

Tuggerah Lakes Estuary – Jewel of Wyong Shire



Definition

An estuary is a semi-enclosed coastal body of water with one or more rivers or streams flowing into it, and with a free connection to the open sea. They are affected by marine influences like tides, waves and the influx of salt water, and riverine influences like flows of fresh water and sediment. As a result they are associated with high biological diversity.

Wikipedia



What is the Tuggerah Lakes Estuary?

Tuggerah Lake, Budgewoi Lake and Lake Munmorah are three interconnecting coastal lagoons which together are known as The Tuggerah Lakes Estuary. The Lakes are a central and dominant feature of Wyong Shire with high environmental significance and the focus of many recreational activities.



Who owns the Lakes?

The NSW Government owns the Lakes but as Wyong Shire Council is the major land manager in the catchment it currently spends around \$3 million per year on their maintenance. However the Lakes are enjoyed and impacted on by the activities and decisions of so many, that improving their health will only be achieved by active and ongoing strategic partnerships.

Lakes Facts

Tuggerah Lakes stretch from Killarney Vale in the south to Lake Munmorah in the north. Their total area covers about 80 km², which equates to about 10% of Wyong Shire.

- ✦ Tuggerah Lake – 5km wide and 13km long.
- ✦ Budgewoi Lake – 4km wide and 4km long
- ✦ Lake Munmorah – 2km wide and 4km long.

The average depth of all three lakes is about 1.7 metres, although in parts around Toukley Bridge, Budgewoi Bridge and much of Lake Munmorah, depths of 3- 4 metres can be found.



The History of Tuggerah Lakes

Information sourced from *Tuggerah Lakes Way Back When...* Scott 1992, Sainty and Associates.

First population

Well before European settlers arrived, three Aboriginal communities lived around Tuggerah Lakes; the Guringai, Darkingung and Awabakal tribes. The Lakes were a good source of food, particularly the abundance of fish and waterfowl. Their subsistence lifestyle of hunting and gathering would have had minimal impact on the environment.

Aboriginals spearing fish - 1834

Monday 27th.we had our friends Mr Bean and Mr Edwards to breakfast with us, and afterwards went down to the beach to see the natives spear fish in the water, they wait till the water is shallow, and then several enter, together swimming and wading, and pursue the fish with astonishing swiftness and dexterity: the spear usually made of the stem of the grass-tree, has three strong points, and is sometimes thrown from the hand alone, and sometimes from a sort of sling of a peculiar construction which gives it amazing force, this they call the "Wamerah", the fish-spear is called "Moontim": they seem to enjoy the sport excessively, laughing and shouting all the time, in which the rest of them on shore seemed to participate, it was really a very animated scene, and would have formed a sketch for a painter.
(Journal of Sarah Mathew – wife of surveyor Felton Mathew, Jan 1834. Stinson, vol 4, 1983)

European settlement

The first European settlers moved into the Wyong district in the 1820s initially for cattle grazing and dairying. Logging began soon after. At first the impact of logging and clearing was minimal but from the 1860s onwards the Lakes would have begun to experience increasing rates of sediments and nutrients entering the system via Wyong River and Ourimbah Creek. Commercial fishing also became established in the 1860s.

The Railway

The opening of the Great Northern Railway from 1887 – 1889 was the single most important factor in the development of the district. With a rail line in place, timber and fresh farm produce could be quickly transported quickly to Sydney and these industries began to boom.

By the 1920s, the timber industry was declining and the dairy industry increasing with two hundred farmers sending their milk to the new butter factory for processing by the 1930s. Poultry farming became big in the Kanwal and Warnervale areas with the district becoming the largest egg producer in the state. The railway was also used to transport fish to Sydney with the increasing numbers of professional fisherman now living at the mouth of Wyong River (Tacoma).

Tourism

In the first half of the 20th century, the Central Coast was becoming known as a favourite holiday destination, particularly The Entrance. By the 1920s subdivisions were being built with many lots devoted to future holiday accommodation. By 1954 the population of Wyong Shire was 13,100.

Urban development

From the 1960s the focus shifted from agriculture and timber to urban development, with the construction of Munmorah Power Station and associated coal mines. The dairy industry declined and land prices climbed. The population was rapidly changing from holiday-makers to more permanent residents, with the Central Coast being the fastest growing urban district in south-eastern Australia during the 1970s. Urban development continued through the 1980s largely due to the extension of the Sydney – Newcastle freeway and the electrification of the railway. By 1990 the population had risen to 102,000 and continues to grow.



Timeline: The NSW Estuary Management Process

1997	1997 – 2001	2001	2002 – 2005	2005	2006	2006	Present	Future
Wyong Council's Estuary Management Committee set up.	Biological and physical information collected.	Public exhibition of the Estuary Process Study. Public comment invited.	Develop management objectives and options.	Public exhibition of Estuary Management Study. Public comment invited.	Develop management actions and costs. Public comment invited.	Public exhibition of Estuary Management Plan.	Implementing Estuary Management Plan	Regular monitoring and review of outcomes.

YOU ARE HERE!

Toukley in the 1940s and 1950s

Toukley wasn't developed then, there was just a dirt road running up, initially we used to camp in a boatshed down towards the bridge from here. Toukley was just bush and a few weekenders. I can recall as a child there was not a light around these foreshores at night-time, but now there are lots of lights from all the new suburbs. I also remember there were plenty of rabbits and wallabies in the area. (Bill Hansen)

Urban development

The lake foreshores are wall to wall houses, you used to be able to go along the bottom of Tuggerah Lake and you would hardly see a house, you used to only see little fibro or weatherboard fishing huts, but now it is just wall to wall houses. (John McPherson)

How has urban development impacted on the health of Tuggerah Lakes?



Only 50 years ago, the communities surrounding Tuggerah Lakes were made up of small fishing villages and holiday cabins. Now Wyong Shire is a bustling urban centre with an estimated population of more than 140,000.

This rapid growth of population and industry in the Lakes' catchment over the past 190 years has had significant and long-term ecological consequences for the Lakes including:

- High nutrient loads from septic systems from the 1960s to 1980s;
- Nutrients and other pollutants from urban runoff, particularly during storms;
- Reclamation of surrounding wetlands for industrial, recreational and housing developments;
- Loss of riparian vegetation around the lakes due to housing developments and;
- Dredging and reclamation activities along the shorelines of the lakes.

Life in the Lakes

The Lakes are home to a range of aquatic life including flathead, bream, garfish, whiting and blackfish, as well as protected species such as pipefish and seahorses. They also feature many rare and significant vegetation types including saltmarsh, seagrass, swamp mahoganies and freshwater wetlands. This vegetation, in turn, supports important habitats for endangered birds such as regent honey eaters and swift parrots, as well as endangered squirrel gliders.

The importance of saltmarsh

A saltmarsh is a plant community that commonly grows around foreshores and helps the freshwater and saltwater environments. Historically saltmarshes have been treated as 'wastelands' but today they are recognised as one of the most biologically productive habitats on the planet, rivalling tropical rainforests.

In NSW, saltmarsh has recently been declared an Endangered Ecological Community under the NSW Threatened Species and Conservation Act meaning it is in immediate danger of extinction.

Tuggerah Lakes has lost over 85% of its saltmarsh and modifying the Lakes' foreshores to allow increased areas of saltmarsh to grow is a major feature of the Estuary Management Plan.



Weed in the shallow water - 1891

The sea entrance, Ourimbah Creek, Wyong Creek, and the big flat on the eastern side of Budgewoi Lake, which were swarming with young fish, especially mullet, in fact young fish were very plentiful all round the shores of the Lake, where the nets could not disturb them owing to the shallow water and the weeds. (1891 Fisheries Annual Report)

Stack weed is good habitat for fish

The main weed for fish is what they call 'stack weed'. The other one is 'ribbon weed'. The ribbon weed used to feed the fish but gives no shelter. The young fish came to the shallow water, and the pelicans and shags would eat them all, so you would never get lots of fish until you have stack weed. Now the stack weed is like a blackberry vine, it came to the top of the water, and they couldn't eat the small ones, so fish was plentiful. (Arthur Clouten)

Fishing Inspector's comments

The Fisheries Inspector, stationed at Lake Macquarie between 1949-1952 and then at Tuggerah Lakes from 1956-1965, has talked with the old professional fishermen of the Lakes who claim the growth of stackweed in the twenties was so severe it hampered fishing and movement of boats on the Lakes. The Inspector also recalls the decline in weed cover of the late forties such that by the mid fifties Canton Beach was clean sand. Following this there was a rapid growth of weeds culminating in the severe problem of 1960-1962. (extract from the Interdepartmental Report on the Tuggerah Lakes, published in 1979)

'Weeds' in the Lake

Many people use the term 'weeds' when referring to any plant growth in the Tuggerah Lakes. In fact there are two different types of plant life, seagrasses and algae.

Seagrasses are flowering plants and are found in soft sediments like sand or mud in the sheltered shallows of estuaries. Tuggerah Lakes contains three types of seagrass; eelgrass or ribbonweed (*Zostera capricorni*), stackweed (*Ruppia megacarpa*) and breamweed or paddleweed (*Halophila ovalis*). Seagrasses play a vital role on the ecology of the lakes and support an abundance of fish and bird life.

Algae are a natural part of the lakes ecology and are an important food source for many animals. In the Tuggerah Lakes the most visible form of algae are the large mats of macroalgae. Local fisherman often refer to the macroalgae as 'wool or slime'. Macroalgae occur throughout the year but in spring and early summer often grow rapidly. There are also microscopic algae known as epiphytes that live on seagrasses. These are a valuable source of food for many animals. When the nutrient levels in the water are too high excessive growth of macroalgae can occur causing algal blooms.

When strands of seagrasses and macroalgae wash up along the shoreline they can form large piles of dead plant matter, creating the 'wet weed' smell. Older residents and fisherman can recall such smells right back to the 1920s and 1930s. Some believe the smell got much stronger from the 1970s onwards.

In the late 1980s and early 1990s Tuggerah Lakes suffered from macroalgal blooms which spread across the shallow waters around the shoreline. There was also concern about the associated increase of mud and ooze, unpleasant odours and an apparent decrease in fish and prawn stocks.





Pollution from houses harmed the lakes

I think the lakes have changed because of what has gone into it over the years because of all the development, the septic runoff, the soaps, the detergents. Everyone blamed the Power Station and I don't imagine the hot water helped, but it wasn't the main cause. When I first moved to Chittaway Point in the '30s there were only eight homes there. But all their washing water and detergents went straight into the creek. If you wanted to go swimming sometimes you notice that someone has just drained their tub of dirty water into the creek. That has happened thousands of times over and over now. We didn't have detergents in those days, just sunlight soap, but once these detergents appeared on the market, that is when all the trouble started. (Arthur Sterrit)

Urban stormwater

In the late 1980s they started putting in silt traps on creeks entering the lake. Periodically they would inspect them and dig them out. They also make sure sand bags or hay bales are put across gutter at building sites to stop the silt. There is a lot more control now for erosion. Also, now there are more tarred roads so most of the dirt roads have gone. But there still are problems if the silt traps aren't cleaned out and there can also be problems in the new sub-divisions because of all the dirt, when it rains it just goes everywhere. (Pat Calphy)

Urban pollution - there used to be none

A lot of people say the drainage, the detergent, is going into the lake and feeding it (the weed). That's half the problem with the lake now. Nothing used to go into the lake, there was no houses there then. (Elizabeth Dennis)

Nutrient Pollution

Erosion and sediments.

The original catchment of the Wyong River, Ourimbah Creek and Wallarah Creek were forests. However, land clearing for agriculture and timber would have resulted in a steady increase in erosion throughout the 19th century. Eroded sediments move into streams and rivers, and eventually the Lakes. The highest rates of erosion probably occurred in the late 1800s and early 1900s when large areas of land were being cleared for the rapidly expanding industries. Today, erosion control practices and the increased awareness of catchment management principles have helped reduce sediment.

Fertiliser and organic matter

Nutrients can also enter the lakes in the form of plant fertilisers and organic matter (such as animal manure or leaf litter). Fertiliser use on farms in NSW increased sharply from the 1950s onwards and during heavy rainfall it is inevitable that some of this fertiliser dissolves in runoff and flows into the Lakes. While the two main users of fertilisers, citrus and dairy industries have declined in the last few decades, this gain has been partially offset by the increase of the turf industry. Overall, the use of fertiliser in the catchment of Tuggerah Lakes has probably declined from its peak in the 1960s and 1970s.

Sewerage

Early in the 20th century there was no reticulated sewerage system and each house had a pit toilet to dispose of human waste. Greywater from washing and bathing was discharged into drains and eventually flowed into the lakes. When there were few houses around the Lakes this probably only had a small impact, but as small towns began to spring up in the 1940s and 1950s the sanitary pan service began.

When town water was connected in the late 1950s and 1960s, including the introduction of flushing toilets and septic systems, the volumes of greywater increased becoming a significant source of pollution. Seepage from septic tanks in the 1960s and 1970s was regarded by many as a major cause of pollution. These problems were exacerbated by a rapidly increasing population and led to the introduction of a reticulated sewerage system from the 1960s to the 1990s. The sewage was pumped to sewage treatment plants and this greatly reduced the pollution entering the lakes.

Stormwater runoff

Prior to urban development, much of the runoff in the catchment would have soaked into the ground and not reached the lake. However a tenfold increase in residential, commercial and industrial areas around the Lakes has caused a very large increase in runoff, particularly during heavy rainfall. The stormwater is usually directed down concrete drains and watercourses, carrying with it soil from building sites, leaves, fertilisers from gardens, litter from footpaths, oils from roadways and pollutants from factories. The highest sediment loads are generated from new development areas where large areas of loose soil are exposed.

Urban runoff is considered to be one of the main contributors of nutrients to the shallow edges of Tuggerah Lakes, where excessive macroalgal growth has caused the most problems. As a result over the last decade there has been an increased effort by Wyong Shire Council to construct sediment traps, trash racks and filter strips on stormwater drains, and increase public awareness through education campaigns. The Council has also been active in sealing all exposed road shoulders and gutters to reduce quantities of eroded sediment.

Fishing in the 1920s

In those days it was possible to make a living catching mullet, luderick and a few flathead for about 9 months of the year but very few could be caught during July, August and September. The main lake was very weedy on the western side but the eastern side had clear sand flats, where prawning was done. Also sand whiting and bream could be caught in reasonable quantities for 9 months of the year. These would be caught by hauling nets. The Middle Lake, now known as Budgewoi, was a very weedy lake where luderick and mullet was available during the same months as the main lake. (Arthur Clouten)

Meshing fish in the 40s and 50s

As was permitted in the 40s and 50s, a person was licensed to have 400 yards of mesh net for private use. My father, George Browne, had 400 yards of the then cotton mesh net, using it to mesh fish for his own use. I was often involved in 'bull-ringing' schools of big mullet during the day, fish so big they would not mesh. A mate and I regularly went overboard to grab these big fish, wrapping them in the net when they hit it, then holding them until we could get our fingers into their gills then place them in the boat. Bully mullet weighing as much as 6lb were fairly common. Also Dad often meshed of a night mainly to get other fish species, such as bream and blackfish (luderick). (Gordon Browne)

Changes in fishing

Generally the fish numbers have to decline. It is going to decline just from the increased fishing pressure. They have better gear, better boats, and you also have the pressure from recreational fishing. In the 1920s and 1930s, as far as recreational fishing was concerned, you would have a peak in the summer, and another at Easter and that was it. Now you have pressure every weekend and sometimes through the week also. They did an experiment in Lake Macquarie and found out that the recreational fishermen were taking more fish than the commercial fishermen. I suppose with all the pressure on the fish sooner or later they will have to do what they have done for the tuna and lots of other fish, and go onto quotas. This year has been really bad along the whole coast for mullet, presumably because the breeding stock have been taken. They will have to do something about maintaining the breeding stocks of all species. The same is happening with the prawns. (Peter Clifford)



Fishing

Tuggerah Lakes have been a popular commercial and recreational fishing venue for more than a century. Not only have they been one of the most important producers of estuarine fish in NSW, but have attract many tourists to the area each year.

Recreational fishermen have reported a decline in fish stocks over the last 20 to 30 years. Commercial fishermen on the other hand, have mixed feelings, some agreeing that there has been a decline but that it has probably been a coast wide effect rather than just Tuggerah Lakes. Some believe the fluctuations are part of a long term natural cycle.

Some of the earliest historical records of Tuggerah Lakes include descriptions of an abundance of fish. In 1842, John Mann observed a large canoe-full of fish at an Aboriginal corroboree on the edge of the lake. The abundance of fish attracted a group of Chinese fishermen to Canton Beach in the 1860s. In the 1880s professional fisherman from the South Coast set up camp at Saltwater Creek and Canton Beach.

After the opening of the railway most of the fisherman moved to Tacoma on the western side of Tuggerah Lake to gain easy access to Wyong Railway Station and hence the Sydney Fish Markets.

Fishing through the early 1900s was plentiful. Most commercial fisherman and recreational fisherman reported good catches of fish during the 1950s and 1960s, although considerable fluctuation occurred from year to year. Arthur Clouten, a professional fisherman, reported increased weed growth and shell life throughout the 1950s after a period in the 1940s when there had been very little. This provided good habitat for the fish and some large catches were reported. By the early 1960s the weed growth was extensive, particularly stackweed in the southern part of Tuggerah Lake and the centre of Budgewoi Lake and there were some reports of slime (macroalgae) starting to appear.

Recreational fishermen have reported a long term decline in fish abundance over the last 20 to 30 years. Many professional fishermen however, believe that the recent decline in numbers might be part of a continuing cycle, and they report that similar declines have occurred before.



What people appreciated about the lakes:

Results from Community Surveys on Tuggerah Lakes taken from the Education and Communications Strategy in 2008.

"The beauty and serenity of the lakes. Respondents stated that it was a nice and peaceful place in which to relax."

"I go early in the morning and the sunrise is a treat. I like the natural beauty..."

"Not just the recreation but the aesthetic value; large open space in the middle of the shire, it is quite lovely."

"The sunsets are fabulous."

"The activities and facilities that one can partake in around the area – activities mentioned included fishing and prawning, canoeing, sailing, skiing, golf and bike riding. The walking tracks in particular were mentioned."

"It's good for the kids; being an outdoor activity that doesn't cost anything."

"The fact you can walk around most of it; so far along the edge of the lake. The pathways around are terrific."

"I love the water. I love to sit there and gaze upon it."

"They are just great lakes; it is good to be surrounded by water."

"I like the view and the water."

"There is wildlife around. There are platypuses up the river. People can still fish and pull out a decent size. There are also lots of birds."

"However a number of respondents noted that the lakes have deteriorated and were in poor condition. "

"A very beautiful area but sometimes it smells."

"I would appreciate it if it was clean, we don't go down there mainly for that reason."



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