

CHAPTER 26

FISHERIES

Further information on subjects dealt with in this chapter is contained in the annual printed bulletin *Non-Rural Primary Industries* and in the annual mimeographed statistical bulletin *Fisheries*, 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 maccoyii*), snoek (*Leionura atum*), mackerel (*Cybium 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 (*Jasus lalandei* and *Panulirus cygnus*) 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 (*Thomus 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

Naturally occurring oysters are harvested in all States, and in New South Wales edible oysters (*Crassostrea commercialis*) are cultured commercially. There is limited culture of other species in Queensland and Tasmania. Despite a serious decline in catches in recent years, the major scallop (*Pecten alba*) fishery is that based on stocks in Port Phillip Bay, Victoria. A fishery based on the scallop (*Amusium balloti*) is developing in Western Australia, and there are also smaller fisheries in Queensland and Tasmania. An important abalone fishery has been developed since 1964 in south-east Australia with South Australia, Tasmania and Victoria providing the bulk of the catches. 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.

Marine flora

Seaweeds of possible commercial value occur in the coastal waters of New South Wales, Tasmania, South Australia, and Western Australia. At Triabunna, Tasmania, a factory is processing seaweed (*Macrocystis pyrifera*) for its alginate content.

General

A map showing Australia's principal ports and localities of the fishery resources under exploitation appears on plate 46, page 890. 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* 1952-1968, 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, 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 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 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 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.

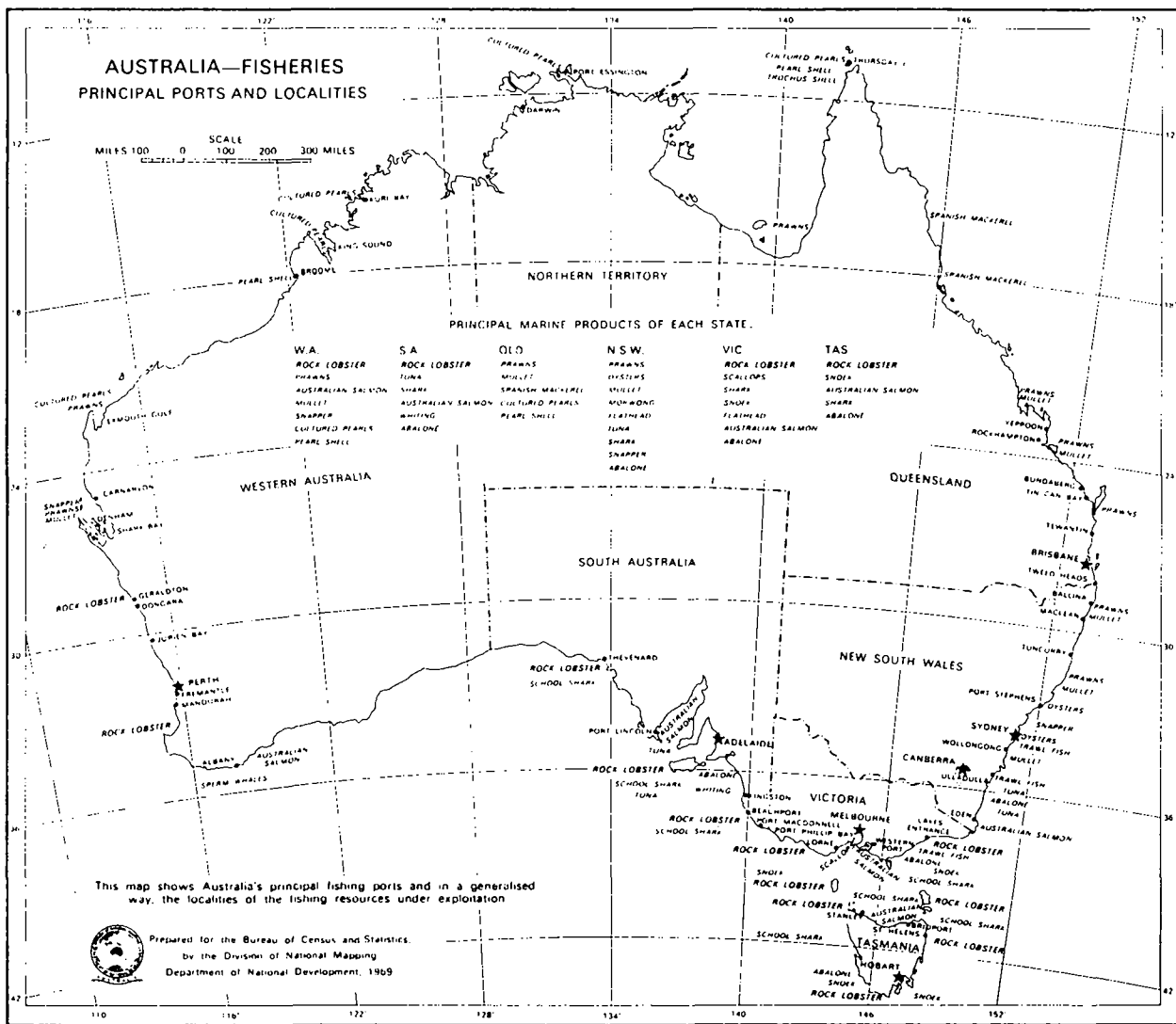
Organisations in Australia at present engaged in research into fisheries matters are:

- (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 Preservation 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 and Sydney; new research vessels have been launched by Victoria and New South Wales; 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



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-States 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 75 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; *fluthead*, Danish seine, otter trawl; *snapper*, long-lines, traps, gill net, hand-line; *morwong*, Danish seine, otter trawl, traps; *whiting*, handlines, Danish seine, beach seine; *garfish*, gill net, 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.

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 around 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, 1968-69**

		<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.	2,345	871	1,349	2,591	1,412	566	110	9,244
Value of boats and equipment	\$'000	8,096	6,410	13,270	10,022	(a)14,603	6,094	5,578	64,072
Edible oyster fisheries—									
Boats employed	No.	1,688	..	100	..	..	n.a.	..	1,788
Value of boats and equipment	\$'000	1,670	..	74	..	..	n.a.	..	1,744
Pearl-shell and trochus-shell, boats employed(b)									
	No.	..	..	18	..	12	..	3	33
Whaling(b)—									
Chasers	No.	..	..	..	..	3	..	..	3
Stations operating	..	..	..	..	..	1	..	..	1

(a) Not comparable with previous years because of changes in methods of valuation. (b) Source: Department of Primary Industry.

**FISHERIES: BOATS AND EQUIPMENT EMPLOYED AND WHALING STATIONS
OPERATING, AUSTRALIA, 1964-65 TO 1968-69**

		<i>1964-65</i>	<i>1965-66</i>	<i>1966-67</i>	<i>1967-68</i>	<i>1968-69</i>
General fisheries—						
Boats employed	No.	9,426	8,983	8,991	9,354	9,244
Value of boats and equipment	\$'000	36,401	40,602	46,102	51,456	(a)64,072
Edible oyster fisheries—						
Boats employed	No.	1,419	1,415	1,549	1,599	1,788
Value of boats and equipment	\$'000	1,125	1,161	1,127	1,444	1,744
Pearl-shell and trochus-shell, boats employed(b)						
	No.	40	42	42	49	33
Whaling(b)—						
Chasers	No.	3	3	3	3	3
Stations operating	..	1	1	1	1	1

(a) See footnote (a) to table above. (b) 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.

REGISTERED COMMERCIAL FISHERMEN: STATES AND NORTHERN TERRITORY
1968-69

Industry	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
General fisheries	3,471	1,571	2,539	4,361	2,785	1,160	573	16,460
Edible oyster fisheries	1,101	..	324	..	n.a.	n.a.	..	1,425
Pearl-shell and trochus-shell(a) . . . . .	..	..	312	..	121	..	40	473
Whaling(a) -								
At sea . . . . .	..	..	..	..	48	..	..	48
Ashore . . . . .	..	..	..	..	32	..	..	32

(a) Source: Department of Primary Industry.

REGISTERED COMMERCIAL FISHERMEN: AUSTRALIA, 1964-65 TO 1968-69

Industry	1964-65	1965-66	1966-67	1967-68	1968-69
General fisheries	11,414	12,256	12,657	14,965	16,460
Edible oyster fisheries	997	1,072	1,249	1,319	1,425
Pearl-shell and trochus-shell(a)	533	544	571	538	473
Whaling(a) -					
At sea	45	44	45	45	48
Ashore	38	42	43	40	32

(a) Source: Department of Primary Industry.

Production, processing and domestic marketing of fisheries products

The tables on pages 893-5 show details of the production of the main types of fish, crustaceans, and molluscs caught in each State and the Northern Territory in 1968-69 and throughout Australia for the years 1964-65 to 1968-69.

Fish

FISH: PRODUCTION, BY TYPE, STATES AND NORTHERN TERRITORY, 1968-69
(’000 lb estimated live weight)

Type	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
Marine types—								
Tuna	(a)11,308	326	63	7,204	714	43	..	19,657
Shark	2,068	6,616	37	4,245	763	2,088	1	15,818
Mullet	6,139	841	2,680	506	1,265	48	5	11,184
Australian salmon	807	943	..	1,755	5,576	383	..	9,464
Snook	138	5,360	..	..	..	3,089	..	8,587
Flathead	3,815	2,024	157	..	17	64	..	6,076
Whiting	325	528	698	1,904	383	..	..	3,838
Snapper	1,261	423	118	793	318	..	1	2,914
Morwong	2,320	291	..	..	..	12	..	2,623
Bream (including Tarwhine)	713	709	378	131	52	..	2	1,986
Garfish	226	510	154	950	37	28	..	1,904
Ruff . . . . .	..	33	..	416	1,363	..	..	1,812
Mackerel	136	..	1,427	..	165	25	2	1,755
Luderick	1,154	96	161	..	..	..	..	1,410
Tailor	282	62	548	..	80	..	..	973
Leatherjacket	763	38	..	..	12	..	..	814
Other	4,836	4,674	2,212	1,044	1,680	292	572	15,312
Total, marine	36,291	23,174	8,633	18,948	12,425	6,072	583	106,127
Freshwater types	248	394	n.a.	1,017	..	36	..	(b)1,694
Grand total	36,539	23,568	8,633	19,965	12,425	6,108	583	107,821

(a) Source: C.S.I.R.O. (b) Incomplete, excludes Queensland.

FISH: PRODUCTION, BY TYPE, AUSTRALIA, 1964-65 TO 1968-69
(*000 lb estimated live weight)

Type	1964-65	1965-66	1966-67	1967-68	1968-69
Marine types—					
Tuna	15,838	(a)18,595	(a)12,455	(a)14,998	(a)19,657
Shark	10,470	11,597	13,322	13,281	15,818
Mullet	12,146	14,152	12,460	11,719	11,184
Australian salmon	8,291	11,184	14,898	15,658	9,464
Snoek	6,514	8,539	5,146	7,307	8,587
Flathead	6,836	5,824	5,848	5,370	6,076
Whiting	3,658	3,600	3,619	3,679	3,838
Snapper	3,877	3,344	3,668	3,548	2,908
Morwong	3,239	3,021	3,772	2,980	2,629
Bream (including Tarwhine)	1,293	1,508	1,692	2,065	1,986
Garfish	1,422	1,471	1,780	1,659	1,904
Ruff	1,507	1,442	1,636	1,313	1,812
Mackerel	2,316	2,298	2,153	2,221	1,755
Luderick	1,356	1,698	1,455	1,486	1,410
Tailor	1,748	1,357	799	1,362	973
Leatherjacket	1,343	1,494	986	854	814
Other	11,381	11,792	11,660	12,023	15,312
<i>Total marine</i>	<i>93,234</i>	<i>102,916</i>	<i>97,349</i>	<i>101,522</i>	<i>106,127</i>
Freshwater types(b)	1,183	1,060	1,184	1,082	1,694
Grand total	94,417	103,976	98,533	102,603	107,821

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

Crustaceans

CRUSTACEANS: PRODUCTION, BY TYPE, STATES AND NORTHERN TERRITORY, 1968-69
(*000 lb gross weight)

Type	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
Rock lobster(a)	455	1,581	144	4,926	18,030	3,747	..	28,883
Prawns	3,602	4	10,031	1,579	3,823	..	2,375	21,414
Crabs	172	..	617	10	61	..	1	860
Total	4,228	1,585	10,792	6,515	21,914	3,747	2,376	51,158

(a) Includes freshwater crayfish caught in New South Wales and Victoria and bay lobster taken in Queensland.

CRUSTACEANS: PRODUCTION, BY TYPE, AUSTRALIA, 1964-65 TO 1968-69
(*000 lb gross weight)

Type	1964-65	1965-66	1966-67	1967-68	1968-69
Rock lobster(a)	26,386	29,908	(b)31,625	(b)33,107	(b)28,883
Prawns	12,076	12,547	13,624	20,100	21,414
Crabs	832	815	966	809	860
Total	39,293	43,270	46,215	54,017	51,158

(a) Includes freshwater crayfish caught in New South Wales and bay lobster taken in Queensland. (b) Includes also freshwater crayfish caught in Victoria.

Molluscs (edible)

MOLLUSCS: PRODUCTION, BY TYPE, STATES, 1968-69
(^{'000} lb gross [in-shell] weight)

Type	N.S.W.	Vic.	Q ^d	S.A.	W.A.	Tas.	N.T.	Aust.
Oysters	16,072	8	453	3	(a)	39	..	16,574
Abalone	496	5,950	..	3,519	(a)	4,648	..	14,614
Scallops . . . . .	..	10,122	620	..	267	276	..	11,285
Squid . . . . .	..	233	89	(b)39	12	..	..	374
Mussels . . . . .	..	119	..	..	..	..	..	119
Octopus . . . . .	..	25	..	(c)	1	..	..	26
Cuttlefish . . . . .	..	7	..	(c)	(a)	..	..	7
Total	16,568	16,463	1,162	3,561	281	4,963	..	42,999

(a) Not available for publication; excluded from Australian total. (b) Includes cuttlefish and octopus. (c) Included with squid.

MOLLUSCS: PRODUCTION, BY TYPE, AUSTRALIA, 1964-65 TO 1968-69
(^{'000} lb gross [in-shell] weight)

Type	1964-65	1965-66	1966-67	1967-68	1968-69
Oysters	14,636	15,067	16,115	(a)16,636	(b)16,574
Abalone	966	2,975	10,825	18,872	(b)14,614
Scallops	(b)24,739	(b)29,524	(b)29,923	28,757	11,285
Squid	217	233	(c)369	(d)377	(d)374
Mussels	334	425	(b)260	(b)246	119
Octopus	13	34	(e)34	(f)18	(f)26
Cuttlefish	1	3	(f)	(f)1	(f)17
Total(g)	40,907	48,262	57,527	64,908	42,999

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

Pearls, pearl-shell and trochus-shell

PEARL CULTURE OPERATIONS: AUSTRALIA, 1964 TO 1968
(Source: Department of Primary Industry)

		1964	1965	1966	1967	1968
Purchases of shell	No. of shells	590,729	635,003	697,443	783,733	838,622
	tons	288.3	311.6	345.5	427.6	440.1
Production of:-						
Cultured pearls—						
Round and baroque pearls	No.	58,839	65,735	105,121	56,653	76,337
	momme(a)	35,892	40,098	63,073	30,061	42,854
	\$'000	2,102	1,760	2,975	1,539	2,499
Half pearls	No.	232,887	278,637	264,012	266,466	522,247
	\$'000	764	883	621	680	1,165
Manufacturing shell	tons	107.9	155.4	160.1	168.2	213.4
	\$'000	38	67	70	80	86

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

FISHERIES

PEARL-SHELL AND TROCHUS-SHELL: PRODUCTION
STATES AND NORTHERN TERRITORY, 1964 TO 1968

(Source: Department of Primary Industry)

(Tons)

	1964	1965	1966	1967	1968
Pearl-shell(a)—					
Queensland	215.4	193.3	179.6	189.2	137.9
Western Australia	79.9	97.4	103.2	132.7	117.0
Northern Territory	5.4	8.9	16.6	4.8	..
<i>Australia</i>	300.7	299.6	299.4	326.7	254.9
Trochus-shell—					
Queensland	30.6	10.8	2.6	1.0	5.8

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

WHALES TAKEN(a): AUSTRALIA, 1965 TO 1969

(Source: Department of Primary Industry)

(Number)

	1965	1966	1967	1968	1969
Male	636	595	560	585	637
Female	32	11	27	73	42
Total	668	606	587	658	679

(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.

Edible fish for local consumption is mainly dispatched fresh iced to markets.

FISH PROCESSING (EXCEPT FREEZING): AUSTRALIA 1964-65 TO 1968-69
(*000 lb)

	1964-65	1965-66	1966-67	1967-68	1968-69
Fish used(a)--					
Whole	16,464	17,030	18,782	24,146	25,292
Headed and or gutted	5,491	5,866	6,872	7,824	5,050
<i>Estimated live weight equivalent, fish used</i>	22,900	23,900	26,700	33,200	31,200
Production(b)					
Canned fish(c)--					
Australian salmon	3,875	4,664	6,344	6,736	4,368
Tuna	5,482	4,839	5,639	8,193	9,033
Other	1,557	2,350	1,818	2,469	1,603
<i>Total, canned fish</i>	10,914	11,853	13,801	17,398	15,004
Smoked fish	222	258	241	259	175
Fish paste	944	1,018	1,146	1,310	1,194
Fish meal(d)	2,373	1,778	1,805	1,714	2,179

(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, 1965 TO 1969

(Source: Department of Primary Industry)

		1965	1966	1967	1968	1969
Quantity of sperm whale oil produced	barrels(a)	25,002	24,252	22,428	23,472	26,922
Value of whale oil produced	\$'000	510	540	423	435	608
Value of by-products (meal, meat, solubles, etc.)	..	244	398	282	313	345
<i>Total value of products</i>	..	754	938	705	748	953

(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 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. 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.

Value of fisheries production

The following tables show details of the values of production of edible fisheries products, pearl-shell and trochus-shell for the years 1964-65 to 1968-69. See also the chapter Miscellaneous for an explanation of the value terms used.

SELECTED FISHERIES PRODUCTS: GROSS VALUE, STATES AND NORTHERN TERRITORY
1968-69
(\$'000)

Product	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
Fish	5,142	2,678	(a)1,881	3,013	922	627	96	14,359
Crustaceans	2,746	1,458	4,197	4,240	19,613	3,474	832	36,560
Molluscs (edible)	3,572	1,715	167	431	(b)26	714	..	6,624
Pearl-shell(c) . . . . .	..	..	(d)61	..	(d)90	..	..	(e)237

(a) Excludes freshwater fish, particulars of which are not available. (b) Excludes abalone, green turtle and oysters, particulars of which are not available for publication. (c) Source: Department of Primary Industry. (d) Estimated. (e) Includes manufacturing shell produced from pearl culture operations; details classified by States are not available for publication.

SELECTED FISHERIES PRODUCTS: GROSS VALUE, AUSTRALIA, 1964-65 TO 1968-69
(\$'000)

Product	1964-65	1965-66	1966-67	1967-68	1968-69
Fish(a)	12,187	13,730	12,646	14,179	14,359
Crustaceans	22,386	24,008	24,906	32,755	36,560
Molluscs (edible)	(b)3,804	(b)4,159	(b)6,580	(b)8,036	(c)6,624
Pearl-shell(d)	271	291	307	271	237
Trochus-shell(d)	5	2	..	..	1

(a) Excludes freshwater fish caught in Queensland. (b) Excludes scallops in Western Australia. (c) Excludes abalone, green turtle and oysters in Western Australia. (d) Source: Department of Primary Industry.

GROSS VALUE OF FISH, BY PRINCIPAL TYPES, 1968-69(a)
(\$'000)

Type of Fish	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
Tuna	1,018	49	3	612	36	4	..	1,722
Shark	166	1,187	2	508	92	332	..	2,287
Mullet	844	45	241	30	132	4	1	1,297
Australian salmon	142	81	..	158	205	29	..	615
Snoek	51	298	..	..	..	159	..	509
Flathead	724	200	28	..	2	7	..	961
Snapper	360	123	32	166	54	..	..	734
Morwong	376	41	..	..	..	2	..	418
All other species	1,461	656	(b)1,574	1,538	401	90	94	5,816
Total fish	5,142	2,678	1,881	3,013	922	627	96	14,359

(a) A breakdown of value according to species is not available for previous years. (b) Excludes freshwater fish, particulars of which are not available.

In the following table the gross value and local value of fishing and whaling production 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.

**FISHERIES: GROSS AND LOCAL VALUE OF PRODUCTION
STATES AND NORTHERN TERRITORY, 1964-65 TO 1968-69**
(\$'000)

<i>Year</i>	<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>
GROSS VALUE								
1964-65	9,830	3,731	5,737	5,120	15,218	2,686	71	42,393
1965-66	10,163	4,403	6,086	6,048	15,733	3,300	61	45,794
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	11,461	5,851	8,089	7,683	23,717	4,864	1,191	62,856
LOCAL VALUE								
1964-65	8,263	3,212	5,298	4,480	15,167	2,194	71	38,685
1965-66	8,555	3,797	5,588	5,294	15,683	2,747	61	41,725
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	9,807	5,265	7,679	6,773	23,600	4,100	1,191	58,415

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 table below. 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, 1964-65 TO 1968-69**
(lb edible weight per head per annum)

	<i>1964-65</i>	<i>1965-66</i>	<i>1966-67</i>	<i>1967-68</i>	<i>1968-69</i>
Fresh or frozen--					
Fish--					
Australian origin(a)	3.2	3.3	3.1	3.0	3.3
Imported	3.0	3.8	3.3	3.5	3.8
Crustaceans and molluscs	1.5	1.5	1.8	2.1	1.7
Cured (including smoked and salted)	0.7	0.9	0.6	0.7	0.8
Canned--					
Australian origin	1.0	1.1	0.9	0.7	0.9
Imported	2.3	2.4	2.4	2.2	2.1
Total	11.7	13.0	12.1	12.2	12.6

(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
1966-67 TO 1968-69

	Quantity ('000 lb)			Value (\$'000 f.o.b.)		
	1966-67	1967-68	1968-69	1966-67	1967-68	1968-69
IMPORTS						
Fresh and frozen(a)	45,597	46,886	52,528	12,456	10,741	13,641
Smoked, dried and salted	7,393	8,975	10,329	1,568	2,018	2,395
Potted and concentrated	323	153	143	198	160	137
Canned—						
Herrings	5,844	4,676	4,429	1,281	1,095	1,136
Salmon	12,785	11,226	10,601	7,705	6,681	6,485
Sardines and pilchards	5,318	6,260	6,101	1,919	2,306	2,411
Tuna	148	258	278	51	93	100
Other fish	2,870	2,241	2,275	747	749	785
Crustaceans and molluscs	1,432	2,085	1,841	1,071	1,764	1,474
<i>Total, canned</i>	28,397	26,746	25,525	12,774	12,688	12,391
Products not elsewhere included	2,542	2,634	2,886	1,693	1,725	1,930
Grand total	..	..	..	28,689	27,332	30,494
EXPORTS						
(Australian produce only; excludes re-exports)						
Fresh and frozen(b)—						
Fish	988	296	233	211	116	88
Crustaceans and molluscs—						
Rock lobster tails	10,266	11,016	9,074	17,172	22,540	22,754
Prawns	2,078	3,290	6,383	2,192	3,476	7,405
Other	3,456	5,648	4,130	1,999	3,740	2,916
Boiled and frozen crustaceans and molluscs	1,727	1,136	904	1,536	1,111	1,139
Prepared and preserved—						
Fish	545	384	348	205	146	152
Crustaceans and molluscs	2,435	4,259	4,101	1,392	2,376	2,170
Products not elsewhere included	155	163	125	141	245	275
Grand total	..	..	..	24,848	33,750	36,899

(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 \$720,000 were imported into Australia in 1968-69 (\$325,000 from Papua and New Guinea, \$314,000 from Japan) compared with imports valued at \$451,000 in 1967-68 (\$405,000 from Japan, \$19,000 from Papua New Guinea).

Cultured pearls exported from Australia in 1968-69 (excluding re-exports) were valued at \$1,981,000 compared with exports valued at \$1,532,000 in 1967-68, the bulk of the exports each year being shipped to Japan. The value of natural pearls exported from Australia in 1968-69 (excluding re-exports) was \$17,000 compared with \$12,000 in 1967-68, the major proportion being shipped to the United Kingdom.

Pearl, etc., shell

Of the pearl-shell exported in 1968-69, exports valued at \$122,000 were consigned to the United States of America, \$98,000 to Papua and New Guinea, \$88,000 to the Federal Republic of Germany and \$73,000 to Japan.

OVERSEAS TRADE IN SHELLS: AUSTRALIA, 1966-67 TO 1968-69

	Quantity ('000 lb)			Value (\$'000 f.o.b.)		
	1966-67	1967-68	1968-69	1966-67	1967-68	1968-69
Imports	68	92	141	32	38	38
Exports(a)—						
Pearl-shell	1,326	1,204	1,240	540	381	456
Other shell (including trochus)	84	79	119	32	15	11
Total exports	1,411	1,283	1,359	572	396	467

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

Marine animal oils

Of the whale oil exported in 1968-69, about 60 per cent was exported to the United Kingdom, the remainder going to the United States of America.

OVERSEAS TRADE IN MARINE ANIMAL OILS: AUSTRALIA, 1966-67 TO 1968-69

	Quantity ('000 gal)			Value (\$'000 f.o.b.)		
	1966-67	1967-68	1968-69	1966-67	1967-68	1968-69
Imports -						
Whale oil from—						
Norway		607	2		433	1
Japan	727	261	703	714	170	390
United Kingdom	104	61	34	135	73	34
Other countries	18	30	19	17	27	14
Total whale oil	849	959	758	866	702	440
Cod liver oil	93	94	83	84	81	74
Unrefined fish oils	61	73	110	54	54	63
Other	7	17	16	22	20	14
Total imports	1,010	1,143	967	1,026	857	591
Exports(a)—						
Whale oil	932	1,532	1,315	466	640	502
Other	2	1		3	1	1
Total exports	934	1,533	1,315	469	641	503

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

