

## CHAPTER 25

### FISHERIES

Further information on subjects dealt with in this chapter is contained in the annual printed bulletin *Non-Rural Primary Industries* (10.23) and in the annual mimeographed statistical bulletins *Fisheries* (10.8)(10.9), particularly as regards types of fish, etc. caught.

#### Fisheries resources and their commercial exploitation

##### Fish

Approximately 2,000 species of marine and freshwater fish occur in and around Australia, about forty of which support substantial commercial fisheries. Most fishing is confined to waters over the continental shelf on the populous eastern and south-eastern seaboard, including Tasmania and South Australia, and off the south-western corner of the continent. As in other countries, fisheries in Australia may be divided into estuarine fisheries, located in the tidal waters of rivers and coastal lakes, beaches and bays; pelagic fisheries, which exploit species inhabiting the surface layers of the open ocean; and demersal fisheries, which fish the bottom layers of the sea. Estuarine fisheries produce considerable quantities of mullet (mainly *Mugil cephalus*), bream (*Acanthopagrus spp.*) and, in northern Australia, the valuable giant perch (*Lates calcarifer*). Important freshwater fisheries in New South Wales, Victoria and South Australia include those for Murray cod (*Maccullochella macquariensis*), golden perch (*Plectroplites ambiguus*) and eels (*Anguilla australis occidentalis*). Rainbow trout are farmed in Tasmania. Important pelagic fisheries include those for Australian 'salmon' (*Arripis trutta*), southern bluefin tuna (*Thunnus thynnus maccyii*), snoek (*Leionura artun*), mackerel (*Cybius spp.*) and clupeoids (*Sardinops neopilchardus* and *Engraulis australis*). Demersal fisheries include those for snapper (*Chrysophrys auratus*), whiting (*Sillaginidae*) and the so called 'cods' (*Epinephelus*, etc.) from tropical waters. Trawl fisheries off New South Wales and Victoria yield species such as flathead (*Neoplatycephalus* and *Trudis spp.*), morwong (*Nemadactylus spp.*) and John Dory (*Zeus faber*). There is also an important fishery for edible shark (*Galeorhinus australis* and *Mustelus antarcticus*) in south-eastern Australia. A fishery for clupeoids in the Bass Strait which supplies the raw material for a fish meal plant at Lakes Entrance, Victoria, is the only 'industrial fishery' in Australia.

##### Crustaceans

The western and southern rock lobsters (*Panulirus cygnus* and *Jasus novaehollandiae*) which are taken on rocky reefs around the southern half of Australia, provide the most valuable fishery in Australia. Prawns (*Penaeus* and *Metapenaeus spp.*) are taken in estuarine, coastal and offshore waters of all States except Tasmania. This fishery has grown rapidly in recent years, especially in northern Australia. Bay lobsters (*Thenus spp.*) are taken incidentally to prawn trawling operations. Crabs (*Scylla* and *Portunus spp.*) are taken mainly in Queensland, New South Wales and Western Australia.

##### Molluscs (edible)

Naturally occurring oysters are harvested in all States; and in New South Wales and Queensland the Sydney rock oyster (*Crassostrea commercialis*) is cultured commercially. There is limited culture of other species in Tasmania and, recently, South Australia. Following a serious decline in catches in the scallop (*Pecten alba*) fishery based on stocks in Port Phillip Bay, Victoria, new offshore beds have been located in southern New South Wales, eastern Victoria and south-western Western Australia. However, substantial fluctuations in abundance results in erratic variation in production from year to year. A fishery based on the saucer scallop (*Amusium balloti*) is developing in another area of Western Australia, and there is a similar fishery in Queensland. An important abalone fishery has been developed since 1964 in south-east Australia with Tasmania, Victoria and South Australia providing the bulk of the catch. Mussels (*Mytilus planulatus*) are harvested in Victoria, and small quantities of cephalopods, mainly squid, are produced in many localities.

### 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, *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.

### Whales

The Australian whaling industry formerly exploited the baleen (humpback) whales 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 catodon*) which has been taken in the southern waters of Western Australia since 1955. Processing operations were carried out by several shore stations, but now only one station at Albany, Western Australia, is still operating.

### Marine flora

The only substantial commercial collection of seaweed in Australia is undertaken at Triabunna, Tasmania, where a factory is processing seaweed (*Macrocystis pyrifera*) for its alginic content.

### General

A map showing Australia's principal ports and localities of the fishery resources under exploitation appears on plate 49, page 882. Detailed information on the history of the development of fisheries industries in Australia is given in Year Book No. 55, pages 976-7.

## Fisheries administration and research

The Constitution of the Commonwealth (Section 51 (x)) assigns to the Commonwealth power to legislate for fisheries in Australian waters beyond territorial limits, the residual power in respect of waters within territorial limits (including inland waters) resting with the States. The Commonwealth has made similar arrangements for each of its Territories. Each State and Territory has legislation regulating fisheries in waters within its jurisdiction. Persons taking fish for sale, and their boats, are required to be licensed, and provision is made for management of the fisheries.

The Commonwealth laws regulating the fisheries are the *Fisheries Act 1952-1970*, the *Continental Shelf (Living Natural Resources) Act 1968* and the *Whaling Act 1960-1966*. Each of these applies in accordance with the Commonwealth's fishery power under the Constitution.

### Fisheries Act

This Act requires persons engaging in fishing and boats used for fishing to be licensed and their equipment for taking fish to be registered if the purpose of the fishing is commercial. It also provides for management and conservation of the fisheries. The Act applies to Australian residents and their boats in waters proclaimed under the Act and, since 1968, to foreign boats and their crews in the zone of waters extending 12 miles from the baselines of the territorial sea but excluding waters within territorial limits, where State law applies.

### Continental Shelf (Living Natural Resources) Act

This Act implements in Australian law the sovereign rights, conferred on Australia in respect of the organisms belonging to sedentary species (that is, organisms which, at the harvestable stage, either are immobile on or under the seabed, or are unable to move except in constant physical contact with the seabed or the subsoil) on the continental shelf. The continental shelf comprises the seabed and subsoil of the submarine areas adjacent to the coast but outside the territorial sea to a depth of 200 metres, or beyond that depth where the depth of the superjacent waters admits of the exploitation of the natural resources of the area, by the Convention on the Continental Shelf, Geneva, 1958. The Act requires the licensing of persons searching for and taking sedentary organisms, of boats used to search for and take sedentary organisms, and of persons employing divers, trial divers and divers' tenders in taking sedentary organisms, if such activities are carried out in controlled areas of the continental shelf of Australia or the Territories for a commercial purpose. Provision is made for proclamation of sedentary organisms to which the Act applies, for the establishment of controlled areas of continental shelf in respect of specified sedentary organisms, and for the management and conservation of sedentary organisms in controlled areas (the last of these applying to all persons whether the purpose of the taking of the sedentary organism was commercial or not). The Act applies to all persons including foreigners, and to all boats including foreign boats.

### Whaling Act

This Act implements in Australian law the obligations imposed on Australia by virtue of our adherence to the International Convention for the Regulation of Whaling, Washington, 1946. The Act requires the licensing of factories engaged in treating whales and of ships (and aircraft) used for taking whales. It also provides for the management and conservation of whale stocks.

### Administration

Australian fisheries are administered by the authority having jurisdiction over the waters concerned. In inland waters and in waters within territorial limits, administration is the responsibility of the State or Territory fisheries authority. In proclaimed waters, and on the continental shelf beyond territorial limits, administration is the responsibility of the Commonwealth which, by agreement, has delegated to State fisheries authorities the necessary authorities for day-to-day administration of the Acts.

The administration of the fisheries is directed to a number of objectives, of which the two most important are conservation of the living resources in order to ensure their ability to sustain a maximum yield consistent with economy in their exploitation and the orderly conduct of the fishing industry. Fishery resources are common property and apart from fisheries such as those for rock lobster and abalone, where the numbers of boats and the quantities of fishing gear are controlled, the only other restrictions on the entry of boats into the Australian fishing industry are those relating to foreigners, and to processing and carrying boats in the northern prawn fishery. Management measures have been introduced in several fisheries to provide controls such as minimum sizes, closed areas, closed seasons and regulation of the types of fishing gear that may be used.

The Fisheries Development Trust Account (established under the *Fishing Industry Act 1956*) and the Fishing Industry Research Trust Account (established under the *Fishing Industry Research Act 1969*) are available to support financially projects of kinds consistent with the purposes of those Acts for the development and management of the fisheries and fishing industry. The former is supported by the proceeds of the sale of the assets of the Australian Whaling Commission. The latter is a matching fund into which is paid each year an appropriation from Commonwealth Revenue equal to amounts collected from the fishing industry by the State Fisheries Authorities and expended by the States for the same purposes.

### Research

The main aim of fisheries research in Australia is to provide a background of biological, technical and economic information which will provide guidance for the efficient and rational utilisation of fisheries resources. To this end much of the research already undertaken has been directed at formulating recommendations for management of 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, greater economy in operations and the use of more efficient equipment and methods.

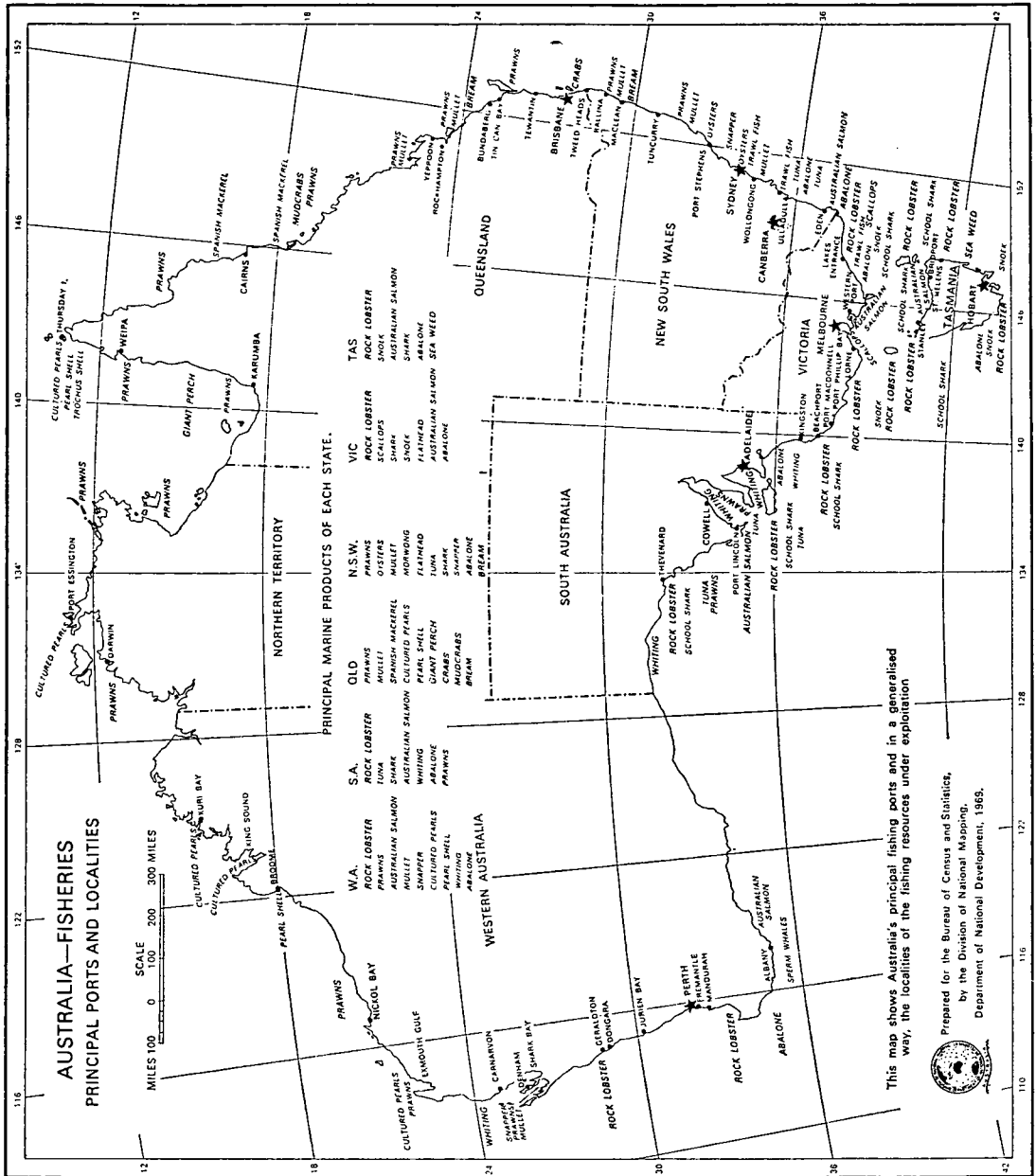
Organisations in Australia at present engaged in research into fisheries matters are:

- (i) C.S.I.R.O. Division of Fisheries and Oceanography, with its headquarters and main laboratory at Cronulla, N.S.W. (fisheries science and oceanography);
- (ii) C.S.I.R.O. Division of Food Research; main laboratories located at Ryde, N.S.W. (handling, storage, processing and transportation of fish);
- (iii) State fisheries departments (fisheries laboratories have been established in Perth, Hobart, Melbourne, Sydney and Brisbane; new research vessels have been launched by Victoria, New South Wales, Tasmania and Western Australia; the Northern Territory Administration has recently established a Prawn Research Unit in Darwin);
- (iv) Fisheries Division, Department of Primary Industry, Canberra (economic and management research, gear technology, extension and education service); and
- (v) private fishing companies (surveys of fisheries resources, research into handling and processing).

## Collection and presentation of fisheries statistics

### 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. The Fisheries division of the Department of Primary Industry has supplied particulars of the whaling



This map shows Australia's principal fishing ports and in a generalised way, the localities of the fishing resources under exploitation.

Prepared for the Bureau of Census and Statistics,  
by the Division of National Mapping,  
Department of National Development, 1968.



PLATE 49

industry and pearl-shell fishery. Statistics of the processing of general fisheries products and of overseas 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 overseas 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 an 'estimated live 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.

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.). Recognising these weaknesses, the Commonwealth-States 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'.

#### 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-State Fisheries Conference in 1962. The new system was introduced in Tasmania in 1963, in Victoria and Western Australia in 1964 and in South Australia in 1969. The system was introduced in Queensland for the otter trawl fishery early in 1965, but there are no definite plans at present to extend it to other fisheries.

Under the new system fishermen are asked to report monthly the various fishing methods used, catch of each species taken and the locality where the greatest proportion of the catch is taken. Fishermen 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.

## Boats and equipment used in fisheries

### 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 up to 120 feet in length and are almost invariably powered by diesel engines. Most of them have either insulated holds and carry ice, or are equipped with dry or brine refrigeration. Some rock lobster vessels are fitted with wells in which the catch is kept alive. About 25 per cent of the vessels registered in Australia for commercial fishing are over 30 feet in length. Recently, a number of well equipped, double rigged, prawn trawlers of 60 feet to 85 feet in length have been built for the rapidly developing northern prawn fisheries.

The following are the types of equipment most commonly used in the main fisheries: *mullet*, beach seine, gill net; *shark (edible)*, long-lines, gill net; *Australian Salmon*, beach seine; *snoek*, trolling lines; *flathead*, Danish seine, otter trawl; *snapper*, long-lines, traps, gill net, hand-line; *morwong*, Danish seine, otter trawl, traps; *whiting*, handlines, Danish seine, beach seine, gill net; *garfish*, beach seine; *mackerel*, trolling lines; *tuna*, pole and live-bait, trolling lines (lampara nets and purse seines are used for taking live bait for tuna); *prawns*, otter trawl, beam trawl, beach seine net; *rock lobster*, pots, traps; *scallops*, dredge, otter trawl; and *abalone*, diving using hookah gear.

### Pearls, pearl-shell and trochus-shell

Ketch-rigged luggers about fifty-five feet long which carry crews of eight to fourteen members are used for pearl-shell fishing in northern Australia.

### Whaling

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

**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 below 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.

**FISHERIES: BOATS AND EQUIPMENT EMPLOYED AND WHALING STATIONS  
OPERATING, STATES AND NORTHERN TERRITORY, 1970-71**

		<i>N.S.W.</i>	<i>Vic.</i>	<i>Qld</i>	<i>S.A.</i>	<i>W.A.</i>	<i>Tas.</i>	<i>N.T.</i>	<i>Aust.</i>
General fisheries—									
Boats employed . . . . .	No.	2,604	815	1,629	2,162	1,456	529	127	9,322
Value of boats and equipment	\$'000	10,605	7,036	18,604	11,479	19,460	6,858	5,668	79,711
Edible oyster fisheries—									
Boats employed . . . . .	No.	1,699	..	130	..	..	n.a.	..	(a)1,829
Value of boats and equipment	\$'000	1,746	..	(b)98	..	..	n.a.	..	(a)1,844
Pearl-shell and trochus-shell—									
Boats employed(c) . . . . .	No.	..	..	14	..	12	..	2	28
Whaling(c)—									
Chasers . . . . .	No.	..	..	..	..	3	..	..	3
Stations operating . . . . .	..	..	..	..	..	1	..	..	1

(a) Incomplete: see individual States. (b) Incomplete: figure for value of equipment not available. (c) Source: Department of Primary Industry.

**FISHERIES: BOATS AND EQUIPMENT EMPLOYED AND WHALING STATIONS  
OPERATING, AUSTRALIA, 1966-67 TO 1970-71**

		1966-67	1967-68	1968-69	1969-70	1970-71
General fisheries—						
Boats employed . . . . .	No.	8,991	9,354	9,244	(a)8,857	(a)9,322
Value of boats and equipment . . . . .	\$'000	46,102	51,456	(b)64,072	(b)71,376	(b)79,711
Edible oyster fisheries—						
Boats employed . . . . .	No.	1,549	(c)1,599	(c)1,788	(c)1,805	(c)1,829
Value of boats and equipment . . . . .	\$'000	(d)1,127	(e)1,444	(e)1,744	(e)1,741	(e)1,844
Pearl-shell and trochus-shell—						
Boats employed(f) . . . . .	No.	42	49	33	29	28
Whaling(f)—						
Chasers . . . . .	No.	3	3	3	3	3
Stations operating . . . . .	..	1	1	1	1	1

(a) Not comparable with 1968-69 and earlier years because of changes in basis of counting in South Australia. (b) Not comparable with 1967-68 and earlier years because of changes in methods of valuation in Western Australia. (c) Incomplete: figure for Tasmania is not available. (d) Incomplete; figure for value of equipment in Queensland is not available. (e) Incomplete: figures for value of boats and equipment in Tasmania and equipment in Queensland are not available. (f) Source: Department of Primary Industry.

## Employment in fisheries

### Persons engaged in fishing activities, 1966 census

The number of persons whose industry statements were classified to 'fishing' at the 1966 census was 8,021 out of a total of 512,994 in all primary industries and 4,856,455 in the total work force. The census classification 'fishing' includes such activities as fishing, whaling, pearl-shell fishing, oyster-farming, etc. For further information see the chapter Employment and Unemployment, also 1966 Census Bulletin No. 9.6, *Population: By Industry and Occupational Status, Australia*.

### Classification of registered commercial fishermen by industry

The following two tables 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 fishing industries in the several States. 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.

PERSONS ENGAGED IN FISHERIES: STATES AND NORTHERN TERRITORY 1970-71

Industry	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
General fisheries . . . . .	3,975	1,504	3,035	3,243	2,890	1,090	542	16,279
Edible oyster fisheries . . . . .	1,238	..	353	..	5	n.a.	..	(a)1,596
Pearl-shell and trochus-shell(b) . . . . .	..	..	271	..	120	..	25	416
Whaling(b)—								
At sea . . . . .	..	..	..	..	51	..	..	51
Ashore . . . . .	..	..	..	..	48	..	..	48

(a) Incomplete: see individual States. (b) Source: Department of Primary Industry.

PERSONS ENGAGED IN FISHERIES: AUSTRALIA, 1966-67 TO 1970-71

Industry	1966-67	1967-68	1968-69	1969-70	1970-71
General fisheries . . . . .	12,657	14,965	16,460	(a)15,629	(a)16,279
Edible oyster fisheries . . . . .	1,249	(b)1,319	(b)1,425	(b)1,717	(b)1,596
Pearl-shell and trochus-shell(c) . . . . .	571	538	473	422	416
Whaling(c)—					
At sea . . . . .	45	45	48	51	51
Ashore . . . . .	43	40	32	48	48

(a) Not comparable with 1968-69 and earlier years because of changes in basis of counting in South Australia. (b) Incomplete: figure for Tasmania is not available. (c) Source: Department of Primary Industry.

Production, processing and domestic marketing of fisheries products

Value of fisheries production

The following table shows the gross value and local value of fishing and whaling production 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. (See also the chapter Miscellaneous for an explanation of the value terms used.)

FISHERIES: GROSS AND LOCAL VALUE OF PRODUCTION  
STATES AND NORTHERN TERRITORY, 1966-67 TO 1970-71  
(\$'000)

Year	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
GROSS VALUE								
1966-67 . . . . .	10,473	4,980	6,959	6,175	16,525	3,653	82	48,847
1967-68 . . . . .	12,028	5,725	7,309	6,993	21,954	4,473	107	58,589
1968-69 . . . . .	11,517	5,933	8,089	7,683	23,717	4,864	1,191	62,994
1969-70 . . . . .	13,467	5,979	8,034	8,135	19,660	4,043	3,979	63,297
1970-71 . . . . .	15,329	7,310	10,985	9,237	25,127	5,984	4,424	78,395
LOCAL VALUE(a)								
1966-67 . . . . .	8,836	4,307	6,436	5,420	16,469	3,024	82	44,574
1967-68 . . . . .	10,212	5,153	6,896	6,162	21,805	3,668	107	54,003
1968-69 . . . . .	9,984	5,336	7,679	6,773	23,600	4,100	1,191	58,663
1969-70 . . . . .	11,514	5,304	7,609	7,183	19,536	3,343	3,979	58,468
1970-71 . . . . .	13,224	6,462	10,458	8,177	25,028	5,116	4,424	72,888

(a) Local value is gross value less marketing costs.

## Production of selected fisheries

The following tables show details of the quantities and values of production of selected fisheries in each State and the Northern Territory in 1970-71 and throughout Australia for the years 1966-67 to 1970-71.

**SELECTED FISHERIES PRODUCTS: PRODUCTION AND GROSS VALUE  
STATES AND NORTHERN TERRITORY 1970-71**

Product	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.	
<b>QUANTITY</b>									
Fish(a)	'000 lb	35,467	31,990	(b)11,361	17,839	12,339	4,276	426	113,697
Crustaceans(c)	"	5,299	1,720	19,567	7,794	24,147	3,552	9,924	72,002
Molluscs (edible)(d)	"	26,579	15,447	4,271	2,747	4,191	7,767	12	61,013
Pearl-shell(e)	ton	..	..	223.0	..	125.8	..	11.0	(f)593.1
<b>GROSS VALUE (\$'000)</b>									
Fish		5,537	3,277	(b)2,180	2,473	1,200	593	80	15,340
Crustaceans		3,526	1,719	7,119	6,077	21,074	3,507	4,164	47,185
Molluscs (edible)		6,266	2,314	397	686	289	1,836	..	11,789
Pearl-shell(e)(g)		..	..	173	..	97	..	6	(f)392

(a) Estimated live weight. (b) Excludes freshwater fish, particulars of which are not available. (c) Gross weight. (d) Gross (in shell) weight. (e) Source: Department of Primary Industry. (f) Includes manufacturing shell produced from pearl culture operations for which State details are not available for publication. (g) Estimated.

**SELECTED FISHERIES PRODUCTS: PRODUCTION, AND GROSS VALUE  
AUSTRALIA, 1966-67 TO 1970-71**

Product	1966-67	1967-68	1968-69	1969-70	1970-71	
<b>QUANTITY</b>						
Fish(a)	'000 lb	98,533	102,603	108,134	121,993	113,697
Crustaceans(b)	"	46,215	54,017	51,158	55,761	72,002
Molluscs (edible)(c)	"	(d)57,527	(e)64,909	(f)42,565	47,671	61,013
Pearl-shell(g)(h)	ton	459.5	494.9	468.3	525.9	593.1
Trochus-shell(g)	"	2.6	1.0	5.8	0.2	25.1
<b>GROSS VALUE (\$'000)</b>						
Fish(i)		12,646	14,179	14,512	15,493	15,340
Crustaceans		24,906	32,755	36,560	34,088	47,185
Molluscs (edible)		(d)6,580	(e)7,859	(f)6,608	8,087	11,789
Pearl-shell(g)(h)		307	271	237	310	392
Trochus-shell(g)		..	..	1	..	4

(a) Estimated live weight. Excludes freshwater fish caught in Queensland. (b) Gross weight. (c) Gross (in shell) weight. (d) Excludes scallops and mussels in Western Australia. (e) Excludes oysters and mussels in Western Australia and oysters in Tasmania. (f) Excludes abalone and oysters in Western Australia. (g) Source: Department of Primary Industry. (h) Includes manufacturing shell produced from pearl culture. (i) Excludes freshwater fish caught in Queensland.



The following tables show details of the production and gross value of the main types of fish, crustaceans, and molluscs caught in each State and the Northern Territory in 1970-71 and throughout Australia for the years 1966-67 to 1970-71.

Fish

FISH: PRODUCTION, BY TYPE, STATES AND NORTHERN TERRITORY, 1970-71  
(’000 lb estimated live weight)

Type	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
Freshwater types—	412	409	n.a.	1,369	..	53	..	(a)2,244
Marine types—								
Tuna . . . . .	(b)8,034	222	71	5,422	1,229	18	..	14,996
Mackerel . . . . .	85	..	1,800	..	99	..	5	1,989
Snoek . . . . .	161	4,999	..	..	..	1,346	..	6,506
Mullet . . . . .	5,814	715	4,125	135	1,365	22	7	12,183
Tailor . . . . .	364	36	696	..	102	..	..	1,199
Bream (including Tar- whine) . . . . .	675	871	480	8	49	1	..	2,084
Australian salmon . . . . .	718	554	..	2,290	3,628	443	..	7,634
Ruff . . . . .	..	47	..	177	1,615	..	..	1,838
Snapper . . . . .	1,642	792	128	784	423	2	..	3,770
Morwong . . . . .	2,119	125	..	..	9	16	..	2,269
Whiting . . . . .	398	664	651	1,884	497	..	3	4,097
Luderick . . . . .	1,299	158	163	..	..	..	..	1,619
Flathead . . . . .	2,968	1,869	147	10	17	152	..	5,162
Shark . . . . .	2,478	6,169	..	4,649	1,034	1,748	21	16,099
Leatherjacket . . . . .	2,022	36	..	..	27	1	..	2,086
Garfish . . . . .	302	432	128	572	60	60	1	1,555
Other . . . . .	5,975	13,892	2,972	538	2,187	415	389	26,368
<i>Total marine</i> . . . . .	<i>35,054</i>	<i>31,580</i>	<i>11,361</i>	<i>16,469</i>	<i>12,339</i>	<i>4,223</i>	<i>426</i>	<i>111,454</i>
<b>Grand total</b> . . . . .	<b>35,467</b>	<b>31,990</b>	<b>(c)11,361</b>	<b>17,839</b>	<b>12,339</b>	<b>4,276</b>	<b>426</b>	<b>113,697</b>

(a) Incomplete; excludes Queensland. (b) Source: C.S.I.R.O. (c) Incomplete; figure for freshwater fish caught in Queensland not available.

GROSS VALUE OF FISH, BY PRINCIPAL TYPES, 1970-71  
(\$’000)

Type of Fish	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
Tuna . . . . .	803	14	4	325	86	1	..	1,234
Snoek . . . . .	57	267	..	..	..	67	..	391
Mullet . . . . .	767	66	410	12	151	3	1	1,410
Australian salmon . . . . .	50	39	..	160	174	34	..	457
Snapper . . . . .	618	230	35	164	68	..	..	1,114
Morwong . . . . .	351	21	..	..	1	2	..	376
Flathead . . . . .	619	293	29	1	2	18	..	962
Shark . . . . .	251	1,326	..	497	150	307	4	2,535
All other species . . . . .	2,021	1,019	(a)1,703	1,312	569	162	74	6,860
<b>Total fish</b> . . . . .	<b>5,537</b>	<b>3,277</b>	<b>(a)2,180</b>	<b>2,473</b>	<b>1,200</b>	<b>593</b>	<b>80</b>	<b>15,340</b>

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

**FISH: PRODUCTION, BY TYPE, AUSTRALIA, 1966-67 TO 1970-71**  
(\*000 lb estimated live weight)

Type	1966-67	1967-68	1968-69	1969-70	1970-71
Freshwater types(a)	1,184	1,082	1,694	1,494	2,244
Marine types—					
Tuna(b)	12,455	14,998	19,657	18,630	14,996
Mackerel	2,153	2,221	1,755	1,682	1,989
Snoek	5,146	7,307	8,587	9,092	6,506
Mullet	12,460	11,719	11,181	11,622	12,183
Tailor	799	1,362	973	1,142	1,199
Bream (including Tarwhine)	1,692	2,065	1,986	2,063	2,084
Australian salmon	14,898	15,658	9,464	10,503	7,634
Ruff	1,636	1,313	1,812	1,907	1,838
Snapper	3,668	3,548	2,908	3,528	3,770
Morwong	3,772	2,980	2,629	1,879	2,269
Whiting	3,619	3,679	3,838	4,564	4,097
Luderick	1,455	1,486	1,410	1,650	1,619
Flathead	5,848	5,370	6,076	6,158	5,162
Shark	13,322	13,281	15,818	17,070	16,099
Leatherjacket	986	854	814	1,679	2,086
Garfish	1,780	1,659	1,904	1,966	1,555
Other	11,660	12,023	15,628	25,365	26,368
Total marine	97,349	101,522	106,440	120,500	111,454
Grand total	98,533	102,603	108,134	121,993	113,697

(a) Excludes freshwater fish caught in Queensland, particulars of which are not available. (b) Includes estimate by C.S.I.R.O. for New South Wales.

**Crustaceans**

**CRUSTACEANS: PRODUCTION, BY TYPE, STATES AND NORTHERN TERRITORY, 1970-71**  
(\*000 lb gross weight)

Type	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
Rock lobster(a)	369	1,718	160	5,105	17,861	3,542	..	28,756
Prawns	4,691	1	18,740	2,675	6,179	..	9,905	42,190
Crabs	239	1	667	14	107	9	19	1,055
Total	5,299	1,720	19,567	7,794	24,147	3,552	9,924	72,002

(a) Includes freshwater crayfish caught in New South Wales and Victoria, bay lobster taken in New South Wales, Queensland and Western Australia and *cherax destructor*, commonly known as yabbies taken in South Australia.

CRUSTACEANS: PRODUCTION, BY TYPE, AUSTRALIA, 1966-67 TO 1970-71  
(<sup>0</sup>000 lb gross weight)

Type	1966-67	1967-68	1968-69	1969-70	1970-71
Rock lobster(a)	(b)31,626	(b)33,107	(b)28,883	(c)25,264	(c)(d)28,756
Prawns	13,624	20,101	21,414	29,467	42,190
Crabs	966	809	860	1,031	1,055
<b>Total</b>	<b>46,215</b>	<b>54,017</b>	<b>51,158</b>	<b>55,761</b>	<b>72,002</b>

(a) Includes freshwater crayfish caught in New South Wales and bay lobster taken in Queensland. (b) Includes also freshwater crayfish caught in Victoria. (c) Includes also freshwater crayfish caught in Victoria and bay lobster taken in New South Wales and Western Australia. (d) Also includes *cherax destructor*, commonly known as yabbies taken in South Australia.

Molluscs (edible)

MOLLUSCS: PRODUCTION, BY TYPE, STATES, 1970-71  
(<sup>0</sup>000 lb gross (in-shell) weight)

Type	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
Octopus	..	53	..	134	1	..	..	189
Squid	..	242	115	(a)78	24	7	..	466
Cuttlefish	..	3	..	(b)	..	..	..	3
Oysters	21,255	2	280	5	2	71	12	21,627
Scallops	3,124	9,590	3,876	..	3,897	..	..	20,488
Pipi	..	..	..	19	..	..	..	19
Mussels	131	1,048	..	85	..	..	..	1,265
Abalone	2,068	4,509	..	2,426	266	7,689	..	16,958
<b>Total</b>	<b>26,579</b>	<b>15,447</b>	<b>4,271</b>	<b>2,747</b>	<b>4,191</b>	<b>7,767</b>	<b>12</b>	<b>61,013</b>

(a) Includes cuttlefish. (b) Included with squid.

MOLLUSCS: PRODUCTION, BY TYPE, AUSTRALIA, 1966-67 TO 1970-71  
(<sup>0</sup>000 lb gross (in-shell) weight)

Type	1966-67	1967-68	1968-69	1969-70	1970-71
Octopus	(a)34	(b)18	(b)26	(b)62	189
Squid	(c)369	(d)377	(d)374	(d)561	(e)466
Cuttlefish(b)	..	1	7	10	3
Oysters	16,115	(f)16,636	(g)16,576	20,633	21,627
Scallops	(g)29,923	28,757	11,049	12,237	20,488
Pipi	..	..	..	..	19
Mussels	(g)260	(g)246	119	670	1,265
Abalone	10,825	18,872	(g)14,415	13,499	16,958
<b>Total(h)</b>	<b>57,527</b>	<b>64,909</b>	<b>42,565</b>	<b>47,671</b>	<b>61,013</b>

(a) Excludes production for Queensland and South Australia, which is included with squid. (b) Production for South Australia is included with squid. (c) Includes octopus for Queensland and cuttlefish and octopus for South Australia. (d) Includes cuttlefish and octopus for South Australia. (e) Includes cuttlefish for South Australia. (f) Excludes particulars for Western Australia and Tasmania which are not available for publication. (g) Excludes particulars for Western Australia which are not available for publication. (h) Incomplete, see relevant footnotes.

## Pearls, pearl-shell and trochus-shell

## PEARL CULTURE OPERATIONS: AUSTRALIA, 1966 TO 1970

(Source: Department of Primary Industry)

		1966	1967	1968	1969	1970
Live shell introduced	No. of shells	697,443	783,733	838,622	796,831	444,727
	tons	345.5	427.6	440.1	404.3	177.0
Production of—						
Cultured pearls—						
Round and baroque pearls	No.	105,121	56,653	76,337	77,858	80,445
	momme(a)	63,073	30,061	42,854	44,334	48,314
	\$'000	2,975	1,539	2,499	3,020	2,029
Half pearls	No.	264,012	266,466	522,247	631,476	472,259
	\$'000	621	680	1,165	1,409	606
Manufacturing shell	tons	160.1	168.2	213.4	261.7	233.4
	\$'000	70	80	86	120	116

(a) A momme is a pearl weight measurement equivalent to 0.13 oz (avoirdupois).

## PEARL-SHELL AND TROCHUS-SHELL: PRODUCTION STATES AND NORTHERN TERRITORY, 1966 TO 1970

(Source: Department of Primary Industry)

(Tons)

	1966	1967	1968	1969	1970
Pearl-shell(a)—					
Queensland	179.6	189.2	137.9	119.5	223.0
Western Australia	103.2	132.7	117.0	137.7	125.8
Northern Territory	16.6	4.8	..	7.0	11.0
<b>Australia</b>	<b>299.4</b>	<b>326.7</b>	<b>254.9</b>	<b>264.2</b>	<b>359.8</b>
Trochus-shell—					
Queensland	2.6	1.0	5.8	0.2	25.1

(a) Excludes manufacturing shell produced from pearl culture operations.

## Whales

## WHALES TAKEN(a): AUSTRALIA, 1967 TO 1971

(Source: Department of Primary Industry)

(Number)

	1967	1968	1969	1970	1971
Male	560	585	637	775	820
Female	27	73	42	24	40
<b>Total</b>	<b>587</b>	<b>658</b>	<b>679</b>	<b>799</b>	<b>860</b>

(a) Sperm whales only were taken.

**Processing of fish, crustaceans and molluscs**

Ice is extensively used for the chilling of fish taken in estuarine and inshore fisheries. Refrigeration is used particularly on vessels operating in the tuna fishery and prawn fisheries to chill or freeze the catch. Refrigerated brine tanks are most commonly used.

Processing plants are located strategically throughout Australia close to fishing grounds. In recent years a number of shore-based plants have been established in remote areas of northern Australia to service the expansion of the prawn fishery. Processing vessels receiving prawns from a fleet of trawlers are also operating in this fishery.

Rock lobsters, prawns and scallops are frozen for export, tuna, snoek, Australian salmon and abalone are canned; small amounts of fish are smoked; some molluscs are bottled. Hand labour is still used extensively in processing operations, but mechanisation is being progressively introduced.

Fish, crustaceans and molluscs intended for export are processed in establishments registered under the Export (Fish) Regulations. Edible fish for local consumption is mainly dispatched fresh iced to markets. A survey of the Australia seafood processing industry was published by the Department of Trade and Industry in 1971.

**FISH PROCESSING (EXCEPT FREEZING): AUSTRALIA, 1966-67 TO 1970-71**  
(<sup>'000 lb</sup>)

	1966-67	1967-68	1968-69	1969-70	1970-71
Fish used(a)—					
Whole . . . . .	18,782	24,146	25,323	24,652	19,195
Headed and or gutted . . . . .	6,872	7,824	5,181	4,952	3,070
<b>Estimated live weight equivalent,</b>					
<b>fish used . . . . .</b>	<b>26,700</b>	<b>33,200</b>	<b>31,300</b>	<b>30,400</b>	<b>23,000</b>
Production(b)—					
Canned fish(c)					
Australian salmon . . . . .	6,344	6,736	4,368	5,555	4,239
Tuna . . . . .	5,639	8,193	8,618	8,111	6,108
Other . . . . .	1,818	2,469	1,894	1,952	1,006
<b>Total canned fish . . . . .</b>	<b>13,801</b>	<b>17,398</b>	<b>14,880</b>	<b>15,619</b>	<b>11,352</b>
Smoked fish . . . . .	241	259	175	238	269
Fish paste . . . . .	1,146	1,310	1,194	1,135	1,260
Fish meal(d) . . . . .	1,805	1,714	2,221	3,989	4,441

(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) Excludes canned rock lobsters, prawns, oysters, and clams, details of which are not available for publication. (c) Includes fish loaf, fish cakes, etc. (d) Excludes whale meat.

**Whale processing**

Oil from sperm whales is used in the manufacture of soap, plastics and watch lubricants, and in automatic transmission systems in motor cars.

**WHALE PROCESSING: AUSTRALIA, 1967 TO 1971**  
(Source: Department of Primary Industry)

		1967	1968	1969	1970	1971
Quantity of sperm whale oil produced	barrels(a)	22,428	23,474	26,142	31,686	36,414
Value of whale oil produced . . . . .	\$'000	423	435	607	1,082	1,390
Value of by-products (meal, meat, solubles, etc.) . . . . .	„	282	313	349	481	553
<b>Total value of products . . . . .</b>	<b>„</b>	<b>705</b>	<b>748</b>	<b>956</b>	<b>1,563</b>	<b>1,943</b>

(a) 6 barrels = 1 ton.

**Domestic marketing of fisheries products**

Although virtually the whole of the tuna and Australian salmon catches and a large proportion of the snoek catch are canned, the greater part of Australian fish production is marketed fresh or frozen.

Marketing arrangements for fresh fish vary. In New South Wales fish marketing is the responsibility of the Fish Marketing 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. In Queensland the Fish Board and North Queensland Fish Board sells all production on behalf of fishermen in that State, except for fish intended for export and interstate trade. In Victoria, Western Australia, South Australia and Tasmania there is no restriction on market outlets. In South Australia the great majority of fishermen are members of the South Australian Fishermen's Co-operative Ltd, which handles the whole of their production. Other outlets for fish products include retail and catering establishments.

**Consumption of edible fisheries 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 following table. For the purpose of compiling this table, an allowance has been made for the non-commercial fish catch.

**FISHERIES PRODUCTS: ESTIMATED SUPPLIES AVAILABLE FOR CONSUMPTION  
AUSTRALIA, 1966-67 TO 1970-71  
(lb edible weight per head per annum)**

	1966-67	1967-68	1968-69	1969-70	1970-71
Fresh or frozen—					
Fish—					
Australian origin(a) . . . . .	3.1	3.0	3.4	3.9	3.6
Imported . . . . .	3.3	3.5	3.8	3.6	4.6
Crustaceans and molluscs . . . . .	1.8	2.1	1.3	1.6	2.1
Cured (including smoked and salted)	0.6	0.7	1.1	0.9	1.0
Canned—					
Australian origin . . . . .	0.9	0.7	1.1	1.3	1.0
Imported . . . . .	2.4	2.2	2.1	2.0	1.9
<b>Total . . . . .</b>	<b>12.1</b>	<b>12.2</b>	<b>12.8</b>	<b>13.1</b>	<b>14.3</b>

(a) Includes an allowance for non-commercial catch of fish; excludes fish exported.

## Overseas trade in fisheries products

## Edible fisheries products

OVERSEAS TRADE IN EDIBLE FISHERIES PRODUCTS: AUSTRALIA  
1968-69 TO 1970-71

	Quantity ('000 lb)			Value (\$'000 f.o.b.)		
	1968-69	1969-70	1970-71	1968-69	1969-70	1970-71
<b>IMPORTS</b>						
Fresh and frozen(a)	52,528	50,270	66,616	13,641	14,274	21,508
Smoked, dried and salted	10,329	6,943	8,390	2,395	2,041	3,128
Potted and concentrated	143	219	214	137	166	210
Canned—						
Herrings	4,429	4,233	5,065	1,136	1,160	1,434
Salmon	10,601	9,857	9,504	6,485	7,387	6,989
Sardines and pilchards	6,101	6,139	5,056	2,411	2,442	2,383
Tuna	278	403	157	100	151	63
Other fish	2,275	2,462	2,646	785	954	1,116
Crustaceans and molluscs	1,841	1,882	1,911	1,474	1,664	1,763
<i>Total canned</i>	25,525	24,976	24,339	12,391	13,758	13,748
Products not elsewhere included	2,886	4,013	4,766	1,930	2,892	3,100
<b>Grand total</b>	..	..	..	<b>30,493</b>	<b>33,131</b>	<b>41,694</b>

## EXPORTS

(Australian produce only; excludes re-exports)

Fresh and frozen(b)—						
Fish	233	970	3,598	88	210	800
Crustaceans and molluscs—						
Rock lobster tails	9,074	8,539	9,822	22,754	19,686	27,333
Prawns	6,383	10,560	14,583	7,405	12,135	16,930
Other	4,130	3,951	4,901	2,916	3,278	4,488
Boiled and frozen crustaceans and molluscs	904	967	730	1,139	1,193	889
Prepared and preserved—						
Fish	348	479	1,212	152	202	545
Crustaceans and molluscs	4,101	3,548	5,054	2,170	1,992	4,546
Products not elsewhere included	125	159	140	275	280	84
<b>Grand total</b>	..	..	..	<b>36,899</b>	<b>38,976</b>	<b>55,615</b>

(a) Excludes frozen smoked, which is included in item Smoked, dried, etc. (b) Excludes frozen smoked, which is included in item Products not elsewhere included.

## Pearls

Pearls valued at \$832,000 were imported into Australia in 1970-71 (\$667,000 from Papua New Guinea and \$139,000 from Japan) compared with imports valued at \$436,000 in 1969-70 (\$201,000 from Japan, \$199,000 from Papua New Guinea).

Cultured pearls exported from Australia in 1970-71 (excluding re-exports) were valued at \$2,107,000 compared with exports valued at \$2,589,000 in 1969-70, the bulk of the exports each year being shipped to Japan. The value of natural pearls exported from Australia in 1970-71 (excluding re-exports) was \$18,000 compared with \$24,000 in 1969-70, the major proportion being shipped to Japan.

**Pearl, etc., shell**

Of the pearl-shell exported in 1970-71, exports valued at \$207,000 were consigned to the Federal Republic of Germany, \$112,000 to Papua New Guinea, \$99,000 to Japan and \$73,000 to Italy.

**OVERSEAS TRADE IN SHELLS: AUSTRALIA, 1968-69 TO 1970-71**

	Quantity ('000 lb)			Value (\$'000 f.o.b.)		
	1968-69	1969-70	1970-71	1968-69	1969-70	1970-71
Imports . . . . .	141	107	185	38	36	58
Exports(a)—						
Pearl-shell . . . . .	1,240	1,479	1,348	456	574	601
Other shell (including trochus) . . . . .	119	215	170	11	17	24
<b>Total exports . . . . .</b>	<b>1,359</b>	<b>1,694</b>	<b>1,518</b>	<b>467</b>	<b>591</b>	<b>625</b>

(a) Australian produce only; excludes re-exports.

**Marine animal oils**

Of the whale oil exported in 1970-71, about 67 per cent was exported to the United Kingdom, the remainder going to the United States of America and the Federal Republic of Germany.

**OVERSEAS TRADE IN MARINE ANIMAL OILS: AUSTRALIA, 1968-69 TO 1970-71**

	Quantity ('000 gal)			Value (\$'000 f.o.b.)		
	1968-69	1969-70	1970-71	1968-69	1969-70	1970-71
Imports—						
Whale oil from—						
Japan . . . . .	703	292	834	390	193	751
Norway . . . . .	2	482	..	1	309	..
South Africa . . . . .	16	43	39	11	37	40
United Kingdom . . . . .	34	23	30	34	25	43
Other countries . . . . .	3	3	..	3	4	..
<b>Total whale oil . . . . .</b>	<b>758</b>	<b>843</b>	<b>903</b>	<b>440</b>	<b>568</b>	<b>834</b>
Cod liver oil . . . . .	83	68	76	74	83	118
Unrefined fish oils . . . . .	110	114	157	63	79	129
Other . . . . .	16	22	5	14	23	9
<b>Total imports . . . . .</b>	<b>967</b>	<b>1,047</b>	<b>1,141</b>	<b>591</b>	<b>753</b>	<b>1,090</b>
Exports(a)—						
Whale oil . . . . .	1,315	997	1,876	502	492	1,405
Other . . . . .	..	1	1	1	1	1
<b>Total exports . . . . .</b>	<b>1,315</b>	<b>998</b>	<b>1,877</b>	<b>503</b>	<b>493</b>	<b>1,406</b>

(a) Australian produce only; excludes re-exports.