

# Seafood Facts 1

## Seafood for the consumer

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## Seafood and Nutrition

### Healthy Lifestyle

Australians are becoming increasingly aware that a nutritious diet and regular exercise are vital factors in a healthy lifestyle. It is highly recommended to include seafood in your diet twice a week. The steadily growing consumption of seafood is attributed to the following factors.

#### Seafood is low in fat, kilojoules and cholesterol

- Seafood averages 3% fat, an extremely low level. This is lower than meat and dairy products.
- Even Prawns, often given the thumbs down, have almost no saturated fat.
- Eating fish can help lower cholesterol and reduce the risk of heart disease.

#### Seafood is high in protein, vitamins and minerals

- Seafood is an excellent source protein and the easiest source of protein to digest.
- It compares favourably with other meats and dairy products.
- It is also an excellent source of vitamins (especially the B group) and minerals including iodine, zinc, potassium and phosphorus.

### THE "OMEGA FACTOR"

The small amount of fat that is found in seafood is rich in polyunsaturated Omega 3 fatty acids. And this is why seafood is often referred to as 'heart food'

#### Types of Omega 3 fats

- The two major Omega 3 fats are eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA).
- Both are found in fish, along with some Omega 6 fats. These are made from the phytoplankton and algae that the fish eat.
- Fish from colder waters tend to have more EPA, whilst those from slightly warmer waters have more DHA.

#### Omega 3 and cholesterol

- Omega 3 fats can prevent the body making too much of its own LDL (low density lipoproteins) cholesterol.
- Since diabetics have a greatly increased risk of heart disease, increased seafood consumption is strongly recommended.

#### Omega 3 and blood pressure

Several studies have shown that Omega 3 fats lower blood pressure. This probably involves an increase in the prostacyclin / thromboxan activity ratio which favours dilation of blood vessels and reduces resistance to blood flow in veins.

#### Other roles for Omega 3 fats

- Research is underway on the role of Omega 3's within the membrane of cells, their role in cancer, visual acuity, development of the brain and Alzheimer's disease.

#### Omega 3 and cancer

- Current research is also showing that Omega 3 and Omega 6 fats may give protection against cancers by stopping the action of free radicals, which damage tissues.

#### Omega 3 and arthritis

- Studies have now shown reduced joint stiffness and pain from rheumatoid arthritis in those given Omega 3 fats. The benefits also occur with olive oil (an Omega 9 fat) and are apparent after 12 weeks. Research is continuing.

#### Fresh oily fish and asthma

A study by the Institute of Respiratory Medicine, Sydney, found that consumption of fresh, oily fish was associated with a significantly reduced risk of current asthma in children. Researchers believe that omega 3 fats present in seafood may be responsible for the potential to reduce the production of chemicals important in causing inflammation in the lungs of asthmatics.



This information was provided by Fish Line  
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# How to buy, store and handle seafood

## Points for Purchasing Fresh Seafood

### Whole Fish

- lustrous and bright colour, not dull
- pleasant fresh smell
- bright gills
- firm flesh, springs back when touched

### Shellfish

- no discolouration, particularly at joints
- shells should be tightly closed
- good lustrous colour
- pleasant fresh smell

### Filletts and Cutlets

- shiny and firm, not dull and soft
- no 'oozing' of water when touched
- no discolouration
- good shape
- pleasant fresh smell

## Points for Storage of Fresh Seafood

### Whole fish

- scale and remove gills and gut
- wash in cold water and dry well
- wrap in foil or place in covered container and keep in refrigerator
- store in refrigerator
- use within 2 - 3 days

### Filletts and Cutlets

- wrap in plastic, foil or place in covered container
- store in refrigerator
- use within 2 - 3 days

### Shellfish

- wrap in plastic, foil or place in covered container

### Molluscs

- use within 2 - 3 days
- live mussels, oysters, pipis and cockles will die if placed in refrigerator - keep these in a dry bag in a cool, dark place such as the laundry,
- use within 3 days - discard any that open prior to cooking

## Points for Storage of Frozen Seafood

### Ensure your freezer operates at -18°C

### Freezing Fish

- whole fish should be gilled and gutted
- wrap each whole fish, fillet or cutlet in plastic
- label, date and freeze
- when frozen, dip in cold water and return to freezer, this forms a protective ice glaze
- fish can be kept frozen for 4-6 months
- oily fish can be frozen for 3 months

### Freezing Shellfish

#### Prawns

- place in plastic container eg. ice cream container, cover with water, seal and freeze - forming a large ice block wrap each whole fish, fillet or cutlet in plastic

#### Shellfish

- keep shell intact, wrap individually in plastic - can ice glaze as for fish fillets

### Freezing Molluscs Squid/Octopus

- remove gut and skin, clean and rinse well - wrap in plastic

### Oysters

- once opened can be placed on tray and a few drops of water with lemon juice sprinkled on top, this acts as an insulator - use within 6 weeks

# Seafood facts 2

## Fisheries Management

### The Australian Fishing Zone and its Resources

The Australian Fishing Zone (AFZ) covers an area of about nine million square kilometres and is third largest in the world after those of France (because of its external territories) and the USA. The AFZ extends 200 nautical miles from the shore and as shown on the map below, also encompasses waters surrounding the offshore territories of the Cocos, Christmas, Norfolk, Macquarie, Heard and McDonald Islands.

Waters fished in the AFZ comprise many different habitats, including inland rivers and farm dams, mangrove-lined creeks and estuaries, shallow coastal bays, coral reefs, the continental shelf and continental slope to over 1.5km in depth.

Because of its geographical isolation from other continents and its wide range of habitat types, one of the most diverse marine faunas in the world has evolved in Australia's waters. However, by world standards, Australian inland waters have comparatively few freshwater fish species.

Despite this species diversity and Australia having the third largest fishing zone in the world, Australia's commercial domestic catch tonnage is generally ranked just outside the top 50 catching countries. This is principally because Australia's fisheries resources are not as abundant or productive as those in many other parts of the world because, on average, Australian waters are low in nutrients due to little run off from the dry Australian continent, a narrow continental shelf, the predominantly southwards flow of the main Australian coastal currents and the lack of permanent upwellings.



### Jurisdictional Responsibility for Fisheries

Jurisdictional responsibility for fisheries in Australia is shared between the Commonwealth, State and Territory Governments. Prior to agreements under the Offshore Constitutional Settlement (OCS) fisheries inside 3 nautical miles from the coast were generally managed by the respective State or Territory and fisheries between 3 nm and 200 nautical miles (i.e. the edge of the AFZ) were generally managed by the Commonwealth.

Under OCS the Commonwealth and State and Territory Governments agree on fisheries jurisdictions that are most appropriate for fisheries in the AFZ taking into account the geographical distribution of specific species and traditional fishing practices, for example:

- highly migratory species and fisheries that straddle State borders are generally managed under Commonwealth law;
- species predominately adjacent to a State or Territory are managed generally under the respective laws of that State or Territory
- fisheries or species which do not fall clearly under (a) or (b) may be managed by a Joint Authority, comprising the Commonwealth Minister and one or more State Ministers responsible for fisheries.
- under any OCS Arrangement, the Commonwealth retains jurisdiction over foreign fishing activities.

## Day-to-Day Management of Fisheries

Day-to-day management of Commonwealth fisheries is undertaken by the Australian Fisheries Management Authority, (AFMA) a statutory authority established under the Fisheries Administration Act 1991 and responsible to an expertise-based Board. AFMA is funded jointly by industry and the Commonwealth Government, recognising both the private and public benefits of fisheries management and the Commonwealth's broader national and international responsibilities. The role of the Minister and the Department is to provide the necessary policy and infrastructure support to AFMA. Day-to-day fisheries management responsibility for fisheries under the jurisdiction a State or Territory is the responsibility of a government fisheries agency reporting to the Minister for fisheries in the relevant jurisdiction. While some States have a separate fisheries portfolio, fisheries agencies in most States are under the umbrella of a larger portfolio such as Primary Industries.

### Fisheries management approaches

The approach to fisheries management in all jurisdictions have similar objectives such as providing ecologically sustainable development, including conservation of biological diversity, habitat protection, and fair and equitable resource sharing. To achieve these broad objectives they undertake a wide range of activities including:

- Develop policy on fisheries resource management, habitat protection and industry development
- Promote and undertake research, development and extension on fisheries resources and aquaculture and seafood technology and markets
- Manage fisheries resources and habitats
- Manage the licensing of fishing and aquaculture activities
- Undertake community education and liaison regarding fisheries
- Monitor and assess fishing activity and fish stocks
- Undertake the compliance of fisheries legislation
- Provide support for fish stocking

- Undertake stakeholder and community consultation processes through advisory committees
- Devise and implement fisheries regulations as management techniques

Fisheries are managed using a variety of techniques including:

- restrictions on the size, type and style of gear used such as limits on the number of hooks or pots, mesh size of nets
- limiting the catch by imposing a total allowable catch (TAC) for certain species (bag limit)
- shell quotas (in the pearling industry)
- minimum and maximum size limits and non take of breeding animals
- seasonal closures
- area closures
- limiting the number of licences in specified fisheries
- restrictions on boat sizes

### Fishing licences

Licences are required by all commercial fishing operations. Licence holders are also required to complete log books providing information regarding catch data and fishing effort.

There is an increasing use of licensing recreational fishing effort which serves the purpose of monitoring recreational fishing activities and raising revenue to contribute to the cost of fisheries management.

**For more information about fisheries management or R&D contact your state or territory fisheries department**

#### Information sources:

Kailola, P.J., Williams, M. I, Stewart, P.C., Reichelt, RL, McNee, A and Grieve, C. (1993). Australian Fisheries Resources. Bureau of Resource Sciences and the Fisheries Research and Development Corporation, Canberra.

AFFA, AFMA and State and Territory fisheries departments

*ESD is using, conserving and enhancing the community's resources such as fish, trees, etc., so that the ecological processes on which life depends are maintained, and the quality of life, now and in the future, can be increased.*

# Seafood facts 4 Fishing methods

## Issue

The main methods used to catch fish by the Australian fishing industry have not changed much since the early 1960s. But, refinements to fishing gear and more sophisticated navigation equipment have made it progressively easier for operators to locate and catch fish. Fishing methods and gear are important factors in determining the level of effort and the effect of fishing on the fish stocks. The level of effort along with the level of catch is used by fisheries scientists as an indicator of the status of the fishery, that is, whether a fishery is fully, over or under fished. This information is then used by the fishery managers to decide the levels of catch, or effort and gear restrictions that are best to maintain the fish stocks and the industry. There is also a strong trend towards adopting fishing methods and gear changes that will reduce or avoid unwanted catch (i.e. bycatch) and that are more environmentally friendly.

## Which gear?

The methods and gear used to catch fish and other seafood vary. Which ones are used depends on the particular habitat in which the fish or other seafood lives and the behaviour of the species targeted by the fishing operator. Some fish, such as tunas, are sea surface feeders; these are called *pelagics* and they are captured with gear that fishes near the surface of the sea. Fish that live and feed near the seabed, such

as flathead, are called *demersals* and they are captured with gear that fishes near or on the seabed. Some species form large aggregations or schools and these are best captured by large trawl or surrounding nets, or long lines with many hooks. Other species are taken individually and these are best captured by traps or lines set over a large area, or by diving.

Fishing boats are often categorised by the fishing gear used on them. For example, fishing boats such as trawlers tow large nets behind them, and longliners set long lengths of line with many hooks attached. Many boats in the Australian commercial fleets are dual purpose and can be rigged with different gear so that they can operate in several fisheries. For example, some can use prawn trawling gear and fish trawling gear. Australia has about 10 000 commercial fishing vessels, many of which are dual purpose.

Various storage methods are used to preserve the fish that are caught. For example, on some larger boats, freezers are used to store and preserve the catch, and such facilities enable them to stay at sea for long periods. Smaller vessels use ice, or very cold brine (i.e. refrigerated seawater). These vessels can generally only stay at sea for about a week.

Fishing methods and gear often have restrictions on them that are imposed by management to help maintain the stocks. For example, mesh sizes or net lengths and number of hooks per line may be limited.

Table: Methods of Fishing Used for Different Target Species

Target Species	Method of Fishing (examples of fish targeted)
Shark	- gillnets (school, gummy & tropical sharks) - longlines & hooks (mainly school & tropical sharks)
Fish - demersal - pelagic	- trawl nets (redfish, flathead, orange roughy) - Danish seine (redfish, flathead) - dropline (hevala) - purse seine nets (pilchards, jack mackerel, skipjack tuna) - longlines (southern bluefin, yellowfin, & bigeye tunas)
Crustaceans	- pots (lobster) - trawls (prawns)
Molluscs	- diving (pearls, abalone, tropical lobsters) - jigging (squid) - trawl/dredge (scallops)

## Methods of catching fish

There are three main methods of catching fish and other seafood in Australian waters:

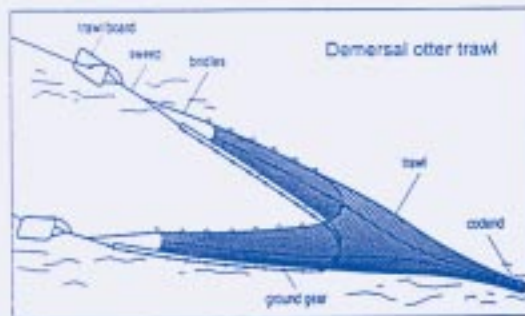
- 1) nets;
- 2) lines and hooks; and
- 3) traps.

These methods are described further below. Other commercial fishing methods include diving (e.g. for abalone, pearl shell, sea urchin, lobster), dredging (e.g. for scallops, mussels) and electrofishing in lakes and rivers (e.g. for carp or eels).

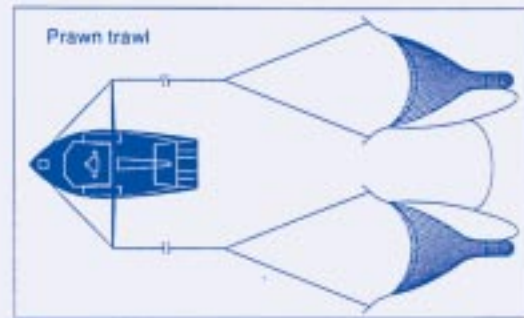
### Nets

Nets are responsible for the largest share of Australia's commercial fish catch and they come in a wide variety of shapes.

- **Trawl nets.** Trawling is the most widely used commercial fishing method in Australia. It can be performed in depths ranging from a few metres to about 1500 metres. Trawl nets may be towed for a period of minutes to several hours. Different types of trawl nets are used to capture different species. For example, **demersal otter trawls** target fish and work the seabed in waters off south-eastern and northern Australia. Species taken in the southern fisheries include orange roughy, gemfish, blue grenadier, flathead and redfish. In northern Australia, species taken include sea perch, red emperor, rock cod and squid. Demersal otter trawls are operated with the trawl boards, sweeps, lower bridge and ground gear in contact with the seabed. The ground gear is weighed down by large rubber or steel bobbins that are attached to the footrope. The net is held open horizontally by the trawl boards being dragged along the seabed; this spreads the sweeps, bridges and net wings. The mouth of the net is held open vertically by a series of floats positioned along the headline. The fish swim ahead of the net until they tire and fall back into the tapered bag where they are retained in the codend. The net is then hauled and the fish are emptied on deck from the codend.



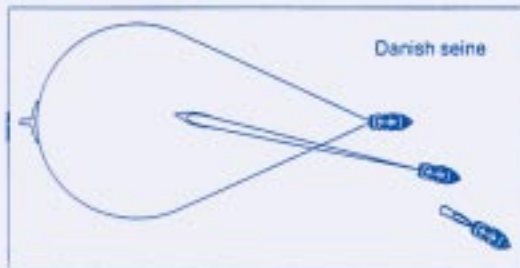
- **Demersal otter trawling for prawns** takes place in all Australian States except Victoria and Tasmania. Tiger, banana, king and endeavour prawns are the main species caught. The gear used is generally smaller than that used for demersal fish trawling. The netting has a smaller mesh size and the vertical net opening is created by the height of the trawl board. The operation of this style of trawling is very similar to fish trawling. Prawn trawlers often fish two or three nets at once.



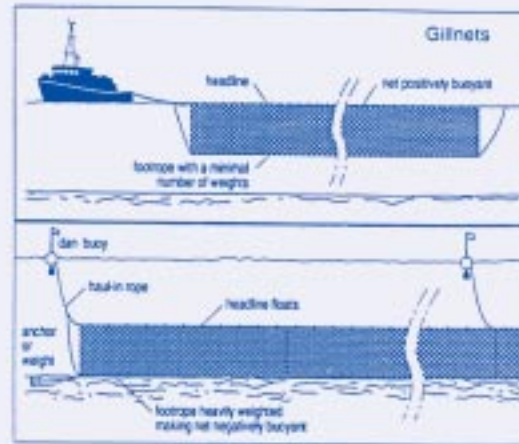
- **Mid-water trawling:** (also called pelagic trawling) has been trialed off south-eastern Australia to target jack mackerel in depths of less than 200 metres and blue grenadier in deeper waters outside the continental shelf. Foreign trawlers from Japan and the former USSR are licensed to operate in Australia's Antarctic Territory with mid-water trawls to catch krill and Antarctic fish.
- **Surrounding nets.** These nets take advantage of the schooling behaviour of fish. They work by enclosing schools of fish within walls of netting and can be operated from the shore (e.g. beach seining) or from a boat (purse seining). The nets usually have two long wings and a section in which the catch is concentrated and retained. Surrounding nets can be positively buoyant (set at the sea's surface) or negatively buoyant (operated on the sea floor).
- **Purse seine.** These nets are operated at the sea's surface. They are mostly used off the southern states of Australia to catch large schools of pelagic fish such as pilchards, jack mackerel or skipjack tuna. These schools are first located by visual sighting, spotter aircraft or sonar. Once the fish are located the vessel circles the school setting the net. The netting prevents the fish from escaping outwards. The purse line is then pulled which closes off the bottom of the net and prevents the fish escaping downwards.



- **Danish seine.** Danish seining is the main form of boat seine used in Australia. These nets are used to fish along the sea floor in depths to about 200 metres (i.e. on the continental shelf). They are used in NSW, Vic, SA, Tas and WA to target a variety of fish species including morwong, flathead and redfish. The gear is set in a pear shape with the net at the base of the pear and ropes making up the sides. The gear is hauled in such a way as to allow the ropes to herd the fish, before they tire and fall back into the bag of the net. The net is then hauled onboard and the fish emptied out.



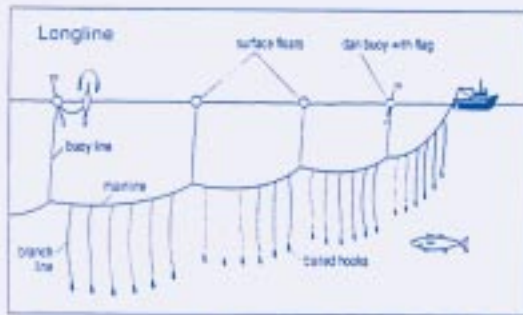
- **Gillnets and entanglement nets.** These nets consist of a panel or panels of net held vertically in the water-column. Fish or shark are entangled in the net when they swim into it. The size of the mesh in the net determines the size range of the species caught, as smaller fish are able to swim through the mesh. The legal net length and the mesh size are set by the appropriate State or Commonwealth fishery managers. Large scale driftnets have been banned in Australian waters. However, the smaller gillnets may be set to drift along at the surface (positively buoyant), for example as used to catch tropical sharks in Queensland and the Northern Territory. Gillnets can also be set or fixed on the seabed (negatively buoyant) and these are used in southern Australian waters to target school, gummy, and whiskery shark. They are also used Australia-wide in estuaries and along the coast to target fish (e.g. barramundi and king salmon in the north, bream and whiting in the south).



## Hook and Line

There are many different types of fish hooks and they are used to catch a wide variety of species and sizes of fish. The way in which fish hooks and lines are used often depends on the feeding behaviour and habitat of the fish targeted.

- **Handlines and handreels** are used commercially in all States. The main species targeted include coral trout and emperors in northern Australia, and redfish, tailor, snapper and Westralian jewfish in southern Australia.
- **Pole and line** fishing targets surface swimming tuna species in southern Australia, including southern bluefin tuna (SBT), skipjack tuna and yellowfin tuna. This technique involves attracting the surface schools of fish to the vessel, by getting them into a feeding frenzy with small bait fish. The operator uses a pole which ends in a barbless lure which the fish bite on. When a fish strikes, the pole is raised, lifting the fish out of the water and onto the boat.
- **Droplines** consist of a mainline of rope, wire or nylon anchored vertically in the water with a weight on the bottom and floats attached at the surface. Shorter lengths of line (called snoods) with a hook on one end are clipped to the mainline. Between 10 and 100 snoods are clipped at intervals along the mainline when it is being set for fishing. Up to 10 droplines may be set at one time. Droplines are used mainly in waters deeper than 200 metres off south-eastern Australia to target blue-eye trevalla and hapuku. Off WA they are used in shallower waters to target snapper and shark species. Droplines are set for several hours before hauling.



An alternative fishing method, called **bottom set longlines** (with 100-500 snoods) or **trollines** (with 10 snoods) is when an arrangement similar to the dropline is set along the seabed rather than vertically. These are good methods for fishing on the seabed when it is too rough for trawling.

- **Drifting longlines.** Drifting longlines are used off all States of Australia, except NT, by both Japanese and Australian vessels. Species taken include fast swimming surface fish such as southern bluefin tuna, yellowfin tuna and bigeye tuna, striped marlin and broadbill swordfish. Drifting longlines have the mainline suspended horizontally in the water at a predetermined depth by buoy lines with floats spaced regularly every 200-400 metres along its length. Branch lines 25-50 metres long are attached at regular intervals along the mainline. Each branch line has a baited hook and fishes at a different depth depending on its position and the amount of slack in the mainline between floats. The mainlines can range from 10 kilometres to 80 kilometres long, and can carry from 200 to 3000 hooks. The mainline takes 2-6 hours to set, and hauling may take 4-12 hours.
- **Trolling** is a simple method of fishing in which lines with baits or lures are dragged behind a boat as it moves along at a speed of 2 - 10 knots. Most commercial trolling operations have the lines mounted to the stern (rear) of the vessel or off booms at the side; they can troll 3 to 18 lines at once. Trolling is used Australia-wide to target species such as

Spanish mackerel, coral trout, yellowtail kingfish and several tuna species.

- **Squid jigging** is carried out in southeastern Australia to catch arrow squid and calamari. Jigging is done at night and powerful lights are positioned along the vessel to attract the squid. This takes advantage of the squid's strong attraction to light. The squid dart into the lit area to feed. The squid are caught as they feed by a line with several barbless lures which is hauled by an elliptical spool. The rotation of the spool as the line is wound creates the jigging action.

### Traps

Traps, pots or other enclosures are devices which fish (snapper, ocean jackets), crustaceans (e.g. lobsters, crabs) or molluscs (e.g. octopus) enter, but from which they are prevented from escaping. Animals are lured into a trap either by bait or because the trap appears to provide some form of refuge. Traps can be set in water from only a few metres to hundreds of metres deep. Most traps are set on the seabed with a haul-in line, surface float and dan buoy to mark their position. The traps are left to fish for 20 minutes to 24 hours before hauling, emptying the catch, rebaiting and resetting. There are many types of traps depending on the target species.

### Traditional fishing

Many Aboriginal communities and in particular Torres Strait Islanders still undertake traditional fishing using a range of fishing techniques and gear. Traditional fishing is usually defined as the taking of seafood by traditional inhabitants for their own consumption. Some of the species caught by traditional communities include reef fish, green turtles, dugong and shellfish. The majority of reef fishing is done with a handline from an outboard-powered aluminium dinghy, although multi-pronged spears are used along shallow reefs. Green turtles and dugongs are hunted from aluminium dinghies using a harpoon. Traps and nets are also used to target fish along the coast or in inland waters.

### Information sources

Chapman, L. B. (in preparation). *Commercial fishing gear in Australia*. Bureau of Resource Sciences, Canberra.

Kailola, P.J., Williams, M.J., Stewart, P.C., Reichelt, R.E., McNea, A. and Greve, C. (1993). *Australian Fisheries Resources*. Bureau of Resource Sciences and the Fisheries Research and Development Corporation, Canberra.

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Compiled by Gina Newton and Bill Causbrook, February 1995.

# Seafood facts 6 Careers and training

The seafood industry operates in a changing and competitive environment. Society is becoming increasingly complex and we are more and more affected by what is happening globally. We are now governed by a whole range of legislation and regulations about a variety of issues such as environmental sustainability, food safety, occupational health and safety, and import and export.

To keep up-to-date with these issues and to gain the competitive edge, the seafood industry needs to keep learning and developing.

Our industry provides ample scope for careers and training and it will continue to grow. A wide range of opportunities exist in the aquaculture, wildcatch, post-harvest and compliance sectors. You can learn on-the-job, at a TAFE college, at your own pace and use a variety of learning media such as CD-ROMs and online learning.

In many cases, you can gain nationally recognised qualifications and have your skills recognised when you choose to move from one job to another within one sector or even between sectors. For example, the skill and experience you gain working on a boat gives you a whole lot of knowledge which you can use if you decide to move into the area of fisheries compliance.

What you learn at one level could even entice you to pursue your career and studies further – the future is there for you to grab! Grow yourself at the same time as growing the industry.

## What types of careers are there?

**Commercial fisher:** Catches fish in accordance with fisheries regulations and maintains the quality of the catch while at sea. They use lines and nets, operate mechanical and communication equipment, and fish detection devices. They navigate fishing vessels.

Jobs in the commercial fishing include deckhand, senior deckhand, master fisher, fishing operations manager, marine engine driver, and fishing charter operator.

People working in the wild-catch sector of the Seafood Industry operate on fishing vessels that vary from small one person boats to larger ocean-going vessels with crews of up to fifteen. All crew members must work as a team, sometimes under difficult conditions. Fishing voyages can last from one day to several weeks or longer. Fishers perform a variety of tasks and use a variety of fishing techniques depending on the species being caught and the habitat.

**Aquaculturalist:** Farms seafood in controlled land-based or marine environments. They have skills in hatchery, nursery and fish grow-out operations. They understand water quality and seafood health issues. Jobs in aquaculture include aquaculture production hands, aquaculture specialists, and aquaculture managers.

**Fishing charter operator:** Conducts short fishing trips and longer fishing tours or holidays for members of the public. They help passengers catch and land fish and understand fish behaviour, fish habitats and fishing grounds.

**Fisheries officer:** Patrols waterways, inspects fishing vessels, checks fish sales and educates the community about fisheries resources management. They assist in managing and conserving Australia's fishing resources by ensuring they are not endangered or over-exploited.

**Seafood processor:** Prepares, fillets, preserves and grades a range of seafood products. They help maintain and improve the quality of the seafood we eat. Jobs in seafood processing include seafood processing assistant, seafood processing worker and seafood processing leading hand.

**Seafood wholesaler, exporter and importer:** Buys and sells fresh, frozen, live and processed seafood. They have a good knowledge of fish species marketing names, protected and prohibited species, quarantine requirements, customs operations and food safety programs.

**Seafood retailer:** Sells fresh, frozen and live seafood. They understand food safety and hygiene issues. They have extensive product knowledge to offer customers valuable advice.

**Fisheries scientist:** Provides essential research services for sustainability and development of our fisheries resources.

**Fisheries manager:** Looks after our fisheries resources for us all to enjoy now and for future generations. They make decisions about the best way to protect our fisheries from over exploitation while ensuring we can buy seafood or catch our own. They need a lot of information about the state of the fisheries and the human and environmental impacts on our fisheries.

The industry also has fisheries specialists in professions such as public administration, marine science, law, environmental sciences, journalism, public relations and communication, education and training, economics, information technology and marine architecture.

## Incentives for employers and employees – what's in it for me?

There are incentives available for employers and employees to help them pursue these training and career opportunities.

Trained employees can bring with them not only their skills but enthusiasm, loyalty and reliability as well. These are essential qualities for any organisation that wants to stay in business providing quality seafood products in Australia and overseas.

There is also a range of financial incentives for employers who take on a trainee (or 'new apprentice' as they are often called these days). There is a free booklet available from Seafood Training Australia which will give employers the information they need to employ a trainee, what type of incentives exist and ideas to help their business in this area.

### How do I find out more?

Contact **Seafood Training Australia** on ph. 1300 733 037. Your local representative there will be able to help you with your query. Alternatively, you can visit them at [www.seafoodtraining.com.au](http://www.seafoodtraining.com.au) and send an e-mail from there.

Seafood Training Australia specialise in education and training at secondary school level and at the vocational level (post-secondary). There are many programs available through TAFE colleges throughout Australia and private training providers. Your Seafood Training Australia representative will be able to help.

Every high school in Australia will have a copy of the Seafood Industry Implementation and Assessment Guide for VET in schools. This is an excellent resource for marine and seafood industry related studies.

### What about tertiary education?

Tertiary education is another avenue to a career in the seafood industry. A young person can pursue studies in fisheries at a university and later supplement this with 'hands-on' industry training at the vocational level. To find out more about **tertiary education** for fisheries related careers, contact the following institutions and websites:

- [www.studylink.com](http://www.studylink.com) (a comprehensive search of courses throughout Australia).
- Australian Maritime College [www.amc.edu.au](http://www.amc.edu.au)
- Deakin University, ph (03) 5563-3484, [www.deakin.edu.au](http://www.deakin.edu.au)
- Southern Cross University [www.scu.edu.au](http://www.scu.edu.au)
- Tasmanian Aquaculture and Fisheries Institute at [www.utas.edu.au/docs/tafi/TAFE\\_Homepage.html](http://www.utas.edu.au/docs/tafi/TAFE_Homepage.html)
- Central Queensland University ph. (07) 49 309 434

# Seafood facts 7

## Environmental initiatives

The Fisheries Action Program, Ocean Watch and SeaNet are just three of the many initiatives being undertaken by industry in partnership with government and community for the purpose of ensuring sustainable use of fisheries resources and their habitats.

### Fisheries Action Program

Australia's freshwater and marine environments are very important to the culture, commerce and natural heritage of all Australians. But there are major concerns. Recent documents, such as the National Policy on Recreational Fishing, the State of the Marine Environment Report and the National State of the Environment Report, have drawn attention to the fact that pollution and rapid development are threatening rivers, wetlands, estuaries, mangroves and coastal seagrass beds in all populated areas these environments provide vital nurseries and feeding grounds for fish and are crucial to the health and productivity of our fisheries increasing pressure on freshwater, estuarine and marine fish stocks and their environment by recreational, commercial and traditional fishing is combining with environmental degradation to put many fish stocks under increasing pressure.

In 1995-1996 the Ministerial Council on Forestry, Fisheries and Aquaculture initiated a series of nationwide community consultation workshops to discuss the idea of a program to redress the issue of habitat degradation and increasing pressure on fish stocks. At these workshops, the importance of involving the community in tackling fisheries issues was endorsed by a broad cross section of fishing groups, community groups and fisheries managers.

The Fisheries Action Program supersedes the National Fishcare Program. The new program aims to sponsor a major shift in attitudes regarding fish and fish habitats. It is designed to increase Australians' awareness of these issues-in particular, that of resource users-and to facilitate their involvement in local projects to assist the sustainable management of fisheries and their habitat.

The Fisheries Action Program is a component of the Natural Heritage Trust. It will cooperate with existing Commonwealth, State, Territory and local government initiatives and will support the work of catchment management, Landcare, Bushcare, Rivercare and Waterwatch groups in freshwater environments. The Fisheries Action Program will also work closely with coastal programs such as Murray-Darling Basin 2001, Coastcare and the range of Coasts and Clean Seas initiatives being implemented under the Natural Heritage Trust.

### The Fisheries Action Vision

We look forward to a future when the community's impact on fisheries and fish habitats is well understood by all resource users resource users are motivated to act on this understanding fisheries problems are identified and solutions implemented the community, resource users and governments are working well in partnership Fisheries Action projects have helped to restore fisheries and their habitat to a healthy state.

### Program objectives

Key objectives of the national Fisheries Action Program are to:

- Increase awareness of the problems affecting fisheries and their habitat;
- Facilitate community participation in fish habitat restoration and protection: Increase the community's commitment to sustainable resource use and fisheries habitat protection;
- Promote participatory research and investigations into the problems caused by the community's use of fisheries;
- Integrate fisheries issues with regional planning.

### Guiding principles of the Fisheries Action Program

These principles should help guide decisions and underpin the approach of the overall program. The guiding principles are to:

- Foster a sense of community ownership and responsibility for fisheries and their habitat;
- Encourage team work between resource users and the community, and with management and research agencies;
- Base strategies on a 'whole of environment' approach when addressing fisheries resource and habitat problems;
- Identify clearly the role and responsibilities of user groups in strategies and associated actions;
- Consider all economic, environmental and social implications of program strategies and actions;
- Raise awareness of the problems affecting fisheries and their habitat and of the need for sustainable practices and management.

### Key result areas

Consistent with the focus of the Natural Heritage Trust, the Fisheries Action Program aims to make an appreciable difference in four key areas, namely

**Integration and institutions** - integrated, cooperative and strategic approaches to investment in ecologically sustainable management of land, water and marine resources and environments

**Environment** - biodiversity conservation and improved long term protection and management of environmental resources, including aquatic plants and animals, representative ecosystems and World Heritage values

**Sustainable production** - maintenance of, and improvement to, the sustainable productive capacity of Australia's environmental and natural resource base

**People** - a community empowered to invest in, and take responsibility for, ecologically sustainable uses of its natural resources.

Achievements in these four key areas will be assessed during evaluation of individual projects and the Fisheries Action Program itself.

### **Management responsibilities**

The Fisheries Action Program is a cooperative Commonwealth, state and territory initiative of the Ministerial Council on Forestry, Fisheries and Aquaculture.

The program is delivered through the Natural Heritage Trust's 'one-stop shop' application and assessment process in accordance with the Partnership Agreements between the States and Territories and the Commonwealth.

*Information source: AFFA website [www.ffa.gov.au](http://www.ffa.gov.au)*



## What is Ocean Watch?

Ocean Watch is a non-profit organisation funded by the commercial seafood industry. Our sponsors include the Sydney Fish Market Pty Ltd, the Master Fish Merchants of Australia and commercial fishers. Ocean Watch was established in 1989 by the renowned Sydney restaurateur, Peter Doyle.

## Why was Ocean Watch established?

About two thirds of our seafood species are dependent on estuaries and inshore coastal habitats. Over recent decades, these areas have been heavily affected by land based activities such as coastal development, agricultural practices and increasing levels of pollution. All of these activities directly impact upon the viability of our fisheries by affecting important areas of fish habitat and water quality.

In 1989, following media reports about poor water quality off Sydney's beaches and the associated health risks linked to eating seafood caught in such waters, the seafood industry was quick to recognise the close link **and reliance it had on healthy fish habitats** and good water quality.

In response, the industry decided to establish and fund a full time program to protect and restore important areas of fish habitat, as well as to provide information and advice to members to assist them address these issues at the local level.

## What is Ocean Watch's Vision?

To achieve sustainability in the seafood industry by improving aquatic habitats and commercial fishing activities, working **with government, industry and the community** through activism, education and advice.

## What does Ocean Watch do?

Ocean Watch provides information to government and educates the public about environmental problems affecting waterways in New South Wales. It also provides advice to industry on sustainable fishing and on the nature of environmental issues to facilitate solutions and involvement at the local level. Ocean Watch works to protect and restore important fish habitat and nursery areas, improve water quality and promotes sustainable fishing by:

- Promoting the rehabilitation of wetlands and other important fish habitats;
- Educating the public and the seafood industry about environmental issues relevant to the marine environment;
- Lobbying the government about environmental matters concerning the industry; and
- Researching and providing environmental advice to the seafood industry.

As our popular maxim states 'No Habitat = No Fish'

## What are some of the major problems with our Waterways?

The types of issues affecting coastal waterways varies from place to place. Outside of the major cities wetland loss and pollution from excess nutrients, loss of riverbank vegetation, agricultural production, blockages of waterways and acid sulfate soils runoff are all major problems.

In the Sydney/Newcastle/Wollongong area wetland loss, waterway blockages, loss of riverbank vegetation and urban runoff all affect fish habitats.

Many of the problems we currently face are due to poorly informed decisions in the past, often many decades ago. Today, the job of rehabilitating and seeking ongoing protection for large areas of the coast is high on the agenda, and Ocean Watch continues to be a major player in promoting the rehabilitation of wetlands, floodplains and other important coastal and estuarine environments.

## Ocean Watch Campaign Areas

With respect to current issues and in accordance with Ocean Watch's strategic focus, the main campaign areas for Ocean Watch include:

1. Sustainable floodplain and wetland management and rehabilitation;
2. Improved management of Acid Sulfate Soils in coastal areas;
3. Reducing fishing industry impacts – marine debris and bycatch;
4. Increasing public awareness about the value of estuaries;
5. Monitoring of the NSW Fisheries' EIS process;
6. Establishment of Recreational Fishing Areas;
7. Establishment and management of Marine Protected Areas and Marine Parks;
8. *Caulerpa taxifolia*; and
9. Other matters as identified by industry.

### For further information contact:

Email: [ocean@oceanwatch.org.au](mailto:ocean@oceanwatch.org.au)  
Web Site: [www.oceanwatch.org.au](http://www.oceanwatch.org.au)



*The SeaNet project was established in 1999 and seeks to deliver extension services to the Australian commercial fishing industry. Its primary objective is to provide easy access to information and advice about bycatch reduction and environmental best practice.*

SeaNet is administered by Ocean Watch Australia Ltd and was created to facilitate progress in implementing sustainable fishing practices by putting in place a program that works closely with the commercial industry and receives their full support. The delivery of SeaNet services is based on:

- A reliance on face-to-face communication
- The hosting of extension officers in industry association offices
- The establishment of partnerships with researchers
- Encouragement of networking with research providers, industry groups, environmental groups and other interested parties.

Currently, there are five SeaNet officers working around Australia. Their location and industry host organisations include:

- Cairns, Queensland - Queensland Seafood Industry Association
- Victoria, Melbourne - Seafood Industry Victoria
- Sydney, New South Wales - NSW Seafood Industry Council
- Adelaide, South Australia - South Australian Fishing Industry Council
- Mooloolaba, Queensland - East Coast Tuna Boat Owner's Association

This approach has resulted in commercial fishers around Australia voluntarily working with SeaNet to trial bycatch reduction devices and techniques such as acoustic alarms ('pingers'), swim tanks ('hoppers'), square mesh panels, nordmore grids, and polyethylene haul seine nets. To encourage the increased uptake of bycatch mitigation measures and to ensure the ongoing commitment to 'environmental best practices' SeaNet also assists commercial fishers and fisheries to prepare, adopt and implement Environmental Management Plans, Codes of Conduct and Environmental Action Plans.

The initiative receives its primary funding from the Commonwealth Government's Natural Heritage Trust, as well as a great deal of industry support. SeaNet is overseen by a Steering Committee consisting of representatives from the commercial fishing industry, government, research institutions and environment groups.

## Examples of SeaNet Initiatives

### **Polyethylene Mesh Reduces Bycatch in Haul Seine Fishing (Victoria)**

SeaNet Victoria has been involved with a Marine and Freshwater Research Institute (MAFRI) project, which aims to reduce the impact of haul seine fishing on undersized and non-target fish. Already many fishers have taken notice of the bycatch reduction potential of polyethylene mesh for use in haul seine gear.

Polyethylene is a more rigid material than the more traditional nylon mesh used in seines, and holds its shape in the water. This results in far less fish being meshed in the wing sections of the net.

Recent surveys involving licensed fishers showed a 25-fold reduction in the incidence of undersized King George Whiting meshed. Already, almost half of the fishers questioned were using polyethylene, with many more planning to construct their next seine net from this material. This is good news for the marine environment, fish stocks and fishers alike.

### **Potential for Acoustic Alarms to Reduce Incidental Interactions of Marine Mammals with Mesh Nets (Queensland)**

The SeaNet Extension Officer in Queensland is working with volunteers in the Gulf of Carpentaria Gill Net fishery and Queensland East Coast Gill Net Fishery to trial pingers (acoustic alarms) in their regular fishing operations. A 'pinger' advertises the existence and location of a gill net to marine mammals by emitting a low intensity 'ping' every 4 seconds. Initial trials have shown that pingers can reduce the incidence of entanglement of marine mammals with gill nets.

There are currently 40 pingers placed with volunteer fishers in the Gulf of Carpentaria Gill Net fishery and 39 pingers with volunteers on the Queensland East Coast Gill Net fishery. The program is running smoothly with enthusiastic support from all volunteers.

For more information contact:  
Ph: (02) 9552 3181  
Email: [seanet@oceanwatch.org.au](mailto:seanet@oceanwatch.org.au)

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## Other networks and organisations

The **Marine and Coastal Community Network (MCCN)** is a national, non-government, community-based organisation with one Regional Coordinator in each State and the Northern Territory.

It works to increase Australian's understanding, appreciation, management and protection of marine and coastal environments and their biodiversity. It promotes a more cooperative and coordinated approach to marine and coastal planning and management by bringing together all the interest groups - individuals, community organisations, government agencies, industry, researchers and educators.

The MCCN provides a range of resources to help groups and individuals better understand the activities and issues that affect marine and coastal environments. It encourages and facilitates community participation in marine and coastal planning and management.

The MCCN is a national program administered by the Australian Marine Conservation Society (AMCS). It is supported by the National Heritage Trust (NHT) through Environment Australia's Marine Program.

Membership of the Marine and Coastal Community Network is free. For more information Call 1800 815 332 (free call) or visit [www.mccn.org.au](http://www.mccn.org.au)

**Coastcare** is a major component of the Coasts and Clean Seas program, the Commonwealth Government's coastal and marine initiative under the NHT. Coasts and Clean Seas provides funding to help address coastal and marine pollution problems, reduce threats to marine biodiversity and habitat degradation, and promote sustainable use of Australia's coastal and marine areas, including estuarine areas.

Coastcare supports direct community involvement in the management of coastal and marine areas. Its focus is on practical actions and on-ground works which tackle the causes of environmental degradation.

In addition to the Coastcare Community Grants, Coastcare provides funding for a national network of regionally based Coastcare Facilitators, national community awareness, promotion and sponsorship of Coastcare, and remote or difficult Coastcare projects.

For more information contact Environment Australia's Community Information Unit on 1800 803 772 (free call) or visit [www.environment.gov.au/marine/coastcare](http://www.environment.gov.au/marine/coastcare)

The **Australian Marine Conservation Society (AMCS)** is Australia's largest independent conservation organisation solely dedicated to the protection and conservation of the marine environment.

The AMCS is a recognised authority on many marine environmental issues and is used as a source of expertise and information by government agencies, politicians, media and the general public. AMCS represents the interests of conservation on a number of international and national committees and works closely with other non-government organisations within Australia and around the world. AMCS has many local branches around Australia.

For further information contact AMCS on 1800 066 299 (free call) or visit [www.amcs.org.au](http://www.amcs.org.au)

