

CHAPTER 14

FORESTRY AND FISHERIES



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FORESTRY

Source of statistics

Statistics relating to forested areas have been compiled by the Forestry Branch, Department of Primary Industry from data supplied by State and Territory Forest Services and by private forestry companies. Statistics of timber and by-products have been compiled from the annual factory collections undertaken by the Statisticians in the several States. Figures of production of gums, resins and tanning barks have been provided by the State forestry authorities. Data of imports and exports of forest products and timber products have been compiled by the Australian Statistician as part of the statistics of overseas trade. The figures shown relate, in general, to years ended 30 June.

Objects of forestry

The main object of forestry authorities is to manage the forests of the country in a manner that will provide maximum benefits, both direct and indirect, for the community. The authorities aim to promote the multiple use concept in management under which forests remain in perpetuity as sources of valuable raw material, areas of natural beauty, sanctuaries for fauna and flora, and areas for scientific investigation and watershed protection. The provision of special protected areas such as forest parks for recreational use and for the conservation of plants and animals is an objective. Forestry also aims at improving existing forests and woodlands by properly controlled harvesting, by protection from such destructive agencies as fire, insects and diseases, and by inducing regeneration. The provision of a partial tree cover on denuded lands where this cover is necessary for protective purposes, and a complete cover when the land is more suited under forest than under other land use, are further aims of forestry.

General account of forests and timbers

The area of land in Australia suitable for the production of commercial timber as the principal objective is very small in comparison with the size of the continent. Productive or potentially productive forests cover 43 million hectares, and of these 99 per cent are natural forests. Thirty-five million hectares of the natural forests are dominated by eucalypts. For a description of the types of timber grown in Australia see Year Book No. 61, Chapter 24.

Extent of forested areas

The total area of forest, 43.8 million hectares, is based on a definition of forest which includes plantations, native forest with an existing or potential mature height of 20 metres or more, and cypress pine forest in commercial use regardless of height. The following tables show classifications of total forest area in Australia by forest type and by ownership. Because areas at State level are subject to frequent change, totals have been rounded.

FOREST AREAS CLASSIFIED BY FOREST TYPE, 30 JUNE 1978

(Source: Forestry Branch, Department of Primary Industry)

('000 hectares)

Forest type	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Rainforest	300	—	1,070	—	3	460	40	—	1,873
Eucalypt—									
Productivity—Class I	1,620	650	210	—	180	460	—	—	3,120
Class II	4,450	4,750	1,380	—	2,910	1,800	—	51	15,341
Class III	8,150	630	3,340	10	70	—	—	—	12,200
Tropical eucalypt and paperbark	—	—	4,080	—	7	—	2,450	—	6,537
Cypress pine	1,600	3	1,680	—	2	—	780	—	4,065
Plantations	177	164	142	92	63	43	4	14	699
Total forest area	16,297	6,197	11,902	102	3,235	2,763	3,274	65	43,835

FOREST AREAS CLASSIFIED BY OWNERSHIP, 30 JUNE 1978

(Source: Forestry Branch, Department of Primary Industry)

('000 hectares)

Ownership	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
State forestry(a)	3,600	2,300	4,100	76	2,000	1,220	310	14	13,620
Other public(b)	7,000	3,100	5,800	10	470	360	2,640	50	19,430
National parks	800	200	600	-	150	180	320	1	2,250
Private(c)	4,900	600	1,400	14	610	1,000	-	-	8,525
Total(d)	16,300	6,200	11,900	100	3,230	2,760	3,270	65	43,825

(a) Publicly owned land, permanently reserved or dedicated primarily to timber production. (b) Publicly owned land, vacant or occupied under lease; not specifically secured for permanent timber production, but on which control of timber rests with the Crown. (c) Privately owned land, and leasehold land, where the Crown has no control over timber rights. (d) State totals may not correspond to those in the preceding table due to rounding.

Plantations

The indigenous forest of Australia does not contain adequate supplies of coniferous timber, and Australia's requirements have had to be met largely by imports. As a result of the planned policy of the forest services and of several private commercial organisations, the area of coniferous plantations, mainly of exotic species, is steadily increasing. It was natural that this aspect of forestry should receive earliest attention in South Australia, as this is the State most poorly endowed with natural forest. South Australia now has a large area of planted conifers, and for some years has been obtaining considerable quantities of timber from these plantations. Production is also increasing in other States, and the thinnings from their plantations are already supplying a significant volume of timber. At 31 March 1978, the total area of coniferous plantations was about 655,000 hectares.

The total production of roundwood from Australia's coniferous plantations is now about 3.0 million cubic metres per annum and is expected to increase substantially during the next decade.

A special article giving a detailed account of the history and development of coniferous plantations and of the characteristics of individual species is included in Year Book No. 59, page 880.

Broadleaved plantations (mainly *Eucalyptus* and *Populus* spp) comprise about 44,000 hectares, a much smaller area than for the coniferous plantations. Plantations of ash eucalypts (including *E. delegatensis* and *E. regnans*) for pulpwood in Victoria, and poplar plantations in the Eastern States make up a substantial proportion of the total broadleaved plantation area. The following tables show total area of plantations in Australia classified by species and by ownership.

PLANTATION AREAS CLASSIFIED BY SPECIES BY PUBLIC OWNERSHIP(a), 31 MARCH 1978

(Source: Forestry Branch, Department of Primary Industry)

(Hectares(b))

Species group	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Coniferous—									
<i>Pinus radiata</i>	114,600	75,200	2,500	69,800	21,200	32,200	-	12,800	328,300
<i>Pinus pinaster</i>	-	-	-	6,000	22,700	-	-	-	28,700
<i>Pinus elliptica</i>	3,900	-	54,700	-	-	-	-	-	58,500
<i>Pinus caribaea</i>	1,000	-	10,500	-	-	-	1,400	-	12,900
<i>Araucaria</i> spp.	1,600	-	38,500	-	-	-	-	-	40,100
Other coniferous spp.	4,600	4,200	4,800	600	200	-	2,500	800	17,800
Total coniferous	125,700	79,400	111,000	76,400	44,100	32,200	3,900	13,600	486,300
Broadleaved—									
<i>Eucalyptus</i> species	8,000	7,400	2,000	900	8,300	-	-	-	26,700
<i>Populus</i> spp.	-	-	-	-	-	-	-	-	-
Other broadleaved spp.	-	200	-	-	-	-	100	-	300
Total broadleaved	8,000	7,600	2,000	900	8,300	-	100	-	27,000
Total	133,700	87,000	113,000	77,300	52,400	32,200	4,000	13,600	513,200

(a) Includes both State forestry and other public. (b) Rounded to nearest 100 hectares.

PLANTATION AREAS CLASSIFIED BY SPECIES BY PRIVATE OWNERSHIP, 31 MARCH 1978

(Source: Forestry Branch, Department of Primary Industry)

(Hectares (a))

Species group	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Coniferous—									
Pinus radiata	26,200	70,200	—	14,800	10,600	9,600	—	—	131,400
Pinus pinaster	—	—	—	—	—	—	—	—	—
Pinus elliotii	—	—	24,900	—	—	—	—	—	24,900
Pinus caribaea	—	—	—	—	—	—	—	—	—
Araucaria spp.	—	—	—	—	—	—	—	—	—
Other coniferous spp.	(b) 8,000	1,300	2,800	—	300	—	—	—	12,400
<i>Total coniferous</i>	<i>34,200</i>	<i>71,500</i>	<i>27,700</i>	<i>14,800</i>	<i>10,900</i>	<i>9,600</i>	—	—	<i>168,700</i>
Broadleaved—									
Eucalyptus species	6,900	5,400	1,200	—	—	1,100	—	—	14,600
Populus spp.	2,100	500	—	—	—	—	—	—	2,600
Other broadleaved spp.	—	—	—	—	—	—	—	—	—
<i>Total broadleaved</i>	<i>9,000</i>	<i>5,900</i>	<i>1,200</i>	—	—	<i>1,100</i>	—	—	<i>17,200</i>
Total	43,200	77,400	28,900	14,800	10,900	10,700	—	—	185,900

(a) Rounded to nearest 100 hectares. (b) Includes pinus elliotii.

Australian Government assistance*Softwood Forestry Development*

Since 1966 the Commonwealth Government has provided loans to the States for the planting and or maintenance of softwood forests, with a view to making Australia self-sufficient in forest products.

Under the *Softwood Forestry Agreements Act 1978* the Commonwealth Government provides assistance to the States during the five year period commencing 1977–78, to cover the cost of maintaining softwood forestry plantations established under the *Softwood Forestry Agreement Acts 1967, 1972 and 1976*. The assistance for the maintenance program is provided by way of loans repayable over 20 years with repayments commencing 15 years after the date of each advance. Depending on State preferences, interest is either capitalised over the deferment period, or paid as it falls due. Because of delays in finalising agreements with the States, no payments were made during 1977–78. By 30 June 1979 agreements had been concluded with all States and payments made during 1978–79 totalled \$7.65 million of which \$3.5 million was in respect of 1977–78 entitlements. It is estimated that payments during 1979–80 will amount to \$6.0 million.

Other Forestry

The Commonwealth Government has agreed to provide financial assistance to Tasmania towards the cost of certain silviculture projects undertaken during the five year period commencing 1978–79. No payments were made in 1978–79 and it is anticipated that assistance, by way of loans on a dollar for dollar matching basis will commence during 1979–80 with a payment of \$272,000. The loans are to be repayable over 40 years commencing 20 years after each advance is made. During the 20 years in which repayments are deferred, interest will be capitalised.

The Commonwealth Government has also decided to provide a further \$100,000 per annum for the final four years of the agreement for the purchase of marginal farm land and of eucalypt plantation establishment thereon.

Forest administration and research**Forestry Branch, Department of Primary Industry**

Following the transfer of research functions of the Forestry and Timber Bureau to the Commonwealth Scientific and Industrial Research Organization, Division of Forest Research in 1975, the remaining functions were subjected to a reorganization which led to the establishment of a Forestry Branch within the Department of Primary Industry. The functions of the Forestry Branch include the formulation of policies on aspects of forestry which concern the Commonwealth Government, to collate and publish statistics relevant to forestry and to the end use of the produce of forests, to service the Australian Forestry Council and attendant bodies and to deal with international organizations on matters predominantly of a forestry nature.

Commonwealth Scientific and Industrial Research Organization (CSIRO)

The Division of Forest Research in the Institute of Biological Resources conducts research on harvesting, forest biology (genetics, seeds, taxonomy, ecology, physiology), silviculture (nutrition and nutrient cycling, hydrology), protection (pathology, fire behaviour and effects, entomology) and forest assessment. The Division maintains close liaison with relevant State authorities and, on occasion, collaborates with private companies. It operates seven regional stations in the States and the Northern Territory.

Within the Institute of Biological Resources (Divisions of Plant Industry, Entomology and Wildlife Research) and Earth Resources (Divisions of Soils, Land Resources Management and Land Use Research) research is undertaken on forestry problems relevant to the disciplines pursued in these Divisions.

Within the Institute of Industrial Technology, the Divisions of Building Research, Chemical Technology and Mechanical Engineering carry out a wide range of investigations relating to tree harvesting, the properties of wood, and the uses of wood and wood products. Research on processing logs and timber, solid and composite wood products, timber engineering and the applications of wood in building is undertaken by the Division of Building Research. The research programs of the Division of Chemical Technology are directed towards developing ways whereby Australia's forest resources can be more effectively utilised. The programs include the technology fibre separation, cellulosic composite materials, lignin technology, the assessment and development of cellulosic resources, fibre properties and problems relating to the pulp and paper industry. Technology for the production of liquid fuels from wood and other plant materials is also being investigated. The Division of Mechanical Engineering undertakes research leading to the design and development of machines for tree harvesting.

The Divisions provide assistance to individuals and industry, provide training and experience for overseas technologists and maintain co-operative aid projects with developing countries.

Forestry in the Territories

The management of forests in the Australian Capital Territory is the responsibility of the Forests Section of the Department of the Capital Territory. Forests in the Northern Territory are under the control of the Northern Territory Parks and Wildlife Commission.

Forestry in the States

The objectives of the State Forest Services are primarily the development of permanent forest reserves in each State and to manage these reserves on a multiple use basis. These uses include timber production, provision of minor forest products, grazing, protection of native flora and fauna, recreation and watershed protection. The powers and functions of the State forestry authorities are laid down under forestry Acts and Regulations, and are limited to public lands, in particular to lands set aside for forestry purposes. The functions include the introduction and implementation of proper measures for management and protection of forest land, harvesting, conversion and marketing of forest products. All State forest services are actively engaged in research programs aimed at improving the growth and yield of forest products and in some cases (New South Wales and Queensland) research aimed at improving the utilization of forest products. All State forestry authorities publish annual reports.

Public land permanently reserved or dedicated primarily for timber production in Australia amounts to 13.6 million hectares. State forestry authorities also have control over the timber on approximately 20 million hectares of crown land not specifically reserved for permanent timber production.

Private forestry

Privately owned land carrying productive or potentially productive native forests constitute an important part of Australia's forest resource. However, with the exception of forested land owned or managed by industrial forestry companies these forests are largely unmanaged for timber production. The area of privately owned coniferous plantations continues to increase. The activities of the industrial forestry companies predominate but the small private tree plantation holdings play an important role in the total supply of timber from these plantations.

Government assisted loan schemes for the establishment of private woodlots exist in New South Wales and Victoria. In Tasmania, a new Division of Private Forestry has been established within the State Forestry Commission with the objective of encouraging private forestry, other State Forest Services provide advice and suitable planting stock for private landowners interested in forestry.

The Australian Forest Development Institute is an active association of private forest growers with chapters covering all States of the Commonwealth.

Forestry education

The Australian National University's (ANU) Department of Forestry in Canberra and the School of Forestry of the University of Melbourne offer undergraduate courses leading to a Bachelor of Science degree in forestry. Universities in all States have facilities for post-graduate studies for forestry graduates. Foresters for the Forests Commission of Victoria are trained at a departmental Forestry School at Creswick, Victoria. Some of the Creswick graduates are sent by the Forest Commission of Victoria to the University of Melbourne for further training. States other than Victoria offer traineeships tenable at the ANU to students selected for university training in forestry. These traineeships support the students and meet their expenses throughout the four year university course. Successful graduates are appointed as forestry officers in the State Forest Services. A limited number of post-graduate forestry scholarships are offered by the Commonwealth Government.

The Australian Forestry Council

The Australian Forestry Council comprises the Ministers responsible for forestry in the six State Governments and the Commonwealth Government.

The Council is intended to provide the means for the mutual exchange between the State and Commonwealth Governments of information and views on forestry. It co-ordinates research into problems affecting the establishment, development, management, and fire protection of all forests, and the utilisation of forest products. It assists in co-ordinating the work of State and Commonwealth Governments and also private enterprise in the development of Australian forestry.

The Council is supported by a Standing Committee consisting of the Assistant Secretary, Forestry Branch, Department of Primary Industry, the heads of each of the six State Forest Services, the Chief of the Division of Forest Research, CSIRO, and the Secretary of the Northern Territory Parks and Wildlife Commission.

Employment in forestry

In the following table details are shown of the number of persons employed by State forestry departments, the Department of the Capital Territory, the Northern Territory Parks and Wildlife Commission, the Forestry Branch, Department of Primary Industry in the relevant States and Territories, and the private sector of the forestry industry at 30 June 1978. The table excludes staff of forestry training establishments.

PERSONS EMPLOYED IN FORESTRY^(a), 30 JUNE 1978

Occupational group	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Professional staff—									
Foresters	215	264	116	55	80	87	12	43	872
Others	79	63	118	39	1	55	—	32	387
Field and other technical staff	124	337	131	65	318	179	49	80	1,283
Clerical staff	380	280	277	138	96	112	8	29	1,320
Labour ^(b)	1,294	1,248	1,249	332	662	580	130	87	5,582
Extraction ^(c)	2,860	48	2,230	165	758	2,175	—	70	8,306
Total	4,952	2,240	4,121	794	1,915	3,188	199	341	17,750

(a) The Forestry and Timber Bureau has provided figures for employment within its own organisation. forest works, etc.

(b) Staff engaged in silvicultural

(c) Staff engaged in felling, carting, etc. Includes direct employees only.

Forest production

FOREST PRODUCTION(a) 1977-78

		N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Production of logs for sawing, peeling, slicing or pulping—										
Broadleaved—										
Eucalypt and related species	'000m ³	2,194	1,387	530	3	1,438	3,534	—	—	9,086
Rain forest species	"	105	—	169	—	—	—	—	—	274
Coniferous—										
Indigenous forest conifers—										
Cypress	"	554	669	176	—	—	—	—	—	3,066
Other	"			56	—	—	8	—	—	
Plantation grown conifers	"			273	935	127	116	—	152	
Total	"	2,853	2,057	1,204	938	1,565	3,658	—	152	12,426
Gross value of forest products(b)										
Logs(c)	\$'000	51,623	35,398	25,497	19,357	19,464	54,939	1	2,816	209,096
Other forest products(d)	"	23,900	3,519	8,402	4,118	8,552	5,707	9	126	54,332
Total	"	75,524	38,917	33,899	23,475	28,016	60,645	10	2,942	263,428
Local value of forest products(e)—										
Total	"	75,484	35,804	21,977	23,457	26,658	53,494	10	2,942	239,827

(a) Excludes some production from private land thought to be relatively small, details of which are not available. (b) Gross production is valued at principal markets. (c) See footnote (c) to the table Forest Production: Australia, below. (d) Includes firewood, sleepers, transomes, girders, bridge timbers, mining timber, poles, piles, charcoal (forest production only), tanning bark, essential oils, eucalyptus leaves, crude rutin. (e) Gross production valued at place of production. See footnote (b) above.

FOREST PRODUCTION(a): AUSTRALIA

		1975-76	1976-77	1977-78
Production of logs for sawing, peeling, slicing or pulping—				
Broadleaved—				
Eucalypt and related species	'000 m ³	8,695	9,245	9,086
Rain forest species	"	255	252	274
Coniferous—				
Indigenous forest conifers—				
Cypress	"	2,705	2,929	3,066
Other	"			
Plantation grown conifers	"			
Total	"	11,655	12,426	12,426
Gross value of forest products(b)—				
Logs(c)	\$'000	167,891	191,246	209,096
Other forest products(d)	"	45,111	52,105	54,332
Total	"	213,002	243,351	263,428
Local value of forest products(e)—				
Total	"	194,796	222,556	239,827

(a) Excludes some production from private land, thought to be relatively small, details of which are not available. (b) See footnote (b) to the table Forest Production, 1977-78, above. (c) Included in this category are amounts attributable to sawmillers who carry out their own logging activities as a secondary part of their operations. As such, the values are attributable to the sawmilling industry which is part of manufacturing industry. However, the amount has been included in this table so that the overall value of forest products might be shown. (d) Includes firewood, sleepers, transomes, girders, bridge timbers, mining timber, poles, piles, charcoal (forest production only), tanning bark, essential oils, eucalyptus leaves, crude rutin. (e) Gross production valued at place of production. See footnote (b) to the table Forest Production, 1977-78 above.

Timber and timber products

The selected details shown below have been compiled from the annual census of manufacturing establishments. For further details see Chapter 17, Manufacturing and Internal Trade.

MANUFACTURING ESTABLISHMENTS^(a)—SUMMARY OF OPERATIONS, 1977-78 (BASED ON 1978 EDITION OF ASIC)

1978 ASIC code(b)	Industry description	Establish- ments at 30 June	Persons employed (c)	Turnover	Value added	Fixed capital expenditure less disposals
		No.	No.	\$'000	\$'000	\$'000
2531	Log sawmilling	774	13,095	367,290	220,974	12,703
2533	Veneers and manufactured boards of wood	74	5,935	232,827	97,589	5,825
2537	Hardboard woodchips	10	666	87,780	33,418	2,185

(a) All manufacturing establishments owned by multi-establishment enterprises and single establishment enterprises; with four or more persons employed. (b) Australian Standard Industrial Classification. (c) Average over whole year includes working proprietors.

TIMBER AND SELECTED TIMBER PRODUCTS PRODUCED^(a)

Item		1975-76	1976-77	1977-78
Undressed sawn timber—				
Recovered from sawn logs—				
Australian grown—				
Broadleaved	'000 cu m	2,372	2,312	2,129
Coniferous	"	856	852	927
Total	"	3,228	3,164	3,056
Woodchips (green weight)—				
Hardwood (broad leaved)	'000 tonnes	2,603	3,623	3,668
Plywood—				
Commercial—(surface measure)	'000 sq m	5,967	6,550	7,290
(1 mm basis)	"	35,221	35,298	38,948
Waterproof—(surface measure)	"	4,643	4,097	3,985
(1 mm basis)	"	35,715	41,219	38,424
Particle board (resin bonded)	'000 cu m	460	496	522
Wood pulp—				
Chemical	tonne	162,342	182,775	189,815
Mechanical	"	392,675	416,905	424,090
Other	"			
Paper—				
Newsprint	tonne	206,228	206,590	207,621
Printings	"	46,510	55,329	69,982
Writing (incl. cartridge)	"	69,943	87,896	82,877
Wrapping	"	301,524	321,571	416,344
Blotting	"			
Duplicating	"	29,381	30,286	40,031
Other paper	"			
Tissue and sanitary papers	"	88,716	91,405	93,586
Paperboard (incl. strawboard)	"	379,942	430,711	415,290

(a) Excludes production of small single establishment enterprises with less than four persons employed and establishments engaged in non-manufacturing activities but which may carry on, in a minor way, some manufacturing.

Woodchips

The woodchip industry entails the procurement of wood and its mechanical reduction to chips about the size of an Australian 50 cent piece. These chips are either exported for pulping or retained for use in domestic pulping operations. In 1977-78 the production of hardwood chips in Australia amounted to 3,668,000 tonnes.

Imports

IMPORTS OF CRUDE WOOD AND TIMBER

		Quantity			Value f.o.b. (\$'000)		
		1976-77	1977-78	1978-79p	1976-77	1977-78	1978-79p
Crude wood, and timber—							
Wood waste and charcoal	'000 cu m	n.a.	n.a.	n.a.	9	8	23
Wood in the rough or roughly squared	"	36	33	24	1,923	2,146	1,670
Wood shaped or simply worked—							
Railway or tramway sleepers	"	—	17	7	—	3,048	1,539
Timber, sawn lengthwise, sliced or peeled, but not further prepared, of a thickness exceeding 5 mm—							
Conifer—							
Douglas fir	"	445	336	374	47,880	42,006	54,259
Hemlock and balsam	"	73	79	88	5,626	6,332	7,636
Radiata pine	"	38	63	29	2,673	2,604	2,445
Redwood	"	8	3	5	1,675	612	1,680
Western red cedar	"	99	86	75	15,418	13,864	18,483
Other	"	24	6	16	(a)2,682	(b)878	(c)2,367
Total conifer	"	687	573	587	75,954	66,296	86,870
Non-conifer	"	352	236	227	(d)44,639	29,813	36,720
Timber (including blocks, strips, etc.), planed, tongued, grooved, rebated, etc., but not further manufactured—							
Conifer	'000 cu m	56	61	93	6,786	8,539	13,771
Non-conifer	"	71	65	66	14,033	13,921	14,923

(a) Includes a value of \$16,000 for which no quantity has been included. (b) Includes a value of \$3,182 for which no quantity has been included. (c) Includes a value of \$15,000 for which no quantity has been included. (d) Includes a value of \$180,000 for which no quantity has been included.

Exports

EXPORTS OF CRUDE WOOD AND TIMBER(a)

		Quantity			Value f.o.b. (\$'000)		
		1976-77	1977-78	1978-79p	1976-77	1977-78	1978-79p
Crude wood, and timber—							
Wood waste and charcoal (including shell and nut charcoal)	'000m ³	n.a.	n.a.	n.a.	7	62	15
Pulpwood	"	—	—	n.a.	—	—	93,588
Wood in the rough or roughly squared	"	2	4	131	115	258	586
Wood, shaped or simply worked—							
Railway or tramway sleepers	"	30	23	34	4,204	3,797	5,569
Timber, sawn lengthwise, sliced or peeled, but not further prepared, of a thickness exceeding 5 mm—							
Conifer	"	—	9	4	42	41	303
Non-conifer—Jarrah	"	2	1	1	317	294	227
Other	"	23	28	41	4,567	4,834	7,664
Timber (including blocks, strips and friezes for parquet or wood block flooring, not assembled), planed, tongued, etc.—							
Conifer	"	—	1	—	36	493	29
Non-conifer	"	1	32	1	228	303	409

(a) Excludes re-exports.

FISHERIES

Collection and presentation of fisheries statistics

Source and basis of statistics

Statistics presented in this section of the 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 by the Australian Bureau of Statistics.

Australian fisheries production statistics 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 for pearl-shell and trochus-shell refer to the actual quantities of dry shell for sale and exclude the weight of the fish.

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 are found in the surface layers of the open ocean; and demersal fisheries, which are located in the bottom layers of the sea. Estuarine fisheries produce considerable quantities of mullet (mainly *Mugil cephalus*), bream (*Acanthopagrus spp*) and, in northern Australia, the highly regarded giant perch (*Lates calcarifer*). Important freshwater fisheries in New South Wales, Victoria and South Australia include those for Murray cod (*Maccullochella spp*), golden perch (*Plectroplites ambiguus*), eels (*Arguilla australis*) and European carp (*Cyprinus carpio*). Trout are farmed in New South Wales, Victoria and Tasmania. Important pelagic fisheries include those for Australian 'salmon' (*Arripis trutta*), southern bluefin tuna (*Thunnus maccoyii*), snoek (*Leionura atun*), spanish mackerel (*Scomberomerus commersoni spp*), and clupeoids (*Sardinops neopilchardus* and *Engraulis australis*). Demersal fisheries include those for snapper (*Chrysophrys auratus*), whiting (*Sillaginidae*) and from tropical waters the so called 'cods' (*Epinephelus*, etc.). Trawl fisheries off New South Wales and Victoria yield species such as flathead (*Neoplatycephalus* and *Trudis spp.*), morwong (*Nemadactylus spp.*), Silver Dory (*Cyttus Australis*) and John Dory (*Zeus faber*). Expansion of trawling onto the continental slope off central New South Wales and in Western Bass Strait has established a fishery for gemfish (*Rexea solandri*). There has been a renewal of interest in the Great Australian Bight, several grounds resulting in the establishment of a joint venture operation employing three large modern freezer trawlers. The valuable fishery for edible school and gummy shark (*Galeorhinus australis* and *Mustelus antarcticus*) in south-eastern Australia declined significantly in the year 1972-73 because of the discovery of a high mercury content in large school shark, but production and prices have since risen as the fishery for gummy sharks has expanded, although production has not attained its former level. 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 established 'industrial fishery' in Australia.

Crustaceans

Prawns (*Penaeus* and *Metapenaes spp*) provide the most valuable fishery in Australia and are taken in estuarine, coastal and offshore waters of all States except Tasmania. The western and southern rock lobsters (*Panulirus longipes cygnus* and *Jasus novaehollandiae*), also a valuable resource, are taken on rocky reefs around the southern half of Australia. Over the last decade, important fisheries have been established in northern Australia and South Australia. Interest in deep water prawn stocks off New South Wales is growing. Bay lobsters (*Thenus spp* and *Ibacus spp*) are taken incidentally to prawn trawling operations. Crabs (*Scylla spp* and *Portunus spp*) are taken mainly in Queensland, New South Wales and Western Australia.

Molluscs (edible)

Naturally-occurring oysters are harvested in all States; in New South Wales and Queensland the Sydney rock oyster (*Crassostrea commercialis*) is cultured commercially. The introduction of the Pacific oyster (*Crassostrea gigas*) to Tasmania and South Australia has provided a limited supply in those States. Following a serious decline in catches in the scallop (*Pecten meridionalis*) fishery based on stocks in Port Phillip Bay, Victoria, new offshore beds were located in southern New South Wales, eastern Victoria, northern Tasmania and south-western Western Australia. However, substantial fluctuations in abundance have resulted in erratic production from year to year. A fishery based on the saucer scallop (*Amusium balloti*) is located off south and central Queensland and there is a small fishery for the same species in Shark Bay, Western Australia. An important abalone (*Haliotis spp*)

fishery has been developed since 1964 in south-east Australia with Tasmania, Victoria and South Australia providing the bulk of the catch. There is also a small abalone fishery in South-west Australia. Mussels (*Mytilus planulatus*) are harvested in Victoria, Western Australia and New South Wales. Other 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 from various localities in the tropical waters of Australia from Broome 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

Since 1955, sperm whale (*Physeter catodon*) were taken in southern waters of Western Australia. However the numbers of shore stations responsible for carrying out processing operations have decreased and late in 1978 the last of these, located at Albany, Western Australia closed.

Fisheries administration and research

The Constitution of the Commonwealth (section 51 (x)) assigns to the Commonwealth Government power to legislate for fisheries in Australian waters beyond territorial limits, the residual power in respect to waters within territorial limits (including inland waters) resting with the States. The Commonwealth Government 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 Government laws regulating the fisheries are the *Fisheries Act* 1952, the *Continental Shelf (Living Natural Resources) Act* 1968 and the *Whaling Act* 1960. Each of these applies in accordance with the Commonwealth Government's fishery power under the Constitution.

Fisheries Act

This Act, as amended in 1978, will establish a 200 mile Australian fishing zone around Australia and its external Territories. It requires Australians and foreigners engaged in commercial fishing and boats used for such fishing to be licensed. As well as giving effect to Australia's sovereign rights over the living resources of the 200 mile zone, the Act, in accordance with International Law, imposes an obligation on Australia to manage the resources so that they are conserved for optimum utilisation by mankind, both now and in the future.

Continental Shelf (Living Natural Resources) Act

This Act implements in Australian law the sovereign rights conferred on Australia by the Convention on the Continental Shelf, Geneva, 1958 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. 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 is 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 its 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 Government 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 and management of the living resources of the Australian Fishing Zone to ensure that they are not endangered by over exploitation; and achievement of the optimum utilisation of the living resources by the Australian fishing industry and foreign interests. Although fishery resources are common property there are restrictions on trawlers greater than 40 metres in southern waters fisheries such as those for rock lobster, abalone, southern bluefin tuna and prawns in northern Australia where the number of boats are controlled, and the rock lobster fisheries where 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 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 type 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 for the development and management of the fisheries and fishing industry which are consistent with the purposes of those Acts. The former was established with the proceeds of the sale of the assets of the Australian Whaling Commission and was replenished from Consolidated Revenue in 1976-77. The latter is a matching fund into which is paid each year an appropriation from Commonwealth Government 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) CSIRO Division of Fisheries and Oceanography, which has its headquarters and main laboratory at Cronulla, N.S.W. and regional laboratories in Perth and Brisbane (fisheries science and oceanography);
- (ii) CSIRO Division of Food Research, conducts research into handling, storage, processing and transportation of fish at its laboratory in Hobart, Tasmania;
- (iii) State fisheries departments (fisheries laboratories have been established in Perth, Hobart, Melbourne, Sydney, Brisbane, Darwin and Cairns; research vessels are operated by New South Wales, Victoria, Western Australia, Tasmania and South Australia;
- (iv) Fisheries Division, Department of Primary Industry, Canberra (economic and management research, fishing technology, extension and education service); and
- (v) private fishing companies (surveys of fisheries resources, research into handling, processing and marketing).

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 40 metres 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.

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; *morrowong*, Danish seine, otter trawl, traps; *whiting*, handlines, Danish seine, beach seine, gill net; *garfish*, beach seine; *mackerel*, trolling lines; *tuna*, pole and live-bait, purse seine, 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; *abalone*, diving using hookah gear; and *pilchards*, *anchovies*, *jack mackerel* and *striped tuna*, purse seine.

Pearls, pearl-shell and trochus-shell

Ketch-rigged luggers about 15 metres long which carry crews of eight to fourteen members are used for pearl-shell fishing in northern Australia.

Boats and equipment employed by industry

The following table shows details of boats and equipment engaged in the taking of fish, crustaceans and edible molluscs, and pearl-shell and trochus-shell; and the number of chasers and stations engaged in whaling operations. Boats engaged in more than one industry are classified to their main activity.

FISHERIES: BOATS AND EQUIPMENT

		1975-76	1976-77	1977-78
General fisheries—				
Boats	No.	9,110	9,515	10,920
Value of boats and equipment	\$'000	225,901	247,502	n.a.
Edible oyster fisheries—				
Boats	No.	(a)1,926	(a)(b)1,747	n.a.
Value of boats and equipment	\$'000	(a)5,607	(a)(b)5,742	n.a.
Pearl-shell and trochus-shell—				
Boats(c)	No.	15	17	17
Whaling(c)—				
Chasers	No.	3	3	3
Stations operating	No.	1	1	1

(a) Incomplete; excludes Queensland and Tasmania. (b) Incomplete; excludes South Australia.
(c) Source: Department of Primary Industry.

Employment in fisheries

Classification of registered commercial fishermen by industry

The following table has been derived mainly from the licensing records of the various State fisheries authorities. 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 EMPLOYED ON FISHING BOATS

Industry	1975-76	1976-77	1977-78
General fisheries(a)	17,037	17,613	n.a.
Edible oyster fisheries	(b)1,390	(b)(c)1,434	n.a.
Pearl-shell and trochus-shell(d)	194	151	156
Whaling(d)—			
At sea	51	51	51

(a) Figures for general fisheries refer to number of persons (including skippers) reported as usually employed on boats. Persons reported as usually employed on more than one boat for a particular year are counted more than once for that year. Includes the number of licenced commercial fishermen in Western Australia. (b) Incomplete: excludes Queensland and Tasmania. (c) Incomplete: excludes South Australia. (d) 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. *Gross value of production* is the value placed on recorded production at the wholesale price realised in the principal markets. In general, the 'principal markets' are the metropolitan markets in each State, although, in cases where commodities are consumed locally or where they become raw material for a secondary industry, these points are presumed to be the principal markets. *Local value* (i.e. gross value of commodities produced at the place of production) is ascertained by deducting marketing costs from the gross value of commodities produced. Marketing costs include freight, cost of containers, commission, and other charges incurred in marketing. Gross and local values of primary commodities produced involve some dupli-

cation as they include certain primary commodities which are consumed as raw materials to produce other primary commodities (e.g. hay consumed by livestock).

FISHERIES: GROSS AND LOCAL VALUE OF PRODUCTION
(**\$'000**)

Year	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
GROSS VALUE								
1972-73	(a)21,165	11,471	(b)13,375	15,759	28,158	5,739	5,068	(b)100,732
1973-74	(a)20,974	10,895	(b)(c)15,196	17,442	30,494	7,014	7,295	(b)(c)109,310
1974-75	(a)24,609	8,686	(b)12,606	(d)14,083	35,130	6,928	5,667	(b)(d)107,709
1975-76	31,599	10,601	(b)(c)17,137	(d)22,474	51,079	8,511	5,188	(b)(c)(d)146,589
1976-77	36,059	16,014	(b)(c)34,955	(d)27,293	69,094	11,662	11,357	(b)(c)(d)206,434
1977-78	39,665	17,977	(b)(c)40,799	(d)23,236	85,869	12,609	10,337	(b)(c)(d)230,492
LOCAL VALUE								
1972-73	16,898	10,646	12,686	13,969	28,000	5,739	5,068	93,004
1973-74	16,568	8,682	14,387	15,433	30,313	7,014	7,295	99,692
1974-75	21,569	6,949	11,732	12,496	34,785	6,928	5,667	100,127
1975-76	25,334	8,481	16,152	20,022	50,870	8,511	5,228	134,598
1976-77	30,352	13,917	33,953	24,300	68,864	11,662	11,357	194,405
1977-78	33,029	16,539	38,749	20,725	85,566	12,609	10,337	217,554

(a) Incomplete; excludes octopus, squid and cuttlefish in New South Wales. (b) Incomplete; excludes oysters in Queensland.
(c) Incomplete; excludes rock lobster in Queensland. (d) Incomplete; excludes oysters in South Australia.

Production of selected fisheries

SELECTED FISHERIES PRODUCTS: PRODUCTION AND GROSS VALUE
1977-78

Product	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.	
QUANTITY									
Fish(a)	tonnes	22,419	9,209	(b)5,697	10,051	10,859	3,105	1,451	(e)62,789
Crustaceans(a)	"	2,827	345	(c)9,035	4,167	14,878	1,193	2,197	(e)34,641
Molluscs (edible)(a)	"	10,187	6,831	(d)2,858	(d)973	1,598	3,068	5	(e)25,517
GROSS VALUE (\$'000)									
Fish		16,731	11,580	(b)6,067	7,329	6,732	2,438	1,900	(e)52,778
Crustaceans		10,382	1,752	(c)31,444	14,412	68,070	5,019	8,159	(e)139,237
Molluscs (edible)		12,552	4,646	(d)1,622	(d)1,495	1,106	5,152	8	(e)26,581

(a) Estimated live weight. (b) Excludes freshwater fish, particulars of which are not available. (c) Incomplete; excludes rock lobster. (d) Incomplete; excludes oysters. (e) Incomplete; see individual States.

SELECTED FISHERIES PRODUCTS: PRODUCTION, AND GROSS VALUE AUSTRALIA

Product	1975-76	1976-77	1977-78
QUANTITY			
Fish(a)(b)			tonnes
Crustaceans(a)			"
Molluscs (edible)(a)			"
Pearl-shell(f)(g)			"
Trochus-shell(f)			"
	54,973	59,111	62,789
	(c)33,173	(c)36,867	(c)34,641
	(d)21,820	(d)22,615	(d)25,517
	291.2	190.2	150.0
	-	-	-
GROSS VALUE (\$'000)			
Fish(b)	35,549	43,891	52,778
Crustaceans	(c)83,685	(c)125,895	(c)139,237
Molluscs (edible)	(d)20,080	(d)27,060	(d)26,581
Pearl-shell(e)(f)	260	182	124
Trochus-shell(e)	-	-	-

(a) Estimated live weight. (b) Excludes freshwater fish caught in Queensland. (c) Excludes rock lobster in Queensland. (d) Incomplete; excludes oysters in Queensland and South Australia. (e) Source: Department of Primary Industry. (f) Excludes manufacturing shell produced from pearl culture operations.

FISH: PRODUCTION, BY PRINCIPAL TYPES

Type	Tonnes estimated live weight			Gross value (\$'000)		
	1975-76	1976-77	1977-78	1975-76	1976-77	1977-78
Tuna(a)	10,674	10,111	12,291	3,244	4,474	5,564
Mackerel	1,289	1,266	1,480	1,128	1,279	1,446
Snook	359	419	386	128	304	166
Mullet	6,255	5,635	5,991	2,791	2,726	3,001
Bream (including Tarwhine)	904	884	834	860	1,044	1,246
Australian salmon	3,510	3,591	3,097	1,020	1,112	1,149
Ruff	895	802	1,205	191	252	406
Snapper	1,842	2,147	2,074	2,669	3,463	3,511
Morwong	1,815	1,608	1,593	1,416	1,380	1,373
Whiting	2,853	2,717	2,164	(b)4,385	(b)4,371	(b)4,726
Flathead	2,117	2,037	1,958	1,584	1,555	1,578
Shark	6,320	362	363	3,820	239	234
Leatherjacket	413	6,795	7,899	261	6,466	8,589
Other	15,726	20,736	21,453	12,091	15,227	19,787
Total	54,973	59,111	62,789	35,589	43,891	52,778

(a) Includes estimates by CSIRO for New South Wales. (b) Value of whiting in Tasmania is not available for publication and has been included in 'Other'.

Crustaceans

CRUSTACEANS: PRODUCTION, BY TYPE
(tonnes live weight)

Type	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
Murray crayfish	(a)113	(a)295	184	(a)131	83	33
Yabbies						
Rock lobster						
Bay lobster	13,005	(b)11,830	12,265	(a)12,865	12,875	14,588
Prawns	16,757	24,491	16,327	19,478	23,084	19,166
Crabs	(a)647	(a)702	712	700	825	854
Total	(c)30,521	(c)37,318	29,488	(c)33,173	(c)36,867	(c)34,641

(a) Excludes Victorian figure, which is not available for publication. (b) Excludes rock lobster in Queensland. (c) Incomplete; see footnotes to figures for individual species.

Molluscs (edible)

MOLLUSCS: PRODUCTION, BY TYPE
(tonnes estimated live weight)

Type	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
Octopus	(a)40	(a)158	{ (b)20	(c)59	78	(c)92
Squid	(a)314			{ (b)212	253	280	343
Cuttlefish	(a)-	(a)1	(b)-	(c)19	(c)19	(c)29
Oysters	(d)9,202	(d)10,479	(c)(d)8,908	(c)(d)10,273	(c)(d)10,793	(c)(d)9,774
Mussels	(a)23	(a)63	1,019	1,123	544	774
Pipi	117	203	193	195	192	141
Scallops	16,953	12,425	6,062	4,642	4,396	9,307
Abalone	6,439	6,032	4,971	5,256	6,313	5,057
Total	(e)33,089	(e)29,362	(e)21,386	(e)21,820	(e)22,615	25,517

(a) Excludes Victorian figure, which is not available for publication. (b) Excludes New South Wales figure which is not available. (c) Excludes South Australia figure, which is not available. (d) Excludes Queensland figure which is not available. (e) Incomplete; see individual species.

Pearls, pearl-shell and trochus-shell

PEARL CULTURE AND PEARL AND TROCHUS SHELL FISHING OPERATIONS(a)

(Source: Department of Primary Industry)

		1975	1976	1977
QUANTITY				
Pearl and Trochus shell fishing operations—				
Production of—				
Pearl shell(b)	tonne	291.2	190.2	150.0
Trochus shell	tonne	—	—	—
Pearl culture operations—				
Live shell introduced	No.	578,437	464,327	495,465
	tonne	201.2	116.9	157.5
Production—				
Round and baroque pearls	No.	57,638	82,275	71,384
	momme(c)	42,334	64,173	48,056
Half pearls	No.	229,655	302,264	287,283
Manufacturing shell	tonne	105.2	82.4	244.0
VALUE (\$'000)				
Pearl and Trochus shell fishing operations—				
Production of—				
Pearl shell		260	182	124
Trochus shell		—	—	—
Pearl culture operations—				
Production of—				
Round and baroque pearls		7,641	5,752	8,853
Half pearls		392	1,063	1,197
Manufacturing shell		49	48	156

(a) Figures refer to the year ended January for the Northern Territory and Queensland and to the year ended December for Western Australia. (b) Excludes manufacturing shell produced from pearl culture operations. (c) A momme is a pearl weight measurement equivalent to 3.769 grams.

Processing of fish, crustaceans and molluscs

Processing plants are located strategically throughout Australia close to fishing grounds. A number of shore-based plants have been established in remote areas of northern Australia to service the expansion of the northern prawn fishery.

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

Ice is used extensively 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.

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.

Whale processing

WHALING

(Source: Department of Primary Industry)

		1976	1977	1978
Whales taken (a)—				
Male	No.	650	508	508
Females	„	345	116	171
Total	„	995	624	679
Quantity of sperm whale oil produced (b)	barrels	35,190	23,586	n.a.
Value of whale oil produced	\$'000	2,240	2,268	n.a.
Value of by-products (meal, meat, solubles, etc.)	„	751	647	n.a.
Total value of products	„	2,991	2,915	n.a.

(a) Sperm whales only were taken. (b) 6 barrels = approximately 1.016 tonnes.

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

Domestic marketing of fisheries products

Although virtually the whole of the tuna and Australian salmon catches 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 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 sells all production on behalf of fishermen in that State, except fish intended for export and interstate trade. In Victoria, South Australia, Western Australia and Tasmania, there is no restriction on market outlets. In Victoria, South Australia and Western Australia, most fish is sent to metropolitan wholesale fish markets for auctioning; small quantities are processed for sale locally, chiefly by co-operatives. Nearly all fresh fish in Tasmania is consigned direct to processors. The principal outlets for fish products in Australia are retail and catering establishments.

Consumption of edible fisheries products

Particulars of the apparent consumption of fish, crustaceans and molluscs per head of population are included in the following table. For the purposes of estimating supplies of fish available for consumption, an allowance of 10 per cent of commercial production has been made for the non-commercial catch of fish. No such allowances have been made for crustacea or molluscs as it is considered that the non-commercial take is not significant.

FISHERIES PRODUCTS: APPARENT CONSUMPTION
(Kg edible weight per person per annum)

	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78p
Fresh or frozen (edible weight)—						
Fish—						
Australian	1.7	2.0	1.3	1.5	1.5	1.5
Imported	1.4	1.8	1.6	1.6	1.6	1.7
Crustacea and molluscs	0.8	1.2	0.7	1.0	0.9	0.9
Seafood otherwise prepared (product weight)—						
Australian	0.3	0.4	0.7	0.7	0.5	0.5
Imported						
Fish	1.8	2.4	2.1	1.8	2.5	1.9
Crustacea and molluscs . . . . .							0.4
Total seafood	6.2	7.7	6.4	6.6	7.0	6.9

Overseas trade in fisheries products.

Edible fisheries products

OVERSEAS TRADE IN EDIBLE FISHERIES PRODUCTS

	Quantity (tonnes)			Value f.o.b. (\$'000)		
	1976-77	1977-78	1978-79p	1976-77	1977-78	1978-79p
IMPORTS						
Fresh, chilled, frozen or boiled (a)	22,033	22,553	24,397	33,718	36,337	46,946
Smoked, dried, salted or in brine . . .	5,257	3,267	4,715	8,933	7,823	10,413
Potted or concentrated	160	141	128	762	862	877
Canned—						
Herrings	1,594	1,178	1,048	1,929	1,966	2,093
Salmon	5,980	6,726	4,015	19,498	22,203	13,812
Sardines, sild, brisling, etc.	2,333	3,244	2,559	4,475	7,382	6,383
Tuna	655	1,529	1,520	1,399	3,507	3,013
Other fish	1,564	1,991	1,491	2,480	3,106	2,442
Crustaceans and molluscs	2,048	2,257	1,929	5,579	7,021	7,422
<i>Total canned</i>	<i>14,174</i>	<i>16,925</i>	<i>12,562</i>	<i>35,360</i>	<i>45,185</i>	<i>35,165</i>
Other prepared or preserved fish, crustaceans and molluscs	14,823	12,132	10,946	29,785	28,508	31,122
Grand total . . . . .	..	..	..	108,558	118,715	124,523
EXPORTS						
(Australian produce only; excludes re-exports)						
Fresh, chilled or frozen (b)—						
Fish	5,568	4,692	3,390	4,092	2,693	4,045
Crustaceans and molluscs—						
Rock lobster tails	4,982	4,604	4,649	56,580	55,728	56,763
Prawns	7,759	7,489	9,327	52,843	57,217	92,215
Other	1,457	2,636	3,199	6,703	12,283	(c)17,621
Crustaceans and molluscs boiled in water	220	857	1,731	1,418	6,199	13,152
Prepared and preserved—						
Fish	188	65	191	417	280	696
Crustaceans and molluscs	1,870	1,485	1,322	12,959	8,671	8,563
Grand total . . . . .	..	..	..	135,012	143,071	193,055

(a) Excludes frozen smoked, which is included in item 'Smoked, dried, etc.' (b) Excludes frozen smoked, which is included in item 'Prepared and preserved crustaceans and molluscs'. (c) Total value for this item for 1978-79 includes value of \$96,000 for which no quantity has been included.

Non-edible fisheries products

OVERSEAS TRADE IN SELECTED NON-EDIBLE FISHERIES PRODUCTS

		Quantity			Value f.o.b.(\$'000)		
		1976-77	1977-78	1978-79p	1976-77	1977-78	1978-79p
IMPORTS							
Fish heads, fresh or frozen	tonnes	1,631	1,482	1,081	352	341	318
Other fish waste	"	2,344	497	466	384	105	46
Fish, live(a)	'000	11,204	11,546	9,194	1,350	1,432	1,221
Fish meal	tonnes	7,629	2,762	6,354	1,956	1,109	1,520
Whale oil	'000 litres	8	10	(b)98	8	24	104
Cod-liver oil	"	180	170	185	102	123	146
Other oils (including seal oil)	"	123	542	600	275	386	455
Coral and shells and their waste	tonnes	85	102	157	112	145	190
Tortoise shell (including turtle shell, claws, waste)	"	1	-	-	11	5	-
Pearls		n.a.	n.a.	n.a.	578	1,169	870
Total		..	..	..	5,128	4,839	4,870
EXPORTS							
(Australian produce only; excludes re-exports)							
Australian produce—							
Whale oil	'000 litres	6,247	5,219	4,826	2,153	2,399	1,403
Other oils	"	60	67	2	42	69	509
Pearl-shell	tonnes	385	482	307	327	644	511
Other shell (including trochus)	"	512	1,591	955	355	510	776
Natural pearls		n.a.	n.a.	n.a.	4	63	25
Cultured pearls—							
Round	No.	77,703	95,319	100,290	4,240	4,774	16,090
Half round	"	352,440	264,415	347,984	1,398	1,261	1,135
Other		n.a.	n.a.	n.a.	569	902	1,758
Total		..	..	..	9,088	10,621	22,207

(a) Live fish whether or not fit for human consumption. (b) Tonne.

Further information on subjects relating to fisheries is contained in the annual statistical publications *Fisheries, Australia* (7602.0 and 7603.0).