Coorong & Lower Lakes

Talking fish

Making connections with the rivers of the Murray-Darling Basin

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Aboriginal readers are warned that this publication may contain the names and images of Aboriginal people who have since passed away.

The rivers of the Murray-Darling Basin

The rivers and creeks of the Murray-Darling Basin flow through Queensland, New South Wales, the Australian Capital Territory, Victoria and South Australia. The 77 000km of waterways that make up the Basin link 23 catchments over an area of 1 million km^2.

Each river has its own character yet these waters, the fish, the plants, and the people that rely on them are all different.

The booklets in this series are about how the rivers, fish and fishing have changed. The main stories are written from oral history interviews conducted with local fishers in 2010-11, and relate individuals' memories of how their local places have changed. They showcase three ways of knowing the Coorong and Lower Lakes: personal experience, scientific research and historical research. Just as individual fishers do not always agree with one another, so their understanding might not necessarily agree with current scientific information or historical records. Similarly, specific items and events might be remembered differently by different people. These varied perspectives show the range in views about fishing and the rivers, each important in its own way. There are many other great stories out there about fishing in the Murray-Darling Basin. These booklets are just the beginning.

Acknowledgements - Coorong and Lower Lakes

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Source: Garry Hera-Singh.

Source: Jodi Frawley.

Source: Garry Hera-Singh.

Source: Jodi Frawley.

Back page fish images

All fish images except congolli: NSW DPI. Congolli image: Gunther Schmida.

And my grandfather used to tell me about the ***weeds*** *growing in the river, and they'd watch that. And a* ***big fish*** *would come in there and of course you could see the movement. When he's feeding, the* ***Murray cod****'s tail would always come to the top. I've seen it myself – the tail,* ***the big tail****.*

Ngarrindjeri woman Annie Koolmatrie, born 1917, recorded in 1979 by Bonita Ely[1]

After gathering water from 23 river valleys, the Murray empties into Lakes Alexandrina and Albert before making its way to the Coorong and out the Murray Mouth to Encounter Bay in South Australia. The entire Murray-Darling Basin is upstream. Everything that happens there affects what goes on here.

Wind is almost a constant here. Nothing separates this unique piece of Australia from Antarctica and the full brunt of the Southern Ocean. The River, Lakes and Coorong are part of the traditional lands of the Ngarrindjeri people. These waters provided food and featured in their stories. The Ngarrindjeri people have seen their land and river change.

As well as being uniquely affected by changes upstream, the Lower Lakes, Coorong and their fish have been shaped by the people who came to live here and of the industries that developed. Sheep and cattle grazing, commercial fishing and tourism have all brought new people into the area, with new needs and new ways to catch its fish. The Lower Lakes and the Coorong once formed one big estuary where fresh and saltwater mixed. The Lakes only became salty during droughts. Now, barrages separate the freshwater from the salt and the Lakes from the Coorong. Flows from upstream have declined so much that in recent years a dredge has been used to keep the Murray Mouth open to the sea.

These changes mean there are a lot less fish than there were. Before the turn of the twentieth century, there are many stories of catching Murray cod, catfish, silver perch and yellowbelly. There were no carp and no redfin.

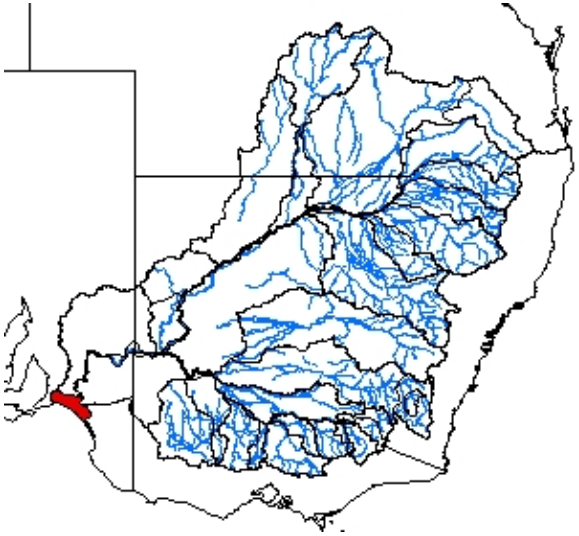
There are still those who love the Coorong and the Lower Lakes and who love to fish them. Their stories are part of the bigger story of change. They help us remember that what we see now is not how it used to be. People want to talk about a future for the Coorong and Lower Lakes and their visions for a healthy system that is, once again, full of fish.

Introducing the river and its people

Yarluwar-Ruwe: Sea Country

The *Ngarrindjeri Nation Yarluwar-Ruwe Plan* retells how the Lower Lakes and Coorong were created by Ngurunderi and Pondi, who came from the upper reaches of the Murray River.

> *A long, long time ago Ngurunderi our Spiritual Ancestor chased Pondi, the giant Murray cod, from the junction where the Darling and Murrundi (River Murray) meet. Back then the River Murray was just a small stream and Pondi had nowhere to go. As Ngurunderi chased him in his bark canoe he went ploughing and crashing through the land and his huge body and tail created the mighty River Murray. When Ngurunderi and his brother-in-law Nepele caught Pondi at the place where the fresh and salt water meet they cut him up into many pieces, which became the fresh and salt-water fish for the Ngarrindjeri people. To the last piece Ngurunderi said 'you keep being Pondi' (Murray cod).*[2]



The coming of the Europeans

The Lower Lakes and Coorong that Charles Sturt found when he completed his journey down the Murray River to the mouth in 1830 was a tidal place where both salt and fresh water fish could be found. The Lakes' shores provided good watering points for the sheep and cattle that followed in the 1840s.

Ngarrindjeri people worked in these pastoral activities, sharing their intimate knowledge of the Lower Lakes and Coorong with the newcomers. Fishing in the salt, estuarine and fresh water yielded a range of different fish for all to enjoy.

A commercial fisher on the Coorong. Photo source: Garry Hera-Singh (Photo notes *Courtesy of Tony Gardner*).

In 1853 the *SS Mary Ann* and *SS Lady Augusta* kicked off the steam and paddle boat travel on the Murray and Darling Rivers, making Goolwa a key inland rivers port. Professional fishermen worked the Lower Lakes and Coorong, moving between campsites dotted around the shores and the satellite towns of Milang and Goolwa. Professional fishing numbers swelled when other work in the area dropped, especially during the depression years of the 1890s and 1930s.[3]

River regulation in Victoria and New South Wales meant that by the early twentieth century the Lower Lakes were saltier than they had been in the past. Five barrages were built at Goolwa, Mundoo, Boundary Creek, Ewe Island and Tauwitchere by 1940, changing the Lower Lakes again. The Lakes were now permanent fresh water.[4]

Today the pulsing of the fresh and salt water has been ended by the barrages. Continued low flows from upstream have meant the southern end of the Coorong has become up to five times saltier than the sea and is at risk of ecological collapse. Once a place where both salt and fresh water fish moved with the different waters as they flowed backwards and forwards through the system, the fish are now struggling to cope.

The Murray Mouth – where the Murray-Darling Basin meets the sea. Photo: Jodi Frawley.

Brian Schulz got to love the River Murray and its fishing from family holidays when he was a child. So, he moved to Murray Bridge! Photo source: Brian Schulz.

Terry Sim (left) and **John Yelland** (right) were born within three days of one another. As youngsters, they explored the banks of Lake Alexandrina and have continued this love of the wild as adults. Photo sources: Terry Sim and John Yelland.

Tracy Hill is an active member of the Southern Fishers Association. She is proud that the commercial fishery operating in the Coorong and Lower Lakes is recognized as a sustainable fishery. Photo: Jodi Frawley.

Brian Schulz – *The original 'Fantastic Fisherama'*

Brian Schulz was born 74 years ago and grew up in the Barossa Valley. His family ventured across to the Swan Reach on the Murray River where they holidayed in a shack near Lang's Landing.

Fantastic fisherama

Brian so loved his fishing that he moved to Murray Bridge to be closer to all the best spots in the river. He was enthusiastic about getting people together and spreading the word about recreational fishing.

I used to run a fishing competition called Fantastic Fisherama and that was a very, very popular fishing competition. We had up to 790 contestants at Walker's Flat one year back in the '70s. We went up to Big Bend in later years, and that's a lovely place up there. Always good fishing.

All sorts of fish

Brian has caught all sorts of fish from the river over his life time: callop, silver perch, catfish and carp. But he has seen some fish disappear from the angler's repertoire – for better and for worse. Tench, another fish introduced from Europe, is one example.

We used to have tench years ago. Sometimes they would be up to three or four pound. We didn't eat them though, they were too bony. But they have died out since the carp came in and took over.

Cod story

Brian's all-time favourite fish is the Murray cod.

They're so beautiful, they're so docile, they're such a marvellous species of fish. I don't believe in slaughtering them or killing them. We had commercial fishing in South Australia until a few years ago. We had a big petition drawn up and collected something like 28 000 signatures and we took them to parliament through Mr Peter Lewis and eventually the commercial sector in the Murray River was closed. I think recreational fishers also need to stop catching cod. I'm against lure fishing for Murray cod. I feel, don't target 'em, leave 'em alone.

Recently the South Australian government has moved to a catch and release policy for Murray cod, where they must be returned to the water.

Murray cod

(*Maccullochella peeli* – Cod, Codfish, Pondi)

Photo: Gunther Schmida.

- Largest Australian native freshwater fish, growing to 1.8m and 113kg (average 40cm)
- Found around deep holes, woody debris ('snags') and overhanging vegetation or rocks
- Ambush predator eating other fish, crustaceans, molluscs and frogs
- Migrate in Spring – often migrate hundreds of kilometres upstream with water level rises
- Males guard the eggs which are laid on logs or rocks
- Listed as 'Vulnerable' in Victoria and by the Commonwealth, catch and release only in SA

Photo: Luke Pearce.

Across the Murray-Darling Basin, fishers talk of a story about the map of the cod's birthplace imprinted on their stomach lining. Brian heard this story from an Aboriginal man he knew, Mr Hunter.

Like most fishers, he was skeptical. So he set out to find some proof, one way or the other.

I caught a cod, gutted it and cut open the stomach. When I saw the lining of the stomach, I held it up to the light and there was the tree in front of me. There are hundreds of trees in the Murray but this particular tree has got a particular lean on it, so I recognised it. A lot of people today don't believe me. But that doesn't bother me. I know the truth, I've got it there in writing. You can't do any more than that.

Tall tales and true

They catch some big fish at the bottom of the Murray system, Brian explains.

I was fishing and I had this huge bite and I started to reel it in and another fish came along and took the fish that I was reeling in. And then I started to reel that other fish in and he's hangin' on to the first fish and another fish came along and took the back fish, so I had three fish on the one hook. And just got them all to the boat and the cord broke and I lost the lot!

The stomach lining of a Murray cod showing Brian where the fish he caught was born. Source: Brian Schulz.

Salt in the fresh

Brian lives approximately 60 kilometres from Lake Alexandrina and has witnessed the problems of the Lower Lakes and the Coorong since the mouth of the River first closed in 1981. While he acknowledges that there are problems with hypersalinity in the Coorong, he also thinks fishers need to know about the salt in the River itself and how it affects what is happening downstream.

There is a lot of salt on the cliffs in this part of the Murray. The river gets salty because of the irrigation that's coming from the cliffs. Over time the water seeps back down into the river. It becomes very saline downstream.

Big fish and lots of fish. Top: a catch that included a large mullaway. Photo source: Garry Hera-Singh (Photo notes *Courtesy of Tony Gardner)*.

James Carruthers with his grandson Des netting congolli in Narrung Narrows in 1940. Photo source: Garry Hera-Singh (Photo notes *Courtesy of. D and J Ayres*).

They've opened up the Barrages at Goolwa at the moment and a lot of that salt's gone out of the mouth. It's good it's washed out.

John Yelland also worries about the accumulation of salt from upstream water use and farming practices.

One of the things you certainly can't argue against in the Guide to the Proposed Basin Plan is the estimated two million tonnes of salt per year washing into the river. Where is it going? It has to go out to sea otherwise it's just going to fill the river up. I think everybody understands we need to deal with the salt.

One of the paradoxes of the Lakes, says John, is that they are freshwater with saline swamps all around them, fed partly from the salt deposited by past flooding.

The Murray Mouth in April 1981. It was completely silted up, effectively separating the immense Murray-Darling River system from the ocean. Image source: Garry Hera-Singh.

Henry Jones is a professional fisher who lives at Clayton on Lake Alexandrina. He thinks that the lack of flows are related not just to the drought, but also to the lack of freshes that would have helped to clear the salt in the past.

The big floods rarely happen now. I think '92 was the last one around this way, but we never get those intermediate ones anymore. Those little floods. They're pumped into dams and used for irrigation or critical human needs. Unless we can get those medium flows to flush the salt out through the sea, then this area will continue to die. I mean we can see it dying.

Salt interception schemes

Rising salinity is an issue throughout the Basin.

One option being used to address increases in salinity is Salt Interception Schemes (SIS). SIS use bores to capture saline groundwater and pump it to disposal basins before it reaches the river channel. Disposal basins are a large distance from the river and minimise the potential for salts to re-enter the surface waters.

The first SIS was built at Curlwaa in NSW in 1973. Sites in SA include Waikerie, Woolpunda and Loxton, Bookpurnong, Pike River, Murtho, and Chowilla.

At Morgan, the level of salinity is now about 25% less than it would have been without the schemes.[12]

For more information on this and other options being used to control the Basin's salinity see www.mdba.gov.au.

The barrages

European settlement of the Murray-Darling Basin has altered the Coorong and Lower Lakes. Before settlement the Lakes were predominantly fresh, but during periods of low flow they are believed to have become brackish for short periods as seawater intruded into the Lakes.

As settlement expanded locally and across the Basin, land use changed and extractions increased. The intrusion of seawater became a greater issue such that by the early 1900s the increasingly salinity made it more difficult for locals to utilise the lake water.

By 1940 five barrages were built: Goolwa, Mundoo, Boundary Creek, Ewe Island and Tauwitchere - forever changing the connectivity, hydrology and ecology of the area.

The construction of the barrages in the 1930s was welcome work for many men. Fishing was important both to supply food and to take back to Adelaide and sell on their work breaks. Photo source: Garry Hera-Singh (Photo notes *Courtesy of Leta Packman).*

Barrages and fish

For fish the construction and historical operation of the barrages has created a series of problems:

- the change from fresh to saltwater is abrupt
- fish can't move around the system at will to find food, refuge, migrate or spawn
- water levels have been more highly regulated

The barrages prevent sea water entering the Lakes and River. During times of flow, the barrages are opened to pass inflows, allowing fish and freshwater to reach the Coorong and sea. Stable water levels have created conditions suitable for introduced species like carp and redfin.

Under drought conditions water regulation and extraction for human use upstream mean the barrages are kept closed, preventing the movement of fish, nutrients and food materials to the Coorong. This is thought to be one of the major factors that has degraded habitats and caused declines in fish populations of the region.

To overcome some negative impacts of the barrages Lake water levels are now operated with greater variability and allocations of environmental water are improving the Lakes Coorong connection. Fishways have also been installed in the Goolwa and Tauwitchere barrages and more are proposed.

Studies at Tauwitchere have indicated more than 30 fish species will use the fishways and millions of fish are likely to use them in a single year![5]

Reeds like these on the banks of the Murray further upstream, used to be a common sight on the edges of the Lower Lakes. Photo: Malcolm Wilksch.

The barrages are significant barriers to the natural mixing of salt and fresh water and to the movement of fish to find food and for spawning. Photo source: Garry Hera-Singh (Photo notes *Courtesy of Peter Gibbs*).

Local reeds for Ngarrindjeri weaving

Ngarrindjeri women and children have always harvested the reeds from the edges of Lake Alexandrina and Lake Albert.

The historical records show the same techniques which Ngarrindjeri women use today: a range of different types of weaving to create baskets, string bags and nets for fishing.

These are made by weft-twining, knotting and coiled baskets methods. Reeds are stripped and then dried, and could be softened by chewing or woven green as a communal activity on the shores of the Lakes. Like fishing, weaving has always been an opportunity to gather for storytelling.

Once complete, woven items trapped fish, acted as keeper nets and were used to store fish as they were carried from the water to the campsite.

Baskets and other hand woven artefacts became items for sale to curious immigrants and tourists – providing important income streams from a traditional and time-honoured practice.

Ngarrindjeri women are internationally recognized for their creativity in design and weaving skills. Women share their skills at weaving workshops that are regularly held at Camp Coorong.

Terry Sim & John Yelland – *Mates on the Lakes*

Terry Sim (left) and John Yelland (right) were born within three days of one another in 1952. They were destined to be mates, although Terry grew up in Milang and John on Point Sturt. John's family owned a mixed farm that included a small dairy, and Terry's father did the milk can run every morning from the local farms to the butter factory at Milang.

As youngsters, they both explored the banks of Lake Alexandrina, fishing, picnicking, and searching for wildlife along the wind swept shores. Nowadays they continue to explore the area as members of the community group, the Lakes Hub.

Although there was plenty of water, John explains fishing was a challenge when he was a young boy.

Our part of the lake, the corner down at Point Sturt is very shallow. When the water was out recently, it was nearly two kilometres out and it shows it is a lot of flats. So fishing there wasn't very good. Uncle Graham next door, he and his brother were keen fishermen. John particularly was keen. They had a decent sort of boat and outboard motor there for a while.

Yabbies and magic

Terry's family loved to yabby. And when they did, more than the family tucked in at the end of the day.

Everyone yabbied. If you wanted a feed of yabbies you went out and got your own. And you'd get enough yabbies to do a couple of copper-fulls. Coppers were used for boiling water that clothes were washed in. And at home we had a pergola that was covered in grape vine. The table would come out under the grapevine and the copper would start up for the yabbies. As a six or seven year old kid it was almost like magic because people just used to turn up. You didn't know how they got there but the gate would open and a couple of cousins and an aunt would come in. By the end of the day there'd be 15 or 20 people sitting around the table all eating yabbies.

Yabby

(*Cherax destructor*)

Photo: Charlie Carruthers.

- Seldom over 250g
- Widely distributed in SE Australia
- Found in ponds, billabongs and slow flowing streams
- More active in the warmer months, less active when water temperatures are below 14°C
- Breed from September to March
- Fast growing: can reach 50g in first year
- Grow for 6-7 years
- Reduction of backwaters, floodplains and billabongs are thought to be their biggest threat. Overfishing has led to localised losses
- A commercial yabby fishery operated in Lake Alexandrina from 1970-75
- In 1972 and 1973, in excess of 100 000kg per year of yabbies were removed – this equates to about 2 million yabbies per year
- The yabby population in the Lake has not returned to the high levels of the 1970s[10]

Acid sulfate soils

Over the millenia, the sediments of the Lower Lakes have developed iron sulfide minerals from natural organic carbon and sulfate in an oxygen-free environment. With a decline in water levels, these materials are exposed to air, oxidise and form sulfates. When re-wetted, sulfuric acid is produced and toxic metals such as aluminium may be released.

In March 2009, when the water levels were very low (-1.4m AHD (mean sea level) or more than 2m below normal lake level) some 20 000ha of these sediments were exposed around the lakes. Potential acidification of the whole Lakes system was feared.

Most aquatic life needs a minimum pH of 6 to survive, but acidified water can be as low as pH 2, although it is often around pH 4. Fish and other creatures will try to avoid acid water, but if they can't, fish kills may occur. Acid water can have other negative effects to fish like damaging their skin, reducing their growth and reducing the ability of fish eggs to hatch. Acid water is also high in aluminium which is toxic to most fish, damaging their gills and leading to suffocation.[8]

Luckily, only small areas of shoreline showed serious acidification. Some aerial spreading of fine limestone was used to assist with neutralising these areas. Other areas were deliberately kept inundated with water following the construction of earth 'regulators' at Clayton and Narrung. As a result the waters remained greater than pH 7 and no fish kills were observed.

With much interest focused on the area, a Milang community initiative, the Lakes Hub, was formed to connect Government with enthusiastic and committed local groups. Community and agency monitoring and bio-remediation programs are ongoing.[13]

Acres of ducks

Terry knows that the wildlife in the Lakes was once measured differently than it is now.

I've talked to the grandson of one of the families who were professional duck shooters. And the ducks were on the lake in huge rafts. They didn't count the ducks in 200 or 300, they said, there's four or five acres of duck. That's how big the mobs were.

Terry and John explained how the abundance of birdlife also tells a story of Lakes thriving with the sort of feed that was also great for the fish.

Originally the Lakes were fresh, and in some places the ribbon weed, Triglochin, was two miles into the water. Then on the shore there were reeds, and then there were swamps and lignums behind them on the plains. And that water reed was where the invertebrates lived. The old fishermen and duck shooters say that there was a tiny little snail that lived in the water weed. I think they're more like a cockle or mussel than a snail. When the water weed was killed off by the sea water intrusions, that little snail died and then the ducks disappeared.

Little things lost

Henry Jones came to Clayton on Lake Alexandrina in the 1960s. He agrees with Terry and John that the devastation of the small animals in the system has effects for all the animals.

Little things like spiral snails. The swans used to live on them, and the musk ducks and the blue billed ducks, and the widgeon, the grebes. All those diving ducks. I used to throw an anchor in the water for ten minutes and pull it up and it was just covered in these snails. They're not there anymore.

Historically, about 18 species of snails lived in the River Murray in South Australia but natural populations of nearly all of these have declined.

Source NSW DPI.

Notopala sublineata hanleyi, was thought to be extinct in South Australia until it was discovered in irrigation pipelines in the Riverland region.

Notopala spp. produce 'miniature adult' babies and so require high protein, low carbon diets. River regulation is thought to have encouraged carbon rich algae in stable weir pools, meaning these snails don't get enough of the right food.[11]

Terry thinks that the changes to the Lakes reach back into the nineteenth century – when non-Aboriginal people first settled in South Australia.

There was an inspector of fisheries in the late 1800s who wrote a report to say that the Coorong was going saltier than it was before. He also detailed how black bream, which were a major fish in the past, had almost disappeared and the mullet were taking over. So, even as early as 50 years after settlement things had seemed to change down the Coorong. With the salt water coming into the Lakes more and more, the cod and the callop disappeared back up stream and the mullet and the mulloway came in from the sea.

Prior to their construction the barrages were seen as the solution to the problem of increasing salinity. A Letter to the Editor of *The Advertiser* (Adelaide, 31 May 1915) states:

> *What is the position to-day? The lakes have been lower throughout the year than at any period known to white men … . [T]he encroachment of the sea water has gradually increased. It culminated in the storm … [which] drove the water back, and allowed the inrush of sea water … . One of its effects was to destroy in Lake Albert one of the finest spawning grounds for cod in this State. … A barrage would have prevented this ….*

Mulloway for isinglass

Mulloway, a saltwater fish, has always been a popular fish for both professional and recreational fishers. It is also a favourite of the Ngarrindjeri people. Terry points out that in the early days not all fish were caught because they were good to eat. The dried swim bladders of some fish were used as isinglass, a type of gelatine and clarifying agent used in beer and winemaking.

Originally the mulloway industry wasn't for flesh at all. It was for isinglass. They took what they needed and chucked the rest of the fish away. I've met many local people who say that there's no wonder there's no mulloway down there now because we used to see great heaps of them on the shore rotting because they just caught them and threw them away.

Fish piled up after a big catch.
Photo source: Garry Hera-Singh.

Mulloway

(*Argyosomus hololepidotus*, jewel fish, jewie, butterfish)

Image: NSW DPI.

- Found in Africa, Madagascar and along the southern coastline of Australia from Shark Bay in WA to north of Brisbane in Qld
- Opportunistic predators, feeding on a variety of fish, molluscs and crustaceans
- Generally spawn in marine waters just outside of the surf zone. Egg and larval development occurs at sea
- Juveniles settle in estuarine nursery areas for three to four years
- Thought to live for a maximum of around 30 years
- Popular recreational species
- Some captured from freshwater of Lower Lakes
- Large mulloway fishery existed in the Lakes prior to barrage construction in 1940s
- Still the basis of a small commercial fishery in the Coorong Lagoon, but impacted by the presence of the barrages

Tracy Hill – *A low-tech, low-impact fishery*

Tracy was born in 1962, and initially worked in Meningie at the 'Bank of South Australia'. There she met Glenn, who had grown up in Melbourne. In the mid '80s he was working his way around Australia, doing whatever work he could pick up. He came to Meningie and befriended a professional fisherman. After going out one night as his deckhand he was hooked.

Instinct for fishing

Tracy and Glenn have since married and she is now his business partner.

> *He bought his licence in 1990. As far as older pro- fishermen are concerned, he's a new kid on the block.*

Glenn fishes at night, setting his fifty metre nets according to conditions at the time. He has learnt to understand the wind and waves, the weather, and how to find the right nook or cranny in the many places in watery areas around Meningie. He says.

> *You really need to think: cave man. You're really acting with nature, and there are no human rules if you're working with nature, and remember, this isn't like a farmer who's got a fence around a paddock, and he's cleared the land, and he's planted this and done that. We have absolutely nothing but nature to work with. And that process is a much more base instinct than anything else.*

Since starting, Tracy and Glenn have built the business up and now employ a fulltime deckhand for the boat and six people in their Coorong mullet processing rooms behind the house.

Glenn Hill running big mesh nets in the Coorong.
Photo source: Garry Hera-Singh (Photo notes *Courtesy of Glenn and Tracy Hill*).

Boats for fish and fishing

The Lower Lakes, with their highly variable and unpredictable conditions, present a challenge for fishers using boats. The centre of Lake Alexandrina is classified as open-ocean, where howling winds from the Southern Ocean can whip up monster waves.

In the early 1900s Lakes fishers usually had one larger 18ft sail boat - one fourth or one-third decked forward. This boat carried them from home base in Milang or Goolwa, across the Lakes to mid-week camps. In 1907 one observer noted: *The men who go hooking are nearly all family men – good fearless boatmen*.[6]

Ngarrindjeri people often worked with the fishers at campsites. Smaller boats, dinghies or flatties were used to manoeuvre around the shores and swamps setting seine, gill and drum nets.

Boats made the run home on Saturday to meet the rail for market, and fishers spent Sundays with their families.

Sailing boats were eventually fitted with motors from the 1950s.[7]

Photo source: Garry Hera-Singh.

Hard times for flounder

Tracy laments the changes in the southern lagoon of the Coorong, which is now hypersaline (up to five times saltier than the sea) and at risk of ecological collapse.

They used to get two hundred tonne of flounder out of the southern lagoon. And hundreds of tonnes of bream. Back in the seventies, early eighties, there's guys who've paid for their whole freezers and processing plants with the money from the flounder in the southern lagoon.

Garry Hera-Singh's maternal ancestors started whaling in Victor Harbour 1854-60, while his paternal forebears fished the Lower Lakes from 1900. Garry continues the family tradition as a commercial fisher but worries about the changes.

It's different for the species that are marine dominant, in other words, they live in the ocean, they grow and reproduce in the ocean and don't rely on the Coorong particularly. If the Coorong were to disappear tomorrow then those species will still continue. But the estuarine dependent species, the black bream and the green back flounder, the congolli, they're all doomed. They're in very, very low numbers.

Wind brings food for fish

'Wind seiching' is the movement of water by wind energy. Wind is a major driver of water movement in the Coorong and Lower Lakes. Water levels between Lock and Weir 1 near Blanchetown and Wellington vary by up to 50cm daily due to this effect.

Wind sieching is important for keeping the Coorong, Lower Lakes and Murray Mouth healthy. This effect is believed to increase oxygen levels in the water and distributes nutrients used by plants and animals, in particular fish, for food.

Wind seiching also plays a part in flood irrigating the foreshore of the Lower Lakes, encouraging plant growth through late summer.

The Lake foreshore, such as seen here near Milang, benefits from wind generated watering in hot weather. Photo: Jodi Frawley.

Tracy explains how the changes in the flow from water use, sometimes thousands of kilometres away, show up in the numbers of fish at the end of the system.

Because of the lack of flows there's been no real breeding events, except in some isolated little areas where there is fresh water coming out of the sand hills. We'd get to a spot with our mullet net and we'd get all these little fifty cent size flounders. And you know they've bred, but trouble is, they're not reaching maturity. We also notice that when the water from the southern lagoon comes up into the northern lagoon you'll get dead flounder. They can't swim very fast so the hypersaline water can overtake them – if it's deoxygenated water, they'll just turn their toes up and die.

A sustainable professional fishery

Tracy has become an active member of the Southern Fishermen's Association. She is very proud that this Fishery has undergone restructuring. The Hills hold one of only 36 remaining licenses. They have also participated in an audit carried out under the rules of the Marine Stewardship Council.

As a result they are internationally recognised as a sustainable fishery.

Marine Stewardship Council endorsement is the highest environmental standard for fisheries in the world, and we've got it. We were the third fishery in Australia after the Western Australia rock lobster and the Macquarie Island ice fishery, which operates down in the Antarctic. The MSC certification as a sustainable fishery is for our four main species: golden perch, mulloway, pippies and mullet.

Mullet, one of the fish that the Hills are certified for as a sustainable fishery. Photo: Jodi Frawley.

One of the first

One of Tracy's professional colleagues, Garry Hera-Singh, thinks this certification partly comes down to the practices that have been in place for generations of fishers in the Coorong and Lower Lakes.

In my grandfather's day, all those guys recognised that what we did was sustainable. This fishery was the first to put out an environmental management plan for a commercial fishery in the world. We completed that in 1998. And then the conservation groups got interested in what we we're doing and World Wide Fund for Nature, which has a sustainable fishery section in it, were interested in what we were doing and they co-sponsored us in to getting a certification process. So it was just another way of telling the rest of the world that hey, it's not over-fished and rundown because of the pro-fishers.

Another professional fisherman, Henry Jones, explains why it is so important to balance caring for the environment with best practices in business.

I realised many years ago that if we weren't sustainable then the public wouldn't put up with us. They'd get rid of us, so I think that is probably why we're the last commercial fishermen on the river, because we've done all this work.

Congolli

(*Pseudaphritis urvillii* – tupong, sandy)

Photo: Gunther Schmida.

- Small to medium sized fish, maximum 35cm, that lives 3-5 years in the Murray-Darling Basin
- Found with logs, rocks or overhanging banks. Its eye placement on top of its head allows it to be partially buried in leaf litter or sand
- Moves between freshwater and sea water as part of their life cycle
- Known to migrate up to 215km in lower Murray (but uncommon upstream of Wellington)
- Spawn in winter and early spring. Females reside in freshwater and males in the estuary. Both appear to move to marine environments to spawn
- Large upstream migrations of juveniles from ocean / estuary to freshwater in summer
- Eats small fish, aquatic insect larvae, small crustaceans, snails and worms
- Threats include barriers to movement and declining river flows

Making connections

Different communities - different connections

Ngarrindjeri man, Jack Koolmatrie was born in the 1910s on the Coorong. In 1980, he told Bonita Ely about the ways he had got about the Coorong:

> *We used to ramble all over the Coorong and down the Coorong on foot, right from the Murray mouth down to Kingston. And then I done it with the boat; then I travelled down on the push bike, and horse. And then I got a bit well off; I travelled down there from Kingston and back to Rabbit Island in a Ford T across the Coorong.*[1]

Being part of a fishing community is also important to Tracy Hill. She sits on the Southern Fisher's Association, and has worked with other fishing businesses and families to raise the profile of their fishery. She is also an advocate for the place of women in the fishing industry.

> *A group of women in the wild catch industry formed the Women's Industry Network. We were the ones that were under attack all the time from the public.*

> *There were people from over the west coast, people from down the south east, people in the north of Adelaide and the blue crab people. We had quite a few groups and we mobilised the women in this area to raise the profile of fishing.*

Women are important to the success of fishing activities in both Aboriginal and European traditions. Bethel Goldfinch, pictured here in the late 1940s, was one of the Coorong fishers who worked alongside her husband Reg, travelling in their caravan to wherever the fish were. Photo source: Gerry Hera-Singh (Photo notes Courtesy of D and J Ayres).

Another group of people that are making connections with the Coorong and Lower Lakes are those interested in the environment, especially from a scientific perspective.

John Yelland and Terry Sim have been involved with the Strathalbyn Naturalists' Club, the River, Lakes and Coorong Action Group Inc. and the Lakes Hub. John explains the importance of the way the group works with scientists from the South Australian Museum and other agencies and universities.

> *The Strath naturalist group was really incredibly valuable for the area because it brought people together who were interested in the environment from around the whole region. My mum was one of the early members. It also brought in experts and suddenly, you have a crossover of specialist and local knowledge, which is fantastic.*

A productive day fishing at Point Sturt on Lake Alexandrina in about 1958. Photo: Graham Yelland (Source: John Yelland).

A composite photo showing the expanse of water at Lake Alexandrina – the Murray mouth is out there somewhere. Photos: Jodi Frawley.

Ngarrindjeri flag

The Ngarrindjeri flag was first flown on 21st November 1999 at Kumarangk (Hindmarsh Island).

The dots represent the eighteen Lakkinyeris of the Nation who are all called to Tendi by the scared boomerang. The traditional spears used for fishing take pride of place in the design with the waters of the Coorong, Lower Lakes and Southern Ocean all represented in blue. The sun, central to all life in Ngarrindjeri Country, is a central motif of the design.

The flag flies permanently at Camp Coorong near Meningie.

Belonging

Jack Koolmatrie saw many changes in the Coorong and the Lower Lakes over his lifetime. When he talked to Leigh Hobba in 1980, he remembered the way that his great grandfather would travel up the Darling River as far as Wilcannia looking for work and meeting up with other Aboriginal people along the way. But the Coorong was always a special place.

That was the tradition – they weren't lazy like some people think they were. My great grandfather, he got out early in the morning, and he'd rejoice and he would sing his language and dance – a great dancer he was – just to bring the new day for him. He was happy all day.

Clayton

In 1910 the Surveyor General of South Australia laid out the township which was to be gazetted as Clayton. It was hoped that it would become another thriving foreshore community like Milang, 30kms around on Lake Alexandrina.

That didn't happen until professional fishers Henry and Gloria Jones arrived in the 1960s, joining the only other resident – a man living in a cave with 20 cats. Henry and Gloria built a house and then a little shop where they sold fresh fish caught out on the Lakes. In 1974, they opened a restaurant and deli that they called Yabby City, selling their fishing hauls direct to the public.

The little town grew around them, becoming a drawcard for tourists. Henry remembers: It was a really busy little restaurant for 25 years. *We had coaches, boats and helicopters bringing people in: the whole works!*

Visions for the Coorong and Lower Lakes

The fishing people who contributed to this project have all talked about their hopes for the future of the river. Many felt they had seen some improvements but most don't feel the river is as healthy yet as they would like to see it. Each of these fishers suggested ways to help the river and in turn help provide healthy habitats for fish.

The little things ...

Henry Jones is a member of the Community Stakeholder Taskforce for the Murray-Darling Basin Native Fish Strategy. During the drought, Henry observed the way that scientists worked hard to ensure the protection of the smaller fish of the system.

I mean we had scientists going into little pools and taking out the Yarra pygmy perch and Murray hardyheads and putting them into aquariums and trying to keep them alive. When the water comes back they can put them back in and the species will not be lost forever. We've got a whole heap of species here that are unique to this area, and unless we can do things like that, or unless we can fix the Murray-Darling Basin and put some water back in the river and make it sustainable, then they will keep on dying unfortunately.

And the big picture

John Yelland and Terry Sim think that rather than everyone thinking about their own backyard, people should think about the Murray-Darling Basin as a whole. Terry says

We would like to see the river system looked after as a whole system and looked after from the mouth up rather than from upstream down. We can't understand why people upstream can't realise that what's happening here, if it's not fixed, it's a cancer that will move up through the system. There is a fair bit of pain, as far as humans go, especially for irrigation and orchards, but the environment's had the pain for the last 100 years. It's maintaining itself but it's nothing like it used to be. And we've got that little window of opportunity of repairing it. If you've got a healthy working river and it's flowing to the sea, everyone should be happy.

Yarra Pygmy Perch saved from Lake Alexandrina.
Photo: Michael Hammer.

Fish rescue!

During the recent drought, water levels below Lock and Weir 1 dropped to such an extent that wetland and refuge areas for a number of small native species dried up. Quick action by committed volunteers and government agencies ensured the last remaining populations of purple spotted gudgeon, southern pygmy perch, Yarra pygmy perch, Murray hardyhead and river blackfish didn't disappear for good.

Intensive sampling for these fish was carried out at locations where they had been known to occur. As many individuals as possible were collected and transported fish to aquaria where they would be safe.

Since being in captivity, some of these fish have done really well, not only surviving but breeding! Their genetics are being monitored carefully to make sure genetic diversity is maintained.

Now that water levels in the River Murray and Lower Lakes have improved, these fish are able to be released back into the wild.

Special congratulations and thanks should go to the volunteers including individuals, community groups and schools who have cared for these fish during their time in captivity.

For more information contact Native Fish Australia SA: www.nativefishsa.asn.au

Tracy Hill is optimistic for the future – if we can get things right.

> *How about just fixing the environment up, and then it will be there for everybody. Mother Nature does all this stuff for nothing. It uses solar power and wind power and it does it for nothing. Our motto is 'look after the environment and the fish will look after themselves'. And it will respond before your eyes.*

The Murray Mouth – the end of a very large river system which has diverse land uses, regulation and significant degradation. Image source: http://www.thelivingmurray.mdbc.gov.au/__data/page/1482/WALKER_report1.pdf

Fish communities of the area

Fish monitoring at the barrages and island overflow channels in 2007-08 identified up to 33 freshwater, estuarine and marine species.[9]

Monitoring of island channel and lake edge habitats recorded 26 freshwater and estuarine fish species in 2005-07.[14]

The estuarine small-mouthed hardyhead dominated the catch for both these studies, but other fish captured in large numbers included: bony bream, Australian smelt, flathead gudgeon, introduced Eastern gambusia and redfin perch (freshwater) and Tamar river goby, sandy sprat and yellow-eyed mullet (estuarine).[14,9]

Species that move between fresh and saltwater to complete their life cycle (congolli and common galaxias) were also captured in large numbers.[9]

Over the last decade, the extensive drought has resulted in a significant reduction in freshwater flow to the Lower Lakes and Coorong.[15] In the estuary and Coorong, monitoring of black bream and greenback flounder has seen a significant decline in abundance and recruitment.[15]

The lack of inflow also has serious implications for the Endangered Southern pygmy perch, Yarra pygmy perch and Murray hardyhead that rely on the specific habitats found in the island overflow channels and which could be lost if inflows continue to decline[14] occur once again.

The Lower Lakes, Coorong and Murray Mouth are one of the *Icon Sites* of the Murray-Darling Basin. This designation recognises the unique cultural, social and environmental values of this place as well as the unique threats it is facing. The acknowledgement of and respect for cultural heritage values is an important aspect of the area's rehabilitation.
Photos: Jodi Frawley.

Bringing back the fish

A number of local projects aim to bring the fish back to the rivers of the Murray-Darling. These compliment large scale programs such as the MDBA's *Native Fish Strategy* and *The Basin Plan* that continue to work with a wide range of stakeholders to ensure positive outcomes for the environment and fish of the Murray-Darling Basin.

a) Long Term plan for the Coorong and Lower Lakes

In 2009 the Coorong and Lower Lakes Recovery program was developed to address environmental issues facing the region as a result of the drought and to rebuild a healthy ecosystem that can better adapt in the future.

The latest science, as well as traditional and local knowledge, was used to tackle issues like salinity, acid sulfate soils and loss of habitat and develop a long-term plan for the region.

It is hoped this will also help support the local communities and industries that rely on a healthy environment to prosper.

For more information visit www.murrayfutures.sa.gov.au

b) Congolli match making

In July 2010, during the height of the drought, an emergency match making service was initiated to save the congolli population from possible extinction in the Murray-Darling Basin.

Adult congolli are thought to only live for 4-5 years, with the sexes remaining separated for much of the year until females migrate downstream from the Lakes to the Coorong to breed from July-September. By July 2010 record low water levels had disconnected the Lakes and Coorong and separated the male and females for over 3 years.

In August 2010, scientists, natural resource managers and river operators trialled the novel solution of operating the Goolwa barrage boat lock exclusively to assist downstream movement of female congolli into the Coorong.

As a result, for the first time in 4 years, an estimated 20 000 congolli were observed moving through the lock over a 6 week period. Spawning was confirmed in spring/summer 2010 when thousands of 'young of the year' recruits migrated upstream through the barrage fishways.

For more information contact the SA DENR Lower Lakes and Coorong Icon Site Manager on (08) 8463 6800 or Brenton Zampatti at SARDI on (08) 8207 5491.

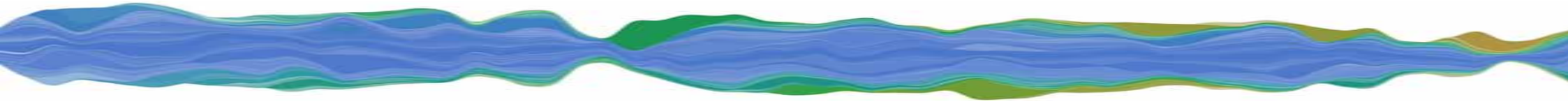
c) The Lakes Hub

The Lakes Hubs were established at Milang and Meningie were an initiative of the local community, through the Milang and District Community Association, as a way of sharing information between government and the community.

They have provided a local base for people to find out about urgent environmental works carried out as part of the Coorong and Lower Lakes Recovery program and also a way for the community to give their feedback and ideas to government about the long-term plan to restore the wetland.

The Lakes Hubs have also coordinated local volunteers, who have carried out water and soil monitoring, propagating and planting thousands of plants to restore habitat and manage acid sulfate soils and the rescue and recovery of native animals such as turtles and freshwater fish.

For more information about the Lakes Hubs visit www.lakeshubs.com



River resources

- Native Fish Strategy Coordinator, SA
  Jonathan McPhail: (08) 8463 4418
- Goolwa to Wellington LAP: (08) 8536 5612
- Coorong Tatiara LAP: (08) 8757 2100
- Ngarrindjeri Regional Authority:
  (08) 8531 3868
- Murray Lower Darling Rivers Indigenous Nations: (02) 6051 9948
- The Lakes Hub (Milang): (08) 8537 0808
- Lower Lakes and Coorong Icon Site Manager: (08) 8463 6800
- SA DENR: (08) 8124 4784
- Native Fish Australia (SA):
  www.nativefishsa.asn.au
- Eastern Fleurieu Primary School:
  (08) 8537 0223
- Port of Goolwa & Inland Rivers Historical Society: 13 Goyder St, Goolwa SA 5214
- SA Memory: www.samemory.sa.gov.au
- National Library Australia: www.nla.gov.au

Abbreviations

DPI	Department of Primary Industries (NSW)
PIRSA	Primary Industries and Resources SA
SA DENR	Department for Environment and Natural Resources
SARDI	SA Research and Development Institute
LAP	Local Action Planning Association
MDBA	Murray-Darling Basin Authority

About the Talking Fish project

The *Talking Fish* project arose from an increasing realisation that many different groups of people, *including* fishers, Indigenous communities, tourists and landholders have developed unique relationships with the rivers of the Murray-Darling Basin. There is also the growing recognition that the health of the Murray-Darling Basin is at risk. Accessing and recording different people's stories about their experiences of a river, its fish and how *both* have changed will contribute to our collective knowledge and help shape future management decisions. These stories also have the potential to give people a sense of just what these magnificent rivers and their fish were once like - and could be again with ongoing rehabilitation efforts.

The *Talking Fish* project focussed on 12 reaches within the following rivers: Namoi (NSW), Upper Condamine River (*Qld*), Katarapko Creek (SA), Upper Murrumbidgee River (NSW / ACT), Culgoa - Balonne Rivers (Qld / NSW), Paroo River (Qld), Goulburn River (Vic), Darling and the Great Anabranch (NSW), Ovens River (Vic), Mainstem Murray River (NSW / Victoria), Darling River (NSW) and The Coorong and Lower Lakes (SA).

The *Talking Fish* project is a starting point to share local knowledge and learned experience with others to improve the health of the Murray–Darling Basin. Project information is available at: www.mdba.gov.au.

Note: The term *Talking Fish* is also being used by the Australian River Restoration Centre as a way of sharing knowledge about people's connection to fish and waterways.

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Mulloway fish fact box: http://www.pir.sa.gov.au/fisheries/recreational_fishing/target_species/mulloway.
Additional congolli fish fact box information courtesy: B. Zampatti (SARDI)
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Some of the aquatic species found in the Coorong & Lower Lakes region

Native (Not to scale)

Murray cod / Cod / Pondi

Mulloway / Jewie / Jewel fish / Butterfish

Congolli / Tupong / Sandy

Golden perch / Yellowbelly / Callop / Pilaki

Catfish / Eeltail catfish / Jewfish / Pomeri

Yabby / Craybob

Silver perch / Murray bream / Grunter / Tcheri

Blackfish /Slippery / Slimy / Greasy

Murray cray / Spiny cray

Introduced (Not to scale)

European carp / Common carp

Redfin / English perch

Rainbow trout / Brown trout

Australian Government | MURRAY–DARLING BASIN AUTHORITY | NSW GOVERNMENT | Department of Primary Industries | UNIVERSITY OF TECHNOLOGY SYDNEY | RURAL SOLUTIONS SA | Government of South Australia, Department of Environment and Natural Resources | Queensland Government | Victoria The Place To Be