), John Dory (*Zeus faber*), etc.; and the important fishery for edible shark (school shark, *Galeorhinus australis*, and gummy shark, *Mustelus antarcticus*), in south-eastern Australia.

(ii) *Crustaceans.* Crustaceans taken in Australia include crayfish, prawns, crabs and freshwater lobsters. Crayfish (southern, *Jasus lalandei*; western, *Panulirus cygnus*; and eastern, *Jasus verreauxi*) is the most important crustacean exploited in Australia, and various species occur on the reefs of the continental shelf in all States. The commercial fishery, for technological reasons and through lack of knowledge of numbers, has not extended to the

tropical species (*P. ornatus*, etc.), but is concentrated on species found around the southern part of Australia. Prawns (*Penaeus* and *Metapenaeus spp.*) are taken in the estuarine, coastal and offshore waters of New South Wales and Queensland, and in the Shark Bay and Exmouth Gulf region of Western Australia. Crabs (*Scylla* and *Portunus spp.*) are taken mainly in Queensland and Western Australia, but small quantities are also taken in the other States. Freshwater lobsters (*Euastacus serratus*) are caught in inland streams in New South Wales, and one species, marron (*Cheraps tenuimanus*) forms the basis of an amateur fishery in the south-west of Western Australia.

(iii) *Molluscs*. Edible molluscs produced in Australia include oysters (mainly *Crassostrea commercialis*), scallops, mussels and some of the cephalopods (squid, octopus, cuttlefish). Naturally-grown oysters are produced in all States except South Australia. In New South Wales and, to a lesser extent, in Queensland, edible oysters are cultured commercially. The scallops (*Pecten meridionalis* and *Equichlamys bifrons*) are taken in Tasmania, the saucer scallop (*Amusium balloti*) is harvested in Queensland, and a fishery exploiting the species *Pecten alba* has recently been developed in Port Phillip Bay. The scallop resources in the Shark Bay area of Western Australia have not been developed, and are still the subject of scientific investigations. Mussels (*Mytilis planulatus*) are gathered mainly in Victoria. Small quantities of cephalopods, mainly squid (*Loligo spp.*), are produced in many localities. Increased interest in the abalone (*Haliotis spp.*) has resulted in the development of small fisheries off southern New South Wales and Victoria and the east coast of Tasmania. Other edible molluscs taken from time to time include pipis (*Plebidonax deltoides*).

(iv) *Pearl-shell and Trochus-shell*. The shell of the Australian species of pearl oyster (*Pinctada maxima*) is taken in the tropical waters of Australia from Exmouth Gulf in Western Australia to Cairns in Queensland for the manufacture of buttons, knife handles, etc. Live pearl-shell is used for pearl culture, the *Pinctada maxima* being capable of producing pearls which are the largest in the world and which command top market prices. Trochus-shell is found mainly on coral reefs off the Queensland coast, although small quantities occur in Western Australia.

(v) *Whales*. The Australian whaling industry formerly exploited the humpback whales (*Megaptera nodosa*) during their winter migrations along the east and west coasts of Australia. However, owing to the total prohibition placed on their capture by the International Whaling Commission in 1963, Australian whaling is now confined to the sperm whale (*Physeter catoden*) which has been taken in the southern waters of Western Australia since 1955.

(vi) *Marine Flora*. Seaweeds of possible commercial value occur in the coastal waters of New South Wales, Tasmania and Western Australia. In 1964, at Louisville, Tasmania, a factory began processing seaweed (*Macrocystis pyrifera*) for its alginic content.

2. History of the Development of Marine Industries in Australia.—(i) *Fishing*. At the beginning of this century Australian fisheries were principally estuarine and onshore, and the deeper offshore resources were comparatively unknown. Vessels were generally sail-powered, and catching and preservation methods were primitive.

From 1909 to 1914 a Commonwealth vessel was engaged in research into fisheries resources around Australia. As a result of this exploration, trawling in the south-eastern waters began in 1915. There have been several years of high production from this fishery, but in each case the peak year was followed by a period of low production. Danish seine trawlers entered this fishery in 1936. In 1958–59 steam trawling vessels used in this area were taken out of service and a modern diesel trawler was introduced. This fishery is now stabilized at a relatively low level of production.

The tuna fishery began with the establishment in 1937 of a cannery at Narooma in New South Wales to exploit the occurrences, mainly of southern bluefin tuna (*Thunnus thynnus maccoyii*), which had been revealed by aerial surveys in 1936. However, landings were insignificant for over a decade. In 1950 the Commonwealth Government sponsored the visit of a Fijian tuna clipper and trained crew to instruct fishermen in the pole-and-live-bait method of catching tuna. Development of the South Australian tuna fishery followed the visit of two American tuna experts in 1954. Recent developments in tuna fishing include the use of gill netting and long-lining. Techniques for taking species of tuna other than southern bluefin are being investigated.

(ii) *Crustaceans*. The crayfishery, which is pursued off south-eastern Australia and off the west coast of Western Australia, was for many decades on a small scale. It was not until 1944 that the major sector, the western crayfishery, began to develop into what is now Australia's most productive single fishery. Between 1944 and 1947, production from the shallow areas of Houtman Abrolhos was used for canning for the armed forces. From 1948 to 1953 mechanization of the fleet was introduced progressively and deeper waters were worked. The United States market for frozen craytails was established during this period. The period 1954 to 1962 saw the introduction of larger and more powerful vessels, of conservation measures designed to maximize the sustainable yield, and of increased processing facilities. In the southern crayfishery development has followed similar lines, but on a smaller scale because of the smaller crayfish population.

The prawn fishery was pursued for many decades on a small scale, but it was not until the discovery of the need for prawns to spawn at sea that interest developed in catching them during this phase of their life cycle. The discovery in 1947 of stocks of prawns in Stockton Bight and off Evans Head (both in New South Wales) initiated the development of deep-sea prawning in Australia. Since that time the prawn fishery has expanded to the offshore grounds. Commercial prawn fisheries in Western Australia commenced at Shark Bay in 1962 and at Exmouth Gulf in 1964.

(iii) *Molluscs*. Natural oyster-beds were being harvested soon after settlement first began, but by 1870 rapid depletion of the stocks had resulted in restrictive legislation being passed in New South Wales. By the end of the nineteenth century, however, farms had been established in New South Wales and oyster cultivation was a notable industry. This cultivation has been almost entirely confined to the river estuaries of New South Wales. Very few oysters are exported and importation of oysters is necessary to cope with home demand. During 1964 a commercial scallop fishery was established in Port Phillip Bay and there was a noticeable development in the harvesting of abalone in the waters of New South Wales, Tasmania and Victoria.

(iv) *Whaling*. Whaling has been undertaken from time to time in Australia since the early days of settlement. Humpback whaling was carried out from stations on the west coast of Australia from 1949, and on the east coast from 1952. However, depleted stocks of the species resulted in the closing down by 1962 of the eastern stations, and in 1963, owing to the severe decline in world stocks of humpback whales, the International Whaling Commission, of which Australia is a member, prohibited the capture of the species south of the equator for an indefinite period. Australian whaling is now carried out from Albany only, and is confined to sperm whales for which there is no overall catch quota.

(v) *Pearling*. Since the middle of the nineteenth century, when pearling by Europeans first commenced in Australia, the collection of natural pearls has been incidental to the production of mother-of-pearl shell. Although attempts to establish pearl culture in Australia had been partially successful as early as the end of the last century, it was not until

1956 that the modern technique, as developed by the Japanese, was introduced into Australia at Kuri Bay in Western Australia. The joint venture between Australian and Japanese interests proved successful and others entered the industry. There are now fifteen pearl culture farms in Western Australia, the Northern Territory and Queensland. Twelve of the farms are operated as joint ventures by Australian and Japanese interests, while three are wholly Australian enterprises. The technique of pearl culture is still a closely-guarded trade secret.

A map showing Australia's principal ports and the localities of the fishery resources under exploitation appears on page 1121 of this Year Book.

§ 2. Administration and Research

1. Government Administration.—The fisheries within territorial waters (that is, within three miles of the shore) are administered by State departments and Territory administrations. The Fisheries Branch of the Department of Primary Industry develops and administers fisheries in extra-territorial waters and co-ordinates fisheries administration.

The fisheries legislation of each State and Territory and of the Commonwealth provides for the licensing of boats used in commercial fishing operations and of commercial fishermen. The provisions are broadly similar in each State, the general requirement being that any person who takes fish for sale, and any boat used in such fishing operations, must be licensed in the State or Territory concerned. Some States extend the licensing requirements to amateur or part-time fishermen. Australian nationals who fish commercially outside the territorial waters of a State or Territory, but within Australian waters as proclaimed under the *Fisheries Act 1952-1959*, are required to take out licences and to register their boats under that Act.

Fish stocks inhabiting Australian waters are a common property resource. With the exception of the Western Australian crayfishery and the Shark Bay prawn fishery, there are no restrictions on recruitment of men and vessels to any fishery. It has, therefore, been necessary for governmental action to be taken in an endeavour to provide rules of operation in certain fisheries which are vulnerable to depletion. The policy basic to the management of these fisheries is the greatest sustainable yield consistent with economic operations. Where a fishery, for economic reasons, is not producing its maximum yield, efforts to discover new methods of utilization of the catch are made.

The *Pearl Fisheries Act 1952-1953* aims at the management of the pearl-shell resources in accordance with Australia's proclamation of sovereign rights over the natural resources of the sea bed and subsoil to the 100 fathom line. It requires that all pearlers, vessels, etc., must be licensed, and prohibits the removal of live shell from Australian waters except with the written permission of the Minister for Primary Industry.

Under the *Whaling Act 1960* the Commonwealth controls whaling from Australian stations in accordance with the conditions laid down by the International Whaling Commission. This Commission was established by the International Convention for the Regulation of Whaling, 1946, to organize world-wide conservation measures.

2. Research.—The aim of all fisheries research in Australia is to achieve the greatest sustainable yield of fish and to assist in the development of an efficient industry. To this end much of the biological research already undertaken has been directed at formulating recommendations for management measures in various fisheries. Research work is also carried out which is expected to lead to the development of new fisheries, the expansion of under-exploited fisheries, more economical operations, and the use of more efficient equipment.

The organizations in Australia at present engaged in research into fisheries matters are:—

- (i) Division of Fisheries and Oceanography, C.S.I.R.O. (biological and oceanographic research);
- (ii) Division of Food Preservation, C.S.I.R.O. (research into handling, storage, processing and transport of fish);
- (iii) the several State fisheries departments (general biological research);
- (iv) Fisheries Branch, Department of Primary Industry (economic and management research, gear technology, extension work to the industry).

§ 3. Collection and Presentation of Statistics

1. **Source and Basis of Statistics.**—Statistics presented in this chapter have been collected by a number of authorities. The various State fisheries authorities have supplied, through the Deputy Commonwealth Statisticians in the States, the details of employment, boats, equipment, and production of the general fisheries and the pearl and shell fisheries. The Fisheries Branch of the Department of Primary Industry has supplied particulars of the whaling industry. Statistics of the processing of general fisheries products and of oversea trade in the products of fishing and whaling have been compiled in the Commonwealth Bureau of Census and Statistics.

The statistics refer, in general, to financial years. However, pearl and shell fishing data refer to the season ended in the financial year shown. Whaling statistics are shown by calendar years, and refer to the season in the calendar year. All oversea trade information refers to financial years.

In the preparation of Australian fisheries production statistics the quantities of individual products are generally in terms of the form in which they are taken from the water. For example, the statistics of fish production published in this chapter are in terms of "estimated live weights" which are calculated from landed weights by using conversion factors for each species in each State. These conversion factors allow for the fact that the quantities of fish reported are frequently in a gutted, headed and gutted, or otherwise reduced condition. Crustaceans are reported on a "whole weight" basis, and molluscs (edible) on a "gross (in-shell) weight basis". The figures of pearl-shell and trochus-shell refer to the actual quantities of dry shell for sale and exclude the weight of the fish.

In Australia the basic source of statistical information on commercial fishing operations is the fishermen. In four of the six States monthly returns of catch by species have been obtained from fishermen for a number of years. In the other two States (Queensland and South Australia) there have been no statistical collections from fishermen, and catch statistics have been derived from other sources such as markets and receiving depots. In general it is recognized that catch statistics in Australia have been somewhat incomplete in past years. For example, details of production given in this chapter refer in most cases only to the recorded commercial production. In view of the importance of amateur fishermen in certain types of fishing, details shown cannot be taken as representing the total catch. In addition, it is likely that the figures shown understate to some extent the full commercial catch, because no information is available on fish taken for sale by persons not licensed as professional fishermen.

Two weaknesses of fisheries statistical collections in Australia to date have been the lack of uniformity, which makes it difficult to compile statistics on an Australia-wide basis, and the lack of data on the effort involved in taking fish (time spent fishing, gear used, etc.). Recognizing these weaknesses, the Commonwealth-State Fisheries Conference in 1960 appointed a Statistics Committee "to examine all aspects of fisheries statistics and fully document a proposed system for submission to the States and Commonwealth for approval".

2. **Model System of Catch and Effort Statistics, 1962.**—The model system of catch and effort statistics designed by the Committee was adopted by the Commonwealth-States Fisheries Conference in 1962. The new system was introduced in Tasmania in 1963, and in Victoria and Western Australia in 1964. The system was introduced in Queensland for the otter trawl fishery early in 1965, but there are no definite plans at present to extend the system to other fisheries. Arrangements are proceeding for the introduction of the model system in New South Wales, but there are no plans as yet for the introduction of the system in South Australia.

Under the new system fishermen are asked to report, on a monthly basis, for the various fishing methods used, catch of each species taken and the locality where the greatest proportion of the catch is taken. Fishermen are asked to record catch in terms of landed weight, and appropriate conversion factors are used to obtain live weight where this is required. A grid system of 1° rectangles (relating to latitude and longitude) is used for recording location of catches at sea, and estuaries and inland waters are recorded where appropriate. Other data obtained include details of fishing effort, ports at which catch is landed, and employment details.

The eventual implementation of this system in all States is expected to ensure the availability of statistical information of a much higher standard in the future. In addition to the new system of catch and effort statistics, a uniform boat registration system is now being introduced by the States. This new system will eventually ensure that details of various characteristics of the commercial fishing fleet are available on a uniform basis for all States.

§ 4. Employment in Marine Industries

1. **Census Data.**—In the following table, which shows particulars collected in the Population Censuses of Australia at 30th June, 1947, 1954 and 1961, the numbers of persons whose industry statements were classified to "fishing" are shown together with the numbers engaged in all primary industries and the total work force. The Census classification "fishing" is equivalent to the general term "marine industries" and includes such activities as fishing, whaling, pearl-shell fishing, etc.

PERSONS ENGAGED IN FISHING: AUSTRALIA

Particulars	Census, 30th June—		
	1947	1954	1961
Persons engaged in—			
Fishing	10,656	8,637	8,252
All primary industries	563,607	560,100	513,286
Total work force	3,196,431	3,702,022	4,225,096
Persons engaged in fishing as a proportion of—			
All primary industries %	1.9	1.5	1.6
Total work force %	0.3	0.2	0.2

NOTE.—An adjustment was made to the 1947 and 1954 industry data by distributing over the range of recorded industry the number of persons whose industry was not stated. No such adjustment was made to the 1961 figures.

2. **Annual Employment by Industry.**—The following two tables show details of persons engaged in the taking of fish, crustaceans and edible molluscs, pearl-shell and trochus-shell, and in whaling. These statistics are derived mainly from the licensing records of the various State fisheries authorities. Because the definitions and licensing procedures used by these authorities are not uniform the statistics should not be used to compare the relative productivities of marine industries in the several States. Figures for employment in general fisheries in 1962–63 and 1963–64 are not comparable with those for previous years because licensed part-time (non-commercial) fishermen were included in the total for South Australia prior to 1962–63. In 1962–63 and 1963–64 an estimate for full-time (commercial) fisherman engaged has been included. Persons engaged in more than one industry are classified according to their main activity, and so may be classified differently from one year to the next.

The table below gives details by States for 1963–64 of employment in marine industries.

MARINE INDUSTRIES: EMPLOYMENT, 1963–64

(Persons engaged)

Industry	N.S.W.	Vic.	Qld	S.A.	W.A.(a)	Tas.	N.T.	Aust.
General fisheries ..	2,439	1,541	2,111	(b)2,000	2,526	1,191	54	11,862
Edible oyster fisheries ..	1,354	..	106	n.a.	7	..	..	1,467
Pearl-shell and trochus-shell ..	..	..	497	..	120	..	23	640
Whaling(c)—At sea ..	..	..	..	..	85	..	..	85
Whaling—Ashore ..	..	..	..	..	90	..	..	90

(a) Figures are for the year ended December, 1963. (b) In addition, approximately 6,520 (non-commercial) licensed fishermen operated on a part-time basis. (c) Estimated.

The following table shows similar information for Australia for the years 1959-60 to 1963-64.

MARINE INDUSTRIES: EMPLOYMENT, AUSTRALIA

(Persons engaged)

Industry	1959-60	1960-61	1961-62	1962-63	1963-64
General fisheries	13,319	14,955	15,878	(a) 11,544	(a) 11,862
Edible oyster fisheries	917	822	993	1,154	1,467
Pearl-shell and trochus-shell	1,120	995	724	727	640
Whaling—At sea	151	139	161	123	85
Whaling—Ashore	444	421	240	164	90

(a) Not comparable with previous years; see text p. 1114.

§ 5. Boats and Equipment in Marine Industries

1. **Fish, Crustaceans and Molluscs (edible).**—The boats used for the estuarine fisheries are mostly small vessels, propelled by diesel or petrol engines of low power. The offshore vessels range in length from 30 feet to 120 feet and are almost invariably powered by diesel engines. Many of them have insulated holds to carry fish in ice, and some of the crayfish boats are fitted with wells in which the catch is kept alive. Some vessels have dry refrigeration, and others, including some of the tuna live-bait pole-fishing vessels, are equipped with brine refrigeration.

A recent survey showed that about 50 per cent. of Australia's commercial fishing fleet consists of vessels up to 20 feet in length, about 25 per cent. are in the 20-29 feet category, and the remainder are greater in length. Only a very small percentage is greater than 50 feet in length. It is hoped that more precise information on this aspect of the fishing fleet will be available in the future when an improved boat registration system is adopted in all States.

Almost every type of fishing equipment is used. The following table sets out the equipment most commonly used for the main types of fish, crustaceans and molluscs.

FISHING EQUIPMENT USED IN AUSTRALIA

Type of fish	Equipment used
Mullet	Beach seine, gill net
Shark (edible)	Long-lines, gill net
Australian salmon	Beach seine
Barracouta	Trolling lines
Flathead	Danish seine, otter trawl
Snapper	Long-lines, traps
Morwong	Danish seine, otter trawl, traps
Whiting	Handlines, Danish seine
Garfish	Gill net, beach seine
Mackerel	Trolling lines
Tuna(a)	Pole and live-bait, trolling lines, gill netting
Prawns	Otter trawl, beam trawl, seine net
Crayfish	Pots, traps
Scallops	Dredge, otter trawl

(a) Lampara nets and purse seines are used for taking live bait for tuna.

2. Pearls, Pearl-shell and Trochus-shell.—Ketch-rigged luggers about 55 feet long which carry crews of 8 to 14 members are used for pearl and pearl-shell fishing around Australia.

3. Whaling.—The whaling industry is highly mechanized. Standard equipment includes aircraft to locate whales, steam- and diesel-powered catchers of about 100 to 125 feet in length, and tow boats.

4. Boats and Equipment Employed by Industry.—The following two tables show details of boats and equipment employed in the taking of fish, crustaceans and edible molluscs, pearl-shell and trochus-shell, and the number of chasers and stations engaged in whaling operations. The reservations mentioned in § 4., paragraph 2, page 1114, regarding the use of employment information are also applicable to these tables. Boats employed in more than one industry are classified to their main activity.

The table below gives details by States for 1963–64.

MARINE INDUSTRIES: BOATS AND EQUIPMENT EMPLOYED AND WHALING STATIONS OPERATING, 1963-64

Particulars		N.S.W.	Vic.	Qld.	S.A.	W.A.(a)	Tas.	N.T.	Aust.
General fisheries—									
Boats employed	No.	2,463	917	1,464	1,636	1,456	507	30	8,473
Value of boats and equipment	£'000	3,015	2,294	1,977	2,602	4,890	1,079	40	15,897
Edible oyster fisheries—									
Boats employed	No.	1,366	..	55	n.a.	3	..	..	1,424
Value of boats and equipment	£'000	468	..	19	n.a.	1	..	..	488
Pearl-shell and trochus-shell—									
Boats employed	No.	..	..	38	..	13	..	2	53
Value of boats and equipment	£'000	..	..	155	..	67	..	18	240
Whaling—									
Chasers	No.	..	..	..	..	8	..	..	8
Stations operating	No.	..	..	..	..	2	..	..	2

(a) Year ended December, 1963.

The following table shows similar information for Australia for the years 1959–60 to 1963–64.

MARINE INDUSTRIES: BOATS AND EQUIPMENT EMPLOYED AND WHALING STATIONS OPERATING, AUSTRALIA

Particulars		1959–60	1960–61	1961–62	1962–63	1963–64
General fisheries—						
Boats employed	No.	7,890	7,756	8,147	8,574	8,473
Value of boats and equipment	£'000	10,762	12,411	12,899	14,149	15,897
Edible oyster fisheries—						
Boats employed	No.	1,213	1,449	1,349	1,294	1,424
Value of boats and equipment	£'000	368	412	484	461	488
Pearl-shell and trochus-shell						
Boats employed	No.	85	85	56	60	53
Value of boats and equipment	£'000	515	467	254	275	240
Whaling—						
Chasers	No.	12	11	12	11	8
Stations operating .. .. .	..	4	4	4	4	2

§ 6. Production, Processing and Domestic Marketing

1. Marine Products.—(i) *Fish.* The following table shows details of the production of the main types of fish caught in each State and the Northern Territory in 1963–64.

FISH: PRODUCTION, BY TYPE, 1963-64
(‘000 lb. estimated live weight)

Type	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
Marine types—								
Tuna	5,689	74	1	12,085	49	29	5	17,932
Mullet	6,029	960	3,611	600	1,276	18	2	12,496
Australian salmon	2,901	1,649	..	1,245	4,615	850	..	11,260
Shark	1,801	(a) 4,738	20	2,397	688	(a) 816	..	10,460
Flathead	3,681	2,213	192	..	22	43	..	6,151
Morwong	4,016	520	..	..	..	4	..	4,540
Barracouta	16	2,906	..	..	..	1,409	..	4,331
Snapper	1,635	335	68	579	1,543	..	..	4,160
Whiting	487	255	553	1,615	588	..	..	3,498
Mackerel	239	..	1,762	..	205	9	..	2,215
Garfish	290	476	152	620	73	129	..	1,740
Tailor	427	99	938	..	163	..	..	1,627
Luderick	1,056	58	179	..	..	..	..	1,293
Bream (incl. Tarwhine)	461	218	420	54	79	1	..	1,233
Leatherjacket	1,066	33	..	..	26	..	..	1,125
Ruff .. .. .	..	89	..	475	529	..	..	1,093
Other	4,110	1,924	1,788	1,066	1,638	122	259	10,907
<i>Total, Marine</i>	33,904	a16,547	9,684	20,736	11,494	(a)3,430	266	96,061
Freshwater types	301	240	(b)	475	..	1	..	(c) 1,017
Grand Total	34,205	(a)16787	(c) 9,684	21,211	11,494	(a) 3,431	266	(c) 97,078

(a) 703,600 lb. taken by Victorian fishermen in Tasmanian waters is included in Victoria.
(b) Not available. (c) Excludes freshwater fish caught in Queensland, particulars of which are not available.

The total Australian production of these more common types of fish is shown in the following table for the years 1959–60 to 1963–64.

FISH: PRODUCTION, BY TYPE, AUSTRALIA
(‘000 lb. estimated live weight)

Type	1959–60	1960–61	1961–62	1962–63	1963–64
Marine types—					
Tuna	7,099	9,767	10,616	11,005	17,932
Mullet	12,340	11,362	13,242	13,736	12,496
Australian salmon	7,601	6,630	11,534	7,794	11,260
Shark	8,457	7,636	8,691	10,524	10,460
Flathead	4,902	5,141	6,458	6,828	6,151
Morwong	2,329	2,258	2,773	4,949	4,540
Barracouta	5,871	5,981	6,810	4,842	4,331
Snapper	4,602	4,684	3,756	4,107	4,160
Whiting	3,297	3,267	3,513	3,699	3,498
Mackerel	1,641	1,779	1,631	2,192	2,215
Garfish	1,024	1,315	1,465	1,645	1,740
Tailor	1,199	1,407	1,148	956	1,627
Luderick	1,199	1,096	1,020	1,311	1,293
Bream (incl. Tarwhine)	1,123	1,236	1,382	1,531	1,233
Leatherjacket	2,476	2,516	2,193	1,955	1,125
Ruff	1,506	1,288	1,188	1,360	1,093
Other	9,819	10,137	9,780	9,941	10,907
<i>Total, Marine</i>	<i>76,485</i>	<i>77,500</i>	<i>87,200</i>	<i>88,375</i>	<i>96,061</i>
Freshwater types	1,612	(a) 1,597	(a) 1,260	(a) 1,309	(a) 1,017
Grand Total	78,097	(a) 79,097	(a) 88,460	(a) 89,684	(a) 97,078

(a) Excludes freshwater fish caught in Queensland, particulars of which are not available.

(ii) *Crustaceans*. In terms of gross value of catch, the importance of crustaceans has increased in recent years, and in 1963-64 was greater than that of fish. The crayfish is the most important crustacean. The bulk of Australian production of crayfish is exported, nearly all going to the United States of America. Details of the production of crustaceans in each State and the Northern Territory in 1963-64 are shown in the following table.

CRUSTACEANS: PRODUCTION, BY TYPE, 1963-64
(*000 lb. whole weight)

Type	N.S.W.	Vic.	Q'land	S. Aust.	W. Aust.	Tas.	N.T.	Aust.
Crayfish(a) ..	400	(b) 1,317	47	4,325	17,973	(b) 3,572	..	27,634
Prawns ..	6,107	25	5,118	..	2,118	..	1	13,369
Crabs ..	103	..	571	..	30	..	4	708
Total ..	6,610	(b) 1,342	5,736	4,325	20,121	(b) 3,572	5	41,711

(a) Includes freshwater lobster caught in New South Wales and shovel-nosed lobster taken in Queensland. (b) The catch of crayfish by Victorian fishermen in Tasmanian waters (367,000 lb. in 1963-64) is included in Victoria.

The following table shows details of the production of crustaceans in Australia in the years 1959-60 to 1963-64.

CRUSTACEANS: PRODUCTION, BY TYPE, AUSTRALIA
(*000 lb. whole weight)

Type	1959-60	1960-61	1961-62	1962-63	1963-64
Crayfish(a)	28,023	27,494	29,355	31,400	27,634
Prawns	7,749	6,529	9,322	12,616	13,369
Crabs	1,044	787	875	842	708
Total	36,816	34,810	39,552	44,858	41,711

(a) Includes freshwater lobster caught in New South Wales and shovel-nosed lobster taken in Queensland.

(iii) *Molluscs (edible)*. Details of the production of molluscs in each State and the Northern Territory in 1963-64 are shown in the table below.

MOLLUSCS(a): PRODUCTION, BY TYPE, 1963-64
(*000 lb. gross (in shell) weight)

Type	N.S.W.	Vic.	Q'land	S. Aust.	W. Aust.	Tas.	Aust.
Scallops .. ..	..	10,434	679	..	(b)	4,260	(c)15,373
Oysters	12,462	69	170	..	72	2	12,775
Mussels .. ..	..	410	..	..	..	..	410
Squid .. ..	..	186	114	..	4	..	304
Abalone	36	47	..	2	..	72	157
Octopus .. ..	..	12	..	..	5	..	17
Cuttlefish .. ..	..	..	..	..	1	..	1
Total	12,498	11,158	963	2	82	4,334	(d)29,037

(a) Excludes pipis taken in New South Wales, details of which are not available for publication. (b) Not available for publication. (c) Excludes Western Australia. (d) Incomplete see footnote (c).

The following table shows the production of molluscs in Australia in the years 1959-60 to 1963-64.

MOLLUSCS(a): PRODUCTION BY TYPE, AUSTRALIA

('000 lb. gross (in-shell) weight)

Type	1959-60	1960-61	1961-62	1962-63	1963-64
Scallops	(b) 6,105	6,896	5,172	(b) 6,498	(b) 15,373
Oysters	(c) 12,690	14,220	12,613	13,029	12,775
Mussels	87	394	646	683	410
Squid	210	228	319	292	304
Abalone .. .. .	..	..	..	..	157
Octopus	52	36	58	18	17
Cuttlefish	60	34	7	1	1
Total	(d) 19,204	21,808	18,815	(d) 20,521	(d) 29,037

(a) Excludes pipis, particulars of which are not available for publication. (b) Excludes Western Australia, particulars of which are not available for publication. (c) Excludes Northern Territory. (d) Incomplete; see footnotes to individual types.

(iv) *Pearls, Pearl-shell and Trochus-shell.* Particulars of cultured pearl production are not available for publication.

In recent years the production of pearl-shell has declined, owing to the development of plastics. However, the advent of pearl culture has since created a growing demand for live pearl-shell. The following table gives details of pearl-shell and trochus-shell production in Australia for the years 1959-60 to 1963-64.

PEARL-SHELL AND TROCHUS-SHELL: PRODUCTION

('000 lb.)

Particulars	1959-60	1960-61	1961-62	1962-63	1963-64
Pearl-shell—					
Queensland(a)	1,082	1,821	860	788	578
Western Australia(b)	1,138	1,270	802	782	542
Northern Territory(a)	188	222	147	115	11
Australia	(c)2,408	(c)3,313	(c)1,809	1,685	1,131
Trochus-shell—					
Queensland(a)	847	309	457	357	142
Western Australia(b)	22	10	..	..	..
Australia	869	319	457	357	142

(a) Season ended January of years shown. Shell taken by Queensland luggers operating in Northern Territory waters is included in Queensland. (b) Season ended December of years shown. (c) Excludes pearl-shell taken by Japanese pearl-liners operating in Australian waters. The quantities taken were as follows:—1959-60, 763,000 lb.; 1960-61, 860,000 lb.; 1961-62, 813,000 lb. The Japanese pearling fleet did not operate in Australian waters after 1961-62.

Particulars of the production of natural pearls in Australia are not available.

(v) *Whales*. Only sperm whales were caught during the 1964 season and no quotas were imposed on the catch. Quotas previously set by the Department of Primary Industry for the baleen species were in terms of humpback whales, and for this purpose 1 blue whale was taken as the equivalent of 2 fin, 2½ humpback, 6 sei or 6 bryde whales.

The following table shows particulars of whales taken by Australian vessels for the years 1960 to 1964.

WHALES TAKEN: AUSTRALIA(a)

(Source: Fisheries Branch, Department of Primary Industry)

(Number)

Particulars	1960	1961	1962	1963	1964
Types of baleen whales taken—					
Humpback	1,355	1,311	716	87	..
Blue	2	..	..	1	..
Bryde .. .. .	..	2	..	..	..
Sei .. .. .	..	..	2	..	..
Sex of baleen whales—					
Male	767	755	404	37	..
Female	590	556	314	51	..
<i>Total Baleen Whales Taken</i>	<i>1,357</i>	<i>b 1,313</i>	<i>718</i>	<i>88</i>	<i>..</i>
Humpback Equivalent(c)	1,360	1,312	717	89	..
Quota of Humpback Whales(c)	1,680	1,390	1,300	550	..
<i>Sperm Whales Taken</i>	<i>282</i>	<i>454</i>	<i>591</i>	<i>598</i>	<i>710</i>
Sex of sperm whales—					
Male	274	451	570	587	695
Female	8	3	21	11	15
Total Whales Taken	1,639	1,767	1,309	686	710

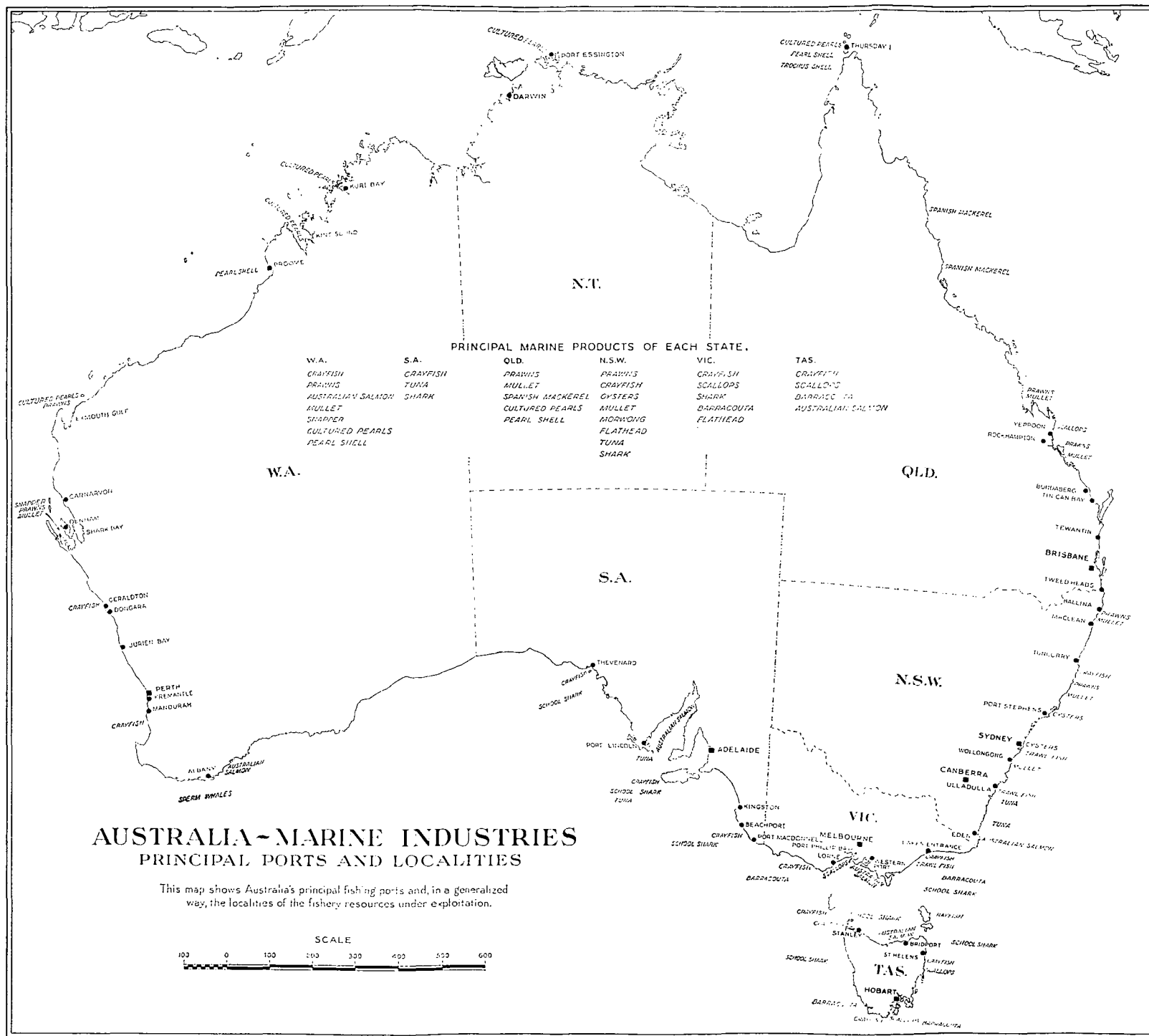
(a) Excludes details of Norfolk Island.

(b) The sex of two whales processed was not recorded.

(c) See text above.

2. *Processing*.—(i) *Fish*. Quick-freezing is used at sea and ashore to preserve fish before delivery to consumers. The main technique employed in Australia is brine-freezing, as used extensively in the tuna and salmon fisheries.

Fish canning in Australia on a modern scale dates from 1937, before which the only fish canning carried out was on an occasional basis by factories handling other foodstuffs. In 1963-64 there were 14 canneries in Australia dealing exclusively with marine products, as well as several other canneries using small amounts of fish in general canning operations. The main canneries handle tuna (Eden, New South Wales; Melbourne, Victoria; Port Lincoln, South Australia); Australian salmon (Eden, New South Wales; Melbourne, Victoria; Margate, Tasmania; Port Lincoln and Adelaide, South Australia; Albany, Western Australia); and barracouta (Melbourne and Portland, Victoria; Margate, Tasmania).



Other methods of fish processing include smoking and bottling, but these are undertaken on a minor scale only. Among the few fish by-products produced are small quantities of fish meal.

The following table gives further details of fish processing in Australia during the years 1959-60 to 1963-64.

FISH PROCESSING (EXCEPT FREEZING): AUSTRALIA

Particulars	1959-60	1960-61	1961-62	1962-63	1963-64
Number of factories	19	18	20	25	25
	'000 lb.	'000 lb.	'000 lb.	'000 lb.	'000 lb.
Fish used(a)—					
Whole	12,507	13,737	18,494	15,447	17,846
Headed and/or gutted	3,773	3,758	6,796	4,972	5,083
<i>Estimated live weight equivalent(b)</i>	16,900	18,200	26,500	21,300	23,800
Production(c)—					
Canned fish(d)—					
Australian salmon	4,550	3,480	5,772	3,976	5,394
Tuna	1,983	3,070	3,624	4,201	4,704
Other	1,585	1,647	2,644	2,066	1,158
<i>Total</i>	8,118	8,197	12,040	10,243	11,256
Smoked fish	296	301	181	286	273
Fish paste	1,379	1,261	1,027	1,053	1,196
Fish meal(e)	1,718	2,041	2,640	2,076	2,068

(a) Fish used for canning (including fish loaf), smoking and the manufacture of fish paste, but excluding the weight of oysters, other shellfish and crustaceans used for canning. (b) The weight of headed and/or gutted fish is taken as 85 per cent. of live weight. (c) Excludes canned crayfish, lobsters, prawns, oysters and clams, details of which are not available for publication. (d) Includes fish loaf, fish cakes, etc. (e) Excludes whale meal.

(ii) *Crustaceans and Molluscs.* Quick-freezing is also used to preserve crustaceans and molluscs. The chief technique employed to preserve crayfish and scallops is air blast freezing, while plate contact freezing is being used on an ever increasing scale for prawns, scallops and abalone.

Crayfish for the domestic market are usually cooked whole and then frozen, as are some exported crayfish. However, the major proportion of crayfish exports consists of frozen, raw craytails.

Most prawns for domestic consumption are sold in a whole cooked condition. Some are also exported in this form, after freezing. As a rule, however, the majority of prawn exports consists of green headless prawns, sometimes de-veined, sometimes split in "butterfly" style, but in all cases frozen into five-pound blocks.

Scallops are normally frozen in cello-wrapped five-pound blocks, although packaging of individually frozen scallops in polythene pouches is growing in popularity for local consumer packs.

Canned abalone is now packed for the Asian market, as well as abalone soup for domestic and oversea sale.

(iii) *Whales*. Oil from sperm whales is used in the manufacture of soap, plastics and watch lubricants, and in automatic transmission systems in motor cars. The following table shows details of whale processing during the years 1960 to 1964.

WHALE PROCESSING: AUSTRALIA^(a)

Particulars	1960	1961	1962	1963	1964
Whale oil produced—			(b)	(b)	(b)
Baleen oil barrels ^(c)	69,738	59,187	30,849	3,865	..
Sperm oil „	11,312	18,929	24,833	23,860	27,534
Value of whale oil produced .. £'000	1,171	1,180	782	443	310
Value of by-products (meal, meat, solubles, etc.) „	320	346	224	69	60
Total Value.. .. . „	1,491	1,526	1,006	512	370

(a) Excludes details of Norfolk Island.
research.

(c) 6 barrels = 1 ton.

(b) Includes produce from whales taken for scientific

3. Domestic Marketing.—Although virtually the whole of the tuna and Australian salmon catches and a large proportion of the barracouta catch are canned, the greater part of Australian fisheries production is marketed fresh or frozen.

Marketing arrangements for fresh fish vary from State to State. In New South Wales fish marketing is the responsibility of the New South Wales Fish Authority, which operates the Metropolitan and Wollongong Fish Markets.

In other coastal centres of New South Wales fishermen's co-operatives may become registered as local fish markets. Fish for industrial use do not pass through any of these markets. The Queensland Fish Board sells all production on behalf of fishermen in that State, and has branches in 18 centres, as well as depots at eight others. The Board also purchases fish on its own account to stabilize prices. In Victoria, Western Australia, and Tasmania the marketing of fish is undertaken through agents. In South Australia the great majority of the fishermen are members of the South Australian Fishermen's Co-operative Ltd., which handles the whole of their production. Canned fish and frozen fish in the form of consumer packs are marketed mainly by the supermarket-type retail establishments. Oysters are usually sold live in the shell directly to restaurants, or are shelled and bottled before being sent to retailers.

4. Value of Production.—(i) *Gross Value of Products*. The following table shows details of gross values of production at principal markets of edible fisheries products, pearl-shell, and trochus-shell in each State and the Northern Territory in 1963–64.

FISHERIES PRODUCTION: GROSS VALUE, 1963-64

(£'000)

Product	N.S.W.	Vic.(a)	Qld	S. Aust.	W. Aust.	Tas.(a)	N.T.	Aust.
Fish(b)	2,314	1,766	737	1,149	688	156	22	6,832
Crustaceans ..	1,204	353	953	835	3,678	790	1	7,814
Molluscs (edible) ..	(c) 1,171	298	45	n.a.	(d) 5	156	..	1,675
Pearl-shell(e) .. ..	..	..	(f) 85	..	(g) 109	..	(f) 1	195
Trochus-shell .. ..	..	..	(f) 5	..	..	..	..	5

(a) Victorian figures include catch by Victorian fishermen in Tasmanian waters (shark, £54,000; crayfish, £96,000). (b) Includes shark livers for oil extraction; excludes freshwater fish caught in Queensland, particulars of which are not available. (c) Excludes pipis, particulars of which are not available for publication. (d) Excludes scallops, particulars of which are not available for publication. (e) Queensland figure includes pearl-shell taken by Queensland luggers operating in Northern Territory waters. (f) Season ended January. (g) Season ended December.

The table below gives this information for Australia for the years 1959-60 to 1963-64.

FISHERIES PRODUCTION: GROSS VALUE, AUSTRALIA

(£'000)

Product	1959-60	1960-61	1961-62	1962-63	1963-64
Fish(a)	5,851	5,907	6,075	6,142	6,832
Crustaceans	5,561	5,906	7,477	8,006	7,814
Molluscs (edible)(b) ..	1,089	1,186	1,252	1,404	1,675
Pearl-shell(c)	(d) 558	(d) 724	(d) 361	334	195
Trochus-shell(c)	78	27	28	18	5

(a) Includes shark livers for oil extraction; excludes freshwater fish caught in Queensland in 1960-61 and subsequent years. (b) Excludes pipis in New South Wales and scallops in Western Australia for all years, and oysters in the Northern Territory for 1959-60. (c) Season ended December (Western Australia) or January (Queensland and Northern Territory) of years shown. (d) Excludes pearl-shell taken by Japanese pearl-liners in Australian waters. The Japanese pearling fleet did not operate in Australian waters after 1961-62.

(ii) *Gross and Local Values, 1963-64.* Gross and local values of fishing and whaling production for each State are shown in the following table. A more detailed reference to the value of production of fishing and whaling and other industries in Australia, as well as a brief explanation of the terms used, is included in Chapter XXX. Miscellaneous.

**FISHING AND WHALING: GROSS AND LOCAL VALUE OF PRODUCTION,
1963-64**

(£'000)

State or Territory		Gross value(a)	Marketing costs	Local value(b)
New South Wales	.. ..	4,690	762	3,928
Victoria	.. ..	2,417	316	2,101
Queensland	.. ..	2,363	201	2,162
South Australia	.. ..	1,984	266	1,718
Western Australia	.. ..	5,094	50	5,044
Tasmania	.. ..	1,102	239	863
Northern Territory	.. ..	26	n.a.	26
Australia	.. ..	17,676	1,834	15,842

(a) Gross production valued at principal markets.

(b) Gross production valued at place of production.

(iii) *Local Values, 1959-60 to 1963-64.* In the following table, the local value of fisheries production and the local value per head of population are shown by States. Because the value of materials used in the course of production is not available for all States, it is not possible to show a comparison of net values.

FISHING AND WHALING: LOCAL VALUE OF PRODUCTION

Year	N.S.W.	Vic.	Qld	S. Aust.	W. Aust.	Tas.	Aust.(a)
LOCAL VALUE							
(£'000)							
1959-60	3,101	1,771	1,448	975	4,276	683	12,325
1960-61	3,299	1,787	1,372	1,237	4,220	813	12,813
1961-62	3,288	1,741	1,633	1,379	5,291	909	14,294
1962-63	3,800	1,624	1,922	1,473	5,564	885	15,311
1963-64	3,928	2,101	2,162	1,718	5,044	863	15,842

LOCAL VALUE PER HEAD OF POPULATION

(£)

1959-60	0.8	0.6	1.0	1.0	6.0	2.0	1.2
1960-61	0.9	0.6	0.9	1.3	5.8	2.3	1.2
1961-62	0.9	0.6	1.1	1.4	7.1	2.6	1.4
1962-63	0.9	0.6	1.2	1.5	7.2	2.5	1.4
1963-64	1.0	0.7	1.4	1.7	6.4	2.4	1.4

(a) Includes Northern Territory.

§ 7. Consumption of Edible Marine Products

Particulars of the estimated supplies of fish, crustaceans and molluscs available for consumption per head of population, in terms of edible weight, are included in the table below. For the purpose of compiling this table, an allowance has been made for the non-commercial fish catch.

MARINE PRODUCTS: ESTIMATED SUPPLIES AVAILABLE FOR CONSUMPTION, AUSTRALIA
(lb. edible weight per head per annum)

Particulars	1959-60	1960-61	1961-62	1962-63	1963-64
Fresh or frozen—					
Fish—					
Australian origin	3.2	3.1	3.1	3.3	3.3
Imported	3.2	3.0	2.7	2.7	3.1
Crustaceans and molluscs	1.0	1.2	1.0	1.3	1.2
Cured (including smoked and salted)	1.1	1.1	0.9	1.0	1.0
Canned—					
Australian origin	0.8	0.7	0.8	0.9	0.8
Imported	2.0	2.6	2.0	1.9	2.3
Total	11.3	11.7	10.5	11.1	11.7

§ 8. Oversea Trade in Marine Products

NOTE.—Values shown are expressed as £A. f.o.b. port of shipment. The tables of exports relate to Australian produce only, but quantities and values quoted in the text sometimes include re-exports, the amounts involved, however, generally being small.

1. **Edible Products.**—A large proportion of the fish consumed in Australia is imported. Of the edible products imported in 1963-64, those originating in United Kingdom were valued at £2.8 million (25 per cent. of the total value), Japan, £2.4 million (21 per cent.), South Africa, £1.2 million (11 per cent.), and Canada, £1.1 million (10 per cent.).

The United Kingdom supplied 13.3 million lb. (33 per cent., valued at £1.9 million) of the fresh or frozen fish products imported in 1963-64, South Africa, 6.9 million lb. (17 per cent. valued at £0.6 million), Denmark, 5.0 million lb. (12 per cent. valued at £0.7 million), and New Zealand, 4.9 million lb. (12 per cent., valued at £0.5 million). Of the smoked or dried fish products imported in 1963-64, South Africa supplied 5.3 million lb. (62 per cent., valued at £0.6 million) and the United Kingdom, 2.7 million lb. (32 per cent. valued at £0.3 million). Japan supplied 9.6 million lb. (38 per cent., valued at £2.2 million) of the canned fish products imported in 1963-64.

The value of exports of edible products in 1963-64 was 13 per cent. more than that in 1962-63. The value of crayfish tails exported in 1962-63 was 78 per cent. of the value of all exports of edible products. Of all crayfish tails exported in 1963-64, 89 per cent. (8,290,000 lb., valued at £4,977,000) were consigned to the United States of America.

The table below gives further details of Australia's overseas trade in edible products in the years 1961-62, 1962-63 and 1963-64.

OVERSEA TRADE IN EDIBLE MARINE PRODUCTS: AUSTRALIA

Particulars	Quantity ('000 lb.)			Value (£A.'000 f.o.b.)		
	1961-62	1962-63	1963-64	1961-62	1962-63	1963-64
IMPORTS						
Fresh and frozen(a)	32,290	33,630	40,177	3,561	3,822	5,192
Smoked and dried	8,359	8,945	8,523	718	835	956
Potted and concentrated(b) ..	177	256	184	58	94	65
Canned—						
Herrings	4,504	3,333	4,376	473	376	467
Salmon	9,370	9,158	11,642	2,211	2,255	2,737
Sardines and pilchards ..	5,460	6,136	6,494	884	960	984
Tuna	709	415	497	96	61	74
Other fish	1,251	1,869	1,192	147	163	132
Crustaceans and molluscs ..	736	619	886	276	224	290
<i>Total, Canned</i>	<i>22,030</i>	<i>21,530</i>	<i>25,087</i>	<i>4,087</i>	<i>4,039</i>	<i>4,684</i>
Products not elsewhere included	..	..	..	112	141	200
Grand Total .. ..	..	..	..	8,536	8,931	11,097

EXPORTS

(Australian produce only; excludes re-exports)

Fresh or frozen(c)—						
Crayfish tails	9,875	9,002	9,412	6,020	5,169	5,569
Whole crayfish	513	1,380	1,325	173	478	452
Fish	1,351	1,635	3,338	166	127	217
Other	195	1,260	2,374	66	494	865
Canned—						
Salmon	30	38	47	6	7	8
Other fish	130	113	155	17	12	16
Crustaceans and molluscs ..	57	25	87	17	11	17
<i>Total, Canned</i>	<i>217</i>	<i>176</i>	<i>289</i>	<i>40</i>	<i>30</i>	<i>41</i>
Products not elsewhere included	..	..	..	3	2	13
Grand Total .. ..	..	..	..	6,468	6,300	7,157

(a) Excludes frozen smoked, which is included with "Smoked and dried". (b) Includes extracts and caviare. (c) Excludes frozen smoked, which is included in item Products not elsewhere included.

2. Pearls.—Cultured pearls valued at £323,000 were imported into Australia in 1963–64. This was 32 per cent. greater than the value imported in 1962–63 (£245,000). In 1963–64 imports of cultured pearls valued at £319,000 (99 per cent. of the total value of cultured pearl imports) originated in Japan.

Cultured pearls exported from Australia in 1963–64 were valued at £316,000, £45,000 less than 1962–63. In 1963–64 cultured pearl exports consigned to Japan were valued at £310,000, 98 per cent. of the value of all cultured pearls shipped in that year.

The value of natural pearls exported from Australia in 1963–64 was £167,000, an increase of £161,000 compared with 1962–63 (£6,000). In 1963–64 natural pearls consigned to Japan were valued at £155,000, 93 per cent. of the value of all natural pearls shipped in that year.

3. Shells.—Of the pearl-shell exported in 1963–64, 431,000 lb. (35 per cent.) were consigned to the Federal Republic of Germany, 391,000 lb. (31 per cent.) to Japan, and 240,000 lb. (19 per cent.) to the United States of America. Of the trochus-shell exported, 122,000 lb. (41 per cent.) were consigned to Italy, and 108,000 lb. (36 per cent.) to the Federal Republic of Germany.

Imports of shells included quantities of pearl, trochus and green snail shell from New Guinea, Papua and the Pacific Islands, which were subsequently re-exported from Australia.

Further particulars of Australia's oversea trade in shells are shown in the table below.

OVERSEA TRADE IN SHELLS: AUSTRALIA

Particulars	Quantity ('000 lb.)			Value (£A.'000 f.o.b.)		
	1961–62	1962–63	1963–64	1961–62	1962–63	1963–64
IMPORTS						
Total	96	105	166	14	10	16
EXPORTS						
(Australian produce only; excludes re-exports)						
Pearl-shell	1,999	1,811	1,226	384	343	201
Trochus-shell	567	176	295	44	12	15
Other	22	38	61	4	5	10
Total	2,588	2,025	1,582	432	360	226

4. Marine Animal Oils.—Details of oversea trade in marine animal oils are shown in the table below.

OVERSEA TRADE IN MARINE ANIMAL OILS: AUSTRALIA

Particulars	Quantity ('000 gals.)			Value (£A.'000 f.o.b.)			
	1961-62	1962-63	1963-64	1961-62	1962-63	1963-64	
IMPORTS							
Whale oil from—							
Netherlands	24	78	..	7	38	
Japan	311	527	..	99	233	
Other countries	497	75	48	209	47	39
<i>Total, Whale Oil</i>	497	410	653	209	153	310
Cod liver oil	94	95	86	45	44	38
Unrefined fish oils	100	107	120	58	50	56
Other	36	28	45	21	20	28
Grand Total	727	640	904	333	267	432

EXPORTS

(Australian produce only; excludes re-exports)

Whale oil .. ..	..	1,900	950	1,253	671	322	464
Other .. ..	..	10	1	43	48	5	2
Total .. ..	..	1,910	951	1,296	719	327	466