

5. The Fishing Industry

Why is the Seafood Industry Important?

Seafood is a highly sought after commodity with estimates suggesting up to 90% of Australians eat seafood regularly. The locally produced seafood market for Australia is estimated as being worth approximately \$2 billion annually making it fourth highest agricultural earner after beef, wheat and milk. The vast majority of this demand for seafood is supplied by commercial fishers from around Australia who are required to operate under the various jurisdictions and regulations imposed by State, Territory and Commonwealth governments.

In 1999 the world's population reached 6 billion. By 2020 world population is expected to be greater than 7 billion. This will generate increased demand for seafood and place greater pressure on all natural resources. In the face of such pressures, the wild harvest and aquaculture fisheries must focus on environmental, social and economic sustainability see www.seafoodtraining.com.au/facts.aboutsfi.html.

The seafood industry in NSW is comprised of a variety of businesses that includes commercial fishers, fish farmers and oyster growers as well as a network of wholesalers, marketing and outlets of sale of processed and unprocessed seafood product to the community and for export.

Collectively all this business in NSW creates \$500 million worth of economic activity each year and employs over 4000 people directly. Commercial fishing within the NSW jurisdiction is currently worth more than \$90 million dollars at initial market sale.



Local snapper, source: OceanWatch Australia



Sorting through prawns caught on the Hawkesbury River, source: OceanWatch Australia

Commercial Fishing in NSW

Commercial fishing in NSW is divided into eight different categories or fisheries based on species caught and methods used to catch species. These are:

- Ocean Haul;
- Ocean Trawl;
- Ocean Trap and Line;
- Estuary Prawn Trawl (in the Clarence River, Hunter River and Hawkesbury River)
- Estuary General;
- Inland Restricted (targets carp and yabby mainly in the Murray Darling and Far West)
- Abalone; and
- Lobster.

For further information see <http://www.fisheries.nsw.gov.au/commercial/eight-fisheries>

Investigate methods of Commercial Fishing, types of seafood

<http://www.afma.gov.au/information/students/methods/default.htm>

http://www.afma.gov.au/information/at_a_glance/default.htm

These fisheries are restricted to operating in certain parts of rivers, estuaries and marine environs. For example, commercial fishing is not allowed in the 30 Recreational Fishing Havens in NSW www.dpi.nsw.gov.au/fisheries/recreational/your-fees/rfh, (only recreational fishing allowed), nor is it (or recreational fishing) allowed in certain zones within Marine Protected Areas (MPAs). These MPAs are areas within estuaries (including land which is inundated by the tides) and the ocean that are protected and maintained to preserve the natural habitats and biodiversity of the marine environment. These are like marine 'national parks' and are managed by the NSW Marine Parks Authority and the NSW Department of Climate Change. For further information see www.mpa.nsw.gov.au or <http://www.environment.nsw.gov.au/parktypes/TypesOfParks.htm>

Potential Impacts of Commercial Fishing

Whilst commercial fishing ensures that we all can enjoy fresh local seafood, commercial fishing can have some undesirable environmental impacts. These can include:

- unintentional catches of non-target species that cannot be sold (bycatch);
- over-harvesting of species placing pressure on fish stocks;
- disturbance of seabed habitats from fishing gears coming into contact with the seabed (note many areas are sandy and fishing has no impact);
- "ghost fishing", which refers to the unintentional capture of species that are trapped or entangled in lost or discarded fishing nets, line, traps etc; and
- pollution from wastes including motor exhausts and rubbish.

However, most impacts are managed and thus minimised under the Fisheries Management Strategies and also through various industry driven initiatives as outlined below. (It should also be noted that some problems have been created by poor management responses to issues.)

How is the Commercial Fishing Industry in NSW Regulated?

In New South Wales all commercial fishing operations are tightly controlled via the *Fisheries Management Act 1994* and *Fisheries Management (General) Regulations 2002*. The NSW Department of Primary Industries – Division of Fishing and Aquaculture is responsible for the management and major research related to fisheries and administers the NSW legislation and compliance with it.

Generally fisheries management is regulated by a combination of controls over input and output.

Input controls limit the amount of effort commercial fishers are able put into their fishing activity and so indirectly control the amount of fish caught.

This is achieved by regulating such things as:

- the number of licensees/fishers in a particular fishery;
- net length and mesh size limits that are able to be used;
- the size and engine capacity of boats; and
- the areas, timing or seasonal closure of certain fisheries. For example, fishers may request DPI to close an estuary for a certain period when key species are breeding. This helps to sustain the fishery.

Input controls may also include bycatch reduction devices (BRDs) that have to be attached to nets. These BRDs either work to allow more small or non-target fish to escape through the net or to prevent the capture of important non-target animals like sea turtles. (Bycatch are animals that are not targeted by the fisher, which are unintentionally caught and cannot be sold).

Investigate bycatch reduction and exclusion devices that reduce unwanted bycatch.



One type of BRD which is used by many prawn trawl fishing boats is the square mesh codend (part of the net where the catch collects). The square shape of the mesh means it remains open when it is full, allowing juvenile prawns and fish to escape, source: OceanWatch Australia

http://www.fisheries.nsw.gov.au/commercial/commercial2/bycatch_and_its_reduction

<http://adl.brs.gov.au/fishbycatch/index.php>

<http://www.afma.gov.au/environment/bycatch/default.htm>

<http://www.csiro.au/science/ps11j.html>

<http://www.oceanwatch.org.au/snindex.htm>

Output controls directly limit the amount of catch that can be taken out of the water. This includes set quotas for a particular species (numbers or weight) that can be caught in a specified time frame. For example, a fisher may be allocated 5 tonnes of a certain species that they can harvest in a particular fishing season.

Regulations controlling different fisheries can be complex having been developed over a long period of time and with differences in methods and other conditions of licences that vary from region to region.



Estuary Prawn Trawl Fishing on the Hawkesbury River, source: OceanWatch Australia.

The Commercial Fishing Industry and Environmental Sustainability

The commercial fishing industry has been involved in many initiatives to improve their own environmental performance and also initiatives which seek to improve or protect fish habitat and water quality, all very important to sustaining wild harvest fisheries. These include:

- Wetland Care Australia's rehabilitation projects <http://www.wetlandcare.com.au/>;
- DPI "Fish Habitat Monitors" – fishers notify DPI of any change to or disturbance of the aquatic environment and/or to fish stocks;
- Environment Management Systems for fisheries <http://www.oceanwatch.org.au/snprojectNSW.htm>; and
- Contributing to the core funding of OceanWatch Australia, a national environmental, not-for-profit company that works to achieve sustainability in the Australian seafood industry by protecting and enhancing fish habitats, improving water quality and advancing the sustainability of fisheries through action based partnerships with the Australian seafood industry, government, natural resource managers, private enterprise and the community. www.oceanwatch.org.au

The fishing industry also participates and is involved in OceanWatch Australia's various programs such as:

- "Tide to Table Program" which involves **on-ground works** to restore fish habitat across coastal catchments for the benefit of marine life, environment and the seafood industry; <http://www.oceanwatch.org.au/campaignAquatic.htm>
- "SeaNet Program", an environmental extension service to the Australian seafood industry and provides information and advice on improved fishing gear, technology and methods;
- "Aquatic Habitat Protection Program" which provides information and advice to governments, Natural Resource Management (NRM) managers, the community and other coastal and marine stakeholders in relation to NRM issues impacting on the seafood industry; <http://www.oceanwatch.org.au/campaignNSW.htm>
- "Fishing for Waste Program"; and <http://www.oceanwatch.org.au/OceanWatchAustralia-2007ProgramHighlights.htm>
- Introduced Marine Pests. <http://www.oceanwatch.org.au/snprojectVicSeastars.htm>

In summary, the commercial fishing industry has recognised that some of its previous practices and even current practices in some areas are



Sydney fishermen and bags of old net and line collected as part of OceanWatch Australia's "Fishing for Waste" program, source: OceanWatch Australia

unsustainable. As a result, industry members and associations have adopted new methods and promoted research into various areas of the fishing industry to work out ways to make practices more sustainable. The ongoing livelihood of fishers into the future depends on sustaining a healthy fishery and whilst managing authorities (DPI) have developed regulatory mechanisms, the industry generally adopts an approach that goes above and beyond these regulations. The industry has also been a champion and often a driver for improved ecological outcomes in estuarine and marine environs for all catchment users.

Investigate what some of these initiatives are about.

Aquaculture

Aquaculture is a sector of today's fishing industry that has in fact been long practised since traditional times by indigenous Australians. In more recent times it has been predominated by oyster growing in NSW but more and more it now incorporates a widening variety of species.

Furthermore, with increasing pressures on wild fish and other seafood stocks, aquaculture is being viewed as a way of intensively farming seafood species to supplement the wild harvest.

Some of the most common species that are farmed in include:

- oysters;
- yabbies;
- prawns;
- silver perch;
- trout; and
- snapper.



Sydney Rock oysters, source: OceanWatch Australia

More and more research is being spent on developing aquaculture opportunities in NSW with other species likely to become farmed in the future. Opportunities for indigenous communities to have a greater involvement today in aquaculture industries are being investigated and promoted by NSW DPI.

For those wanting to undertake land based aquaculture activities significant safeguards have been built into the approval process due to the potential for these intensive farming practices to have similar catchment/estuary environmental impacts as other forms of agriculture. Safeguards include prevention of excessive nutrient and other waste outflows and even disease output from fish farm ponds. The positioning of such ponds and the species allowable are also taken into account to minimise risks posed by flood events that might otherwise lead to wastes, nutrients, diseases and even the aquaculture stock escaping to the environment.

<http://www.dpi.nsw.gov.au/fisheries/aquaculture>

<http://www.australian-aquacultureportal.com/>

Specific environmental and health issues and Initiatives of the Aquaculture Industry include:

- NSW Shellfish Program (NSWSP) - the primary purpose of this program is to ensure that shellfish produced in NSW are of the highest standard; and the <http://oysterfarmers.oystersdirect.com.au/qap/index.htm>
- NSW Oyster Industry Sustainable Aquaculture Strategy (OISAS) – this strategy has a number of objectives but primarily relates to ensuring that areas for oyster growing are recognised, given due consideration in planning and other decision making and that due efforts are made to ensure these areas remain viable healthy areas for oyster growing.



Oyster leases, Clyde River NSW, source: OceanWatch Australia

<http://www.dpi.nsw.gov.au/fisheries/aquaculture/publications/oysters/industry/nsw-oyster-industry-sustainable-aquaculture-strategy>

Oyster Industry in NSW <http://www.dpi.nsw.gov.au/fisheries/aquaculture/publications/oysters/industry/oyster-industry-in-nsw>

Sydney Rock Oyster Fact Sheet

<http://www.dpi.nsw.gov.au/fisheries/aquaculture/publications/oysters/oysters/diseases-of-sydney-rock-oysters>

Diseases of Oysters

http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0004/164182/Diseases-of-Sydney-rock-oysters.pdf

<http://www.dpi.nsw.gov.au/fisheries/aquaculture/publications/oysters/oysters/diseases-of-sydney-rock-oysters>

QX disease <http://www.dpi.nsw.gov.au/fisheries/aquaculture/publications/oysters/oysters/qx-oyster-disease>

Fish Diseases and Human Health

<http://www.dpi.nsw.gov.au/fisheries/aquaculture/publications/health/fish/fish-diseases-and-human-health>

Depuration <http://www.dpi.nsw.gov.au/research/areas/production-research/aquaculture/outputs/1999/depuration-shellfish>

Recreational Fishing

One in four people participate in recreational fishing in NSW. These people, i.e. recreational fishers, spend substantial sums of money carrying out their interest/sport and this expenditure is highly significant to regional economies where recreational fishing popularly occurs. Between 2005 and 2006, it was estimated that recreational fishers in NSW spent more than \$550 million on fishing related items such as fishing gear and a variety of other less easily defined items such as camping gear, boat accessories etc.

Recreational fishers in NSW use a variety of capture methods to catch more than 200 varieties of fish species, with approximately 30 species making up the bulk of the catch.

For most of these species commercial fishing catches are greater than the recreational catch for that species but for several common species the opposite was true. Nevertheless the total fishing effort by recreational fishers is substantial with significant impact on aquatic resources.

http://www.dpi.nsw.gov.au/archive/news-releases/fishing-and-aquaculture/2004/19_apr_04_-_how_much_is_recreational_fishing_worth_to_coastal_towns

<http://www.dpi.nsw.gov.au/fisheries/recreational/publications/general/Survey-of-Recreational-Fishing-in-New-South-Wales.pdf>

<http://www.asfb.org.au/pdf/1994/1994-00-01.pdf>

<http://www.asfb.org.au/pdf/1994/1994-04-02.pdf>

<http://www.asfb.org.au/pdf/1994/1994-04-04.pdf>

Investigate the most common recreational fish caught and the method most commonly used to catch it. Find out about the species life cycle and the importance of estuaries to it.

<http://www.fishnames.com.au/>

http://www.marine.csiro.au/caab/standard_names.htm

http://www.marine.csiro.au/caabsearch/caab_search.fish_names_list

<http://www.seafoodservices.com.au/>

http://www.frdc.com.au/shop/merchant.mvc?Screen=SRCH&Store_Code=photo



Beach fishing, NSW, source OceanWatch Australia



Recreational fishing at Tathra NSW, source: NSW DPI

Potential Impacts of Recreational Fishing on the Environment

Recreational fishing can have some undesirable impacts on the environment. These activities and their impacts can include:

- catching undersize fish i.e. catching too many baby fish which have not yet had a chance to breed;
- over-harvesting of species placing pressure on fish stocks;
- leaving behind fishing line and tackle and dumping rubbish, which can entangle animals causing either injury or death,
- motoring at high speeds in narrow waterways, creating boat wake which erodes riverbanks; and
- motoring through seagrass beds, damaging or destroying the fragile fish habitat.



Littered fishing line which can entangle pelicans and other marine life, source: OceanWatch Australia

How is Recreational Fishing Regulated?

The recreational fishing industry is divided into two sectors; a freshwater inland component and a marine and coastal estuary component. Both of these sectors are regulated by licences from the NSW Department of Primary Industries (DPI) – Fishing and Aquaculture. This means that anyone who wishes to go out and catch a fish must buy a license beforehand.

<http://www.dpi.nsw.gov.au/fisheries/recreational/licence-fee>

There are special rules and regulations surrounding where you can fish, the sizes of fish you can keep, where you can collect bait, the methods you are allowed to use to catch fish and collect bait. However, unlike commercial fishing, there has not been any detailed assessment of the environmental impacts of recreational fishing in NSW or any management strategies put in place to deal with these impacts.

<http://www.dpi.nsw.gov.au/fisheries/recreational/regulations>

Investigate the rules surrounding recreational fishing, what is an Intertidal Protected Area or IPA, what are the rules about bait collecting.

<http://www.dpi.nsw.gov.au/fisheries/closures/general/invertebrates-ipa>

http://www.fisheries.nsw.gov.au/marine_protected_areas/ipa

http://www.fisheries.nsw.gov.au/_data/assets/pdf_file/0015/5055/Habitat-Protection-Plan-Hawkesbury.pdf

Recreational Fishers and Sustainable Fisheries

The recreational fishing industry is also involved in a number of initiatives aimed at benefiting the sustainability of the fishery or reducing their impact on the environment. These include:

- OceanWatch Australia’s “TAngler Bin” project. <http://www.oceanwatch.org.au/TAnglerBinProject1.htm>
- RecFish Australia’s “Catch and Release” Program

The NSW DPI Fishing and Aquaculture Recreational Fishing Trust (Saltwater Trust and Freshwater Trust) also funds a variety of initiatives that are aimed at educating and promoting recreational fishing in a sustainable way. (The funds collected from recreational fishing licences are pooled into this Trust and spent on things which improve recreational fishing in NSW).

<http://www.dpi.nsw.gov.au/fisheries/recreational/your-fees/>

What Are the Main Environmental Issues Affecting the Fishing and Seafood Industries?

There are some major environmental issues that affect the fishing industry and its seafood products. The industry is dependent on healthy coastal aquatic habitats and good water quality which can be threatened by the following:

- Disturbance and destruction of important nursery areas for baby fish and crustaceans such as wetlands, mangroves, saltmarsh and seagrass beds:
 - Degradation can be caused by inappropriate development in these habitats, recreational use which damages plants and soils or invasion by weeds.
- Pollution of waterways from urban stormwater, farm runoff, industrial discharges or illegal dumping of chemicals:
 - Toxins can accumulate in food chains and become more and more dangerous for humans to consume and may actually kill aquatic animals such as fish.
 - In some areas in NSW, whole oyster production areas have become contaminated by water pollution and have had to shut down their production.
- Disturbance of acid sulfate soils can cause acid and heavy metal contamination of waterways and wetlands:
 - This can cause fish to become vulnerable to diseases and parasites or may result in massive fish kills.
 - Disturbance is usually caused by development of land for housing, industry, agriculture or drainage works.
- Degradation or removal of riparian vegetation, mainly as a result of clearing, grazing and weed invasion:
 - This damages fish habitat in many ways and can lead to fish population decline. Riparian vegetation is very important for fish and fish habitat as it provides shade, bank stability and hosts thousands of insects and bugs which are food for fish. Bank vegetation also provides fallen branches which fish and other species use to shelter under and spawn.
- Climate change impacts:
 - Plants and animals can mostly only tolerate small changes in water temperature and chemistry. Climate change may cause changes that aquatic plants and animals cannot tolerate. As seagrass, mangrove and saltmarsh habitats decline due to climate change, so will many of our commercial seafood species.



Cleared riverbanks showing signs of erosion, Clarence River NSW, courtesy of DECC

Sources of Additional Information

<http://www.afma.gov.au/information/publications/education/default.htm>

<http://www.afma.gov.au/information/students/game.htm>

<http://www.afma.gov.au/information/maps/default.htm>

<http://www.afma.gov.au/information/glossary.htm>

http://www.asic.org.au/related_sites.html

<http://www.frdc.com.au>

Turtles <http://www.environment.nsw.gov.au/surveys/MarineTurtleSurvey.htm>

Sea Grass http://www.frdc.com.au/bookshop/seagrass_research.pdf

<http://www.seafoodtraining.com.au/facts.aboutsfi.html>

<http://www.oceanwatch.org.au/>

<http://www.asfb.org.au/>

http://www.asic.org.au/related_sites.html

Seafood Training Australia (STA) (2007) - Facts about the Australian seafood industry

<http://www.seafoodtraining.com.au/facts.aboutsfi.html>

Fisheries Research and Development Corporation <http://www.frdc.com.au/>