



FREQUENTLY ASKED QUESTIONS

Marine aquaculture

FAQ #7

WHAT IS MARINE AQUACULTURE?

Marine aquaculture is the farming of marine animals and plants, especially fish, shellfish and seaweed, in natural or controlled marine or estuarine environments.

Aquaculture has been undertaken in a number of countries for centuries and has grown rapidly worldwide in the last 50 years. In 2014, the world's population consumed more farmed fish than wild caught fish. With the world's per capita fish consumption doubling from about 10kg in the 1960's to 20kg today, aquaculture has the potential to fill growing global demand for seafood.

Marine aquaculture produces a wide variety of animal and plant species including finfish, crustaceans, molluscs, echinoderms, marine worms, as well as seaweeds and other aquatic plants. These products can be used for consumption, pharmaceuticals, jewellery and ornamental purposes. Hatcheries also provide juvenile stock for stock enhancement in estuarine and marine waters of NSW.

There are a variety of aquaculture production systems used to farm target species. For marine aquaculture, floating sea pens are typically used to farm finfish; longlines (suspending cultivation) or post and rail infrastructure are used for shellfish in estuarine areas; and land based facilities farm species in earthen and lined ponds, tanks and aquaria. The fundamental aspect of any aquaculture development is a reliable supply of good water quality.

AQUACULTURE IN NSW

The NSW oyster industry has a history dating back to the 1870's in the Georges River and is the State's largest aquaculture sector worth in excess of \$44 million annually. The Rainbow Trout and aquarium industries were key aquaculture industries in NSW until the 1980's saw the advent of Black Tiger Prawn farms on the north coast and native fish hatcheries in inland NSW. By the 1990's Silver Perch, Yabbies, Barramundi, Snapper and Blue Mussels were being farmed. Mulloway are produced in earthen ponds and Yellowtail Kingfish are also in production in offshore sea pens. Non-oyster aquaculture production including hatcheries accounts for over \$20 million annually in NSW.



WHAT SPECIES ARE FARMED IN NSW?

OYSTERS

Oyster aquaculture (Sydney Rock, Pacific, and Native Oysters) is conducted in 32 estuaries along the NSW coast from the Tweed River to Wonboyn Lake utilising



some 3,000ha of leases. Cultivation techniques have advanced over the years from stick culture, where oyster larvae settle on tarred hardwood stick, to more modern infrastructure such as recyclable plastic trays and baskets. Hatcheries now also produce oyster spat.

Oyster infrastructure is mainly found in the intertidal zone of estuaries, where oysters are exposed at low tide. Some production is also found in the subtidal zone where baskets or trays of oysters are suspended from rafts or pontoons into deeper water. In areas where seagrasses may be found suspended longline basket systems are deployed as they have minimal impact on the seagrass. Akoya pearl oysters are also cultured in NSW waters.

A typical growing time to market for Sydney Rock Oysters is three years, Pacific Oysters 18 months, and Native Oysters two years. In 2015/16 some 6 million dozen oysters were produced for sale in NSW.

BLUE MUSSEL

Twofold Bay at Eden has a 50ha mussel farm and is renowned for its reliable spat settlement and excellent growing conditions for mussel longline culture. Another 50ha of leases is approved for [mussel culture](#) in Jervis Bay.

MULLOWAY

Mulloway can be grown in land-based pond systems or sea pens. In northern NSW former prawn farms have been converted into Mulloway aquaculture facilities. Growout densities of 15kg of fish per 1,000L of water can be achieved.

PRAWNS

Prawn farming in NSW is located around the Clarence River in northern NSW, mainly due to the warmer water temperatures that are required. The most commonly cultured prawn is the native Black Tiger Prawn. Prawn farming operations in NSW are based on hatchery-reared larvae transferred to outdoor earthen ponds. Prawns are reared to 30 grams in six months.

YELLOWTAIL KINGFISH

A joint research project between NSW DPI and Huon Aquaculture is underway to assess the sustainability and viability of farming [Yellowtail Kingfish](#) in sea pens off the coast of Port Stephens. The sea pens being used are a world first in design to prevent marine wildlife and seabird interaction with the fish and also deliver safety improvements for farm workers. The research project is investigating environmental performance, husbandry and production technologies, and diet development work.

OTHER LAND BASED AQUACULTURE FARMS

Along the coastal fringe there are some 67 land based farms comprising finfish and oyster hatcheries, and grow-out farms for Moreton Bay Bugs, Silver Perch, freshwater Crayfish, marine bait worms and ornamental aquarium species.

HOW IS THE AQUACULTURE INDUSTRY MANAGED IN NSW?

NSW DPI regulates the NSW aquaculture industry by an aquaculture permit and lease system to impose compliance conditions and recover costs for administration, research, lease rental and lease security bonds. The NSW Government also uses a whole of government approach to promote sustainable industry development of the oyster and land based industries in NSW. The NSW Oyster Industry (2006) and Land Based (2009) Sustainable Aquaculture Strategies detail a streamlined approval process and advice on best aquaculture practice for

species and site selection, design and operation. Water quality protection guidelines are detailed for oyster aquaculture and oyster harvest areas as well as identification and long term security of oyster leases.

NSW government agencies are currently preparing a NSW Marine Waters Sustainable Aquaculture Strategy. This strategy will detail environmental assessment processes for aquaculture in NSW marine waters by considering locational, design and operational criteria as well as detailing environmental monitoring programs for sustainable farming practice. These Strategies take effect under the *State Environmental Planning Policy 62 – Sustainable Aquaculture* (SEPP62).

AQUACULTURE AND WATER QUALITY



Water quality is a critical factor in all types of aquaculture. Optimal water quality requirements vary according to the species being cultured and must be constantly monitored to ensure growth and survival.

Oysters have long been associated as a sentinel species for the water quality management of our estuaries. If the oysters are healthy and suitable for human consumption, then it is likely that the estuary as a whole is healthy too. Oyster farmers regularly monitor water and oyster meat quality to meet the stringent standards of the NSW Shellfish Program. Most often oyster farmers identify issues of concern that impact healthy waterways (sewage, sediment runoff, non-complying developments). The aquaculture industry in NSW has long been an advocate for water quality protection and sustainable catchment management.

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (February 2017). However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date and to check the currency of the information with the appropriate officer of the Department of Primary Industries or the user's independent advisor. Published by the Department of Primary Industries.

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IS AQUACULTURE APPROPRIATE IN A MARINE PARK?

NSW Marine Parks are zoned for multiple uses and protect marine habitats and species while catering for a wide range of sustainable activities. In NSW, there are over 1500ha of oyster leases operating in Marine Parks (including Sanctuary Zones), Nature Reserves, National Parks and Aquatic Reserves. Jervis Bay Marine Park has 50ha of approved extensive aquaculture leases within its Habitat Protection Zone. The recent Yellowtail Kingfish research project is also within the Habitat Protection Zone of the Port Stephens - Great Lakes Marine Park.

A recent study of NSW coastal aquaculture and community values identified that:

- Aquaculture and the flow-on effect to seafood processing and retail businesses had a likely output of \$226m in 2013/14
- Aquaculture in NSW provided 1,758 full-time jobs in 2013/14
- 94% of people agree it is important we produce our own seafood in NSW and 89% of NSW residents expect to eat local seafood when they visit the coast.

Barclay, K., McIlgorm, A., Mazur, N., Voyer, M., Schnierer, S., Payne, A.M., 2016, Social and Economic Evaluation of NSW Coastal Aquaculture, Fisheries Research and Development Corporation (FRDC 2015/302) and University of Technology Sydney.

MORE INFORMATION

- [NSW Department of Primary Industries aquaculture website](#)
- [NSW Land Based Sustainable Aquaculture Strategy](#)
- [NSW Oyster Industry Sustainable Aquaculture Strategy](#)
- [Yellowtail Kingfish Research Project](#)
- [NSW Aquaculture Facts and Figures](#)