

Culgoa - Balonne



Talking fish

Making connections with the
rivers of the Murray-Darling Basin



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Citation: Sarac, Z., Sewell, H., Ringwood, G., Baker, E. and Nichols, S. (2012) *Culgoa - Balonne: Talking fish - making connections with the rivers of the Murray-Darling Basin*, Murray-Darling Basin Authority, Canberra.

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ISBN 978-1-921914-51-5

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Published by the Murray-Darling Basin Authority (MDBA), Canberra.

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Research and editing by the NSW Department of Primary Industries (NSW DPI) and the University of Technology, Sydney (UTS). The views expressed in this booklet are not necessarily those of the NSW DPI, UTS or other project partners.

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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 River 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 km².

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 tell the stories of how the rivers, fish and fishing have changed. The main stories in these booklets are written from oral history interviews conducted with local fishers in 2010-11, and relate individuals' memories of how their local places have changed. These booklets showcase three ways of knowing the Culgoa and Balonne Rivers: 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 – Culgoa - Balonne

A very special thank you to Ned and Lynette Underwood, Roy and June Barker, the St George Fishermen – Keith Codrington, George Thomas and Robert (Bob) Worboys - Rory Treweeke, Margaret (Pop) and Peter Peterson, Robert Lacey, Micheal Anderson, Pat Stephens and Pat Cross who generously shared their stories and photographs as part of this project.

Advice and field support – Culgoa - Balonne

Hamish Sewell (The Story Project) and Greg Ringwood (NFS Coordinator, Fisheries Queensland).

Front page photographs (L-R)

Source: Pop Peterson.

Source: Robert (Bob) Worboys. Bob Worboys and wife with cod caught from the 'Garden Hole' in 1951.

Source: Pat Cross. Children after swimming.

Source: Greg Ringwood.

Back page images: Goldfish and Hyrtl's catfish: Gunther Schmida. All other fish images: NSW DPI.

'The Balonne River is well known as the home of the big Murray cod, and this excellent fresh river fish has been biting freely at different periods this year.'

The Brisbane Courier, 29 May, 1922.



'The Culgoa is as twisty as a ram's horn, and so narrow and the trees interlock so closely over the water that we had to take down the mast to get along.'

R.C.Minter and R.H. Webster, The Advertiser, 26 May, 1934.

The 123 000km² catchment of the Culgoa – Balonne Rivers is semi-arid and experiences a highly variable rainfall. The rainfall is reflected in the rivers' flows which often cease for long periods of time, sometimes for up to a few years. During such prolonged droughts only very large waterholes continue to hold water. When the rains are good, the whole floodplain may turn into a slow flowing river around a metre deep.

Geographically the Balonne is an extension of the Condamine River and starts near Glenmorgan. It flows through gently undulating country before reaching an expansive flat plain where it splits and forms several smaller rivers including the Culgoa.

The Culgoa River twists and turns across the floodplain and through coolabah woodlands before flowing into the Darling River between the towns of Brewarrina and Bourke.

These rivers are significant to the Bigambul, Kooma, Muruwari, Gungarri, Mandandanjii and Gamilaroi people who have traditionally lived, fished and told stories about these rivers and the life they support.

Today the rivers remain a vital source of water for the many communities along their length, supplying irrigation and providing food and hope for the creation of a comfortable life. People gather along the banks of the waterholes to relax, fishers throw in a line and remember the stories of the great cod once caught from these rivers.

There are those who love the river and who love to fish the river. Their stories are part of the bigger story of changes to the Culgoa - Balonne and its fish. People want to talk about a future for the Culgoa - Balonne and their visions for a healthy river that is, once again, full of native fish.

Introducing the river and its people

Shared landscape-shared stories

Several Aboriginal language groups shared the inland delta system created by the branching of the Balonne River. The Bigambul, Kooma, Muruwari, Gungarri, Mandandanjii and Gamilaroi people^{1,2} relied on the rivers' rich resources of fish, mussels, yabbies, birds, aquatic plants and grass seeds to survive³.

These groups found a way to share this area equally between each other, especially during times of drought when clans would need to move between river systems in order to find water.

This strong connection to the rivers and land meant the rivers have a deep spiritual significance as pathways for important creation stories – variations of which were shared between the groups.

Some of the Aboriginal relationships with the river can still be heard in some of the local town names. For example, Dirranbandi means 'frogs croaking in a swamp at night' and Mungindi was named from a word meaning 'digging for water place' in the local dialect².



The reach of the Culgoa, and its floodplain, adjacent to *Brenda* homestead. Photo source: Pop Petersen.

The arrival of the Europeans

After the area was first crossed by Major Thomas Mitchell in 1846², the rich alluvial soils drew a steady stream of settlers toward the Culgoa – Balonne.

The first two grazing licences were issued in 1848. The Balonne River floodplain's heavy, sticky, black soils created excellent conditions for pasture growth and forming rich grazing land.

The area soon developed a reputation for its sheep and wool production, and runs of over a million sheep were requested⁴. As the need for workers increased, Aboriginal people gained work as stockmen, allowing them to maintain their connection to Country.

Weilmoringle waterhole



The Weilmoringle waterhole. Image source: Merri Gill 1996.¹⁵

The Weilmoringle waterhole on the Culgoa River was an important place for the Muruwari people. Its spiritual significance was connected to their rainbow Serpent creation stories.

European settlers were attached to the waterhole's relative reliability and by the 1850s it was being used to water stock. Weirs followed in the 1880s and the first artesian bores were sunk in the 1890s. The pastoral camp grew into a self-contained homestead, with its own butchery and telegraph office.

By the 1970s there were more demands on water than could be met, despite ongoing development of weirs and bores.¹⁵

By 2004, Weilmoringle Station had been purchased by the Aboriginal Lands Trust for the Muruwari People.¹⁶

In the early days properties were very large, the smallest being around 10 000 acres to help survive the long droughts. Slow flowing, large floods were seen as a blessing rather than a curse as the floodplains soaked up the water and grew lush nutritious pastures¹.

Water security remained an issue in the early 20th Century. The relatively undisturbed Culgoa – Balonne prior to the 1950s underwent major changes from the 1950s and 1970s and through to the 1990s. Major water storage works were constructed and increased capacity.^{1,2}



'Boating' in washtubs on the river. Photo source: Pat Cross.

As well as private landholder investment, the Queensland Government also constructed the first large dam at St George as a pilot to supply water for irrigation. When the project proved successful, a weir ten times larger than its predecessor was built.¹

The area became a major irrigation area, although, like elsewhere in the Basin, this has come at the cost of problems associated with high native salt loads⁵.

Today the locals continue to use the river for recreational activities including fishing – the residents of St George say it's the fishing capital of inland Queensland⁶.



Ned and Lynette Underwood live beside the Balonne River, calling it their "little piece of paradise".

Photos: Greg Ringwood.



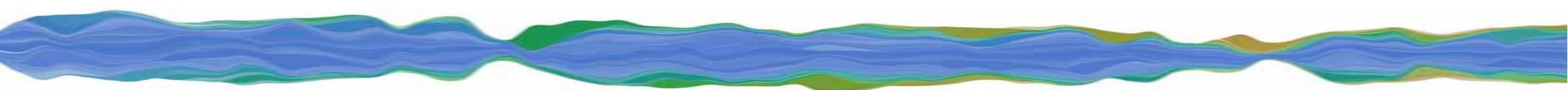
Roy and June Barker now live at Lightning Ridge, but both call themselves river people. Photo: Jenni Brammall.



Robert Worboys (pictured, in 1957), **Keith Codrington** and **George Thomas** are some of St George's fishermen. They have fished the Culgoa-Balonne catchment for over 50 years
Photo source: Bob Worboys.



Rory Treweeke likes to observe the floods and the way the floodplains get inundated. Photo: Greg Ringwood.



Ned and Lynette Underwood – belonging to the Balonne



Ned and Lynette Underwood live at *Warroo*, a sheep and cattle station that Ned's grandfather bought in 1890 after the flood of the same year.

Ned was born on the station, Lynette came to live there after they were married.



Fishing from an early age

Ned was born in 1932 and has fished since he was about nine years old.

You set your lines, which always had a cork on. You'd see your cork bobbing and hope it disappears then it'd give you a thrill.

Back then Ned used cord line, not the clear nylon used today. Ned doesn't think it matters much.

We'd still catch them on the cord line. I don't think the fish looked at the line. They only looked at the bait.

Ned caught mainly yellowbelly, jewfish and the occasional silver perch, which he calls black bream.

He never caught many cod – the biggest one being 20 pounds. Ned recalls the ease at which he caught a feed:

You'd go down and in a couple of hours you might catch half a dozen fish. A couple of good meals. I used to go every week, sometimes twice a week. You see, it was a good pastime. You know, you made your own pastime in the bush.

Ned soon got to know the best way to prepare and cook his catch:

I'd just fry yellowbelly. Didn't skin them, just scale them. Skinned the jewfish [catfish]. We didn't even bother using the black bream - we usually threw them back into the river. I never tried bony bream. Never caught a bony bream or never heard of anyone catching a bony bream on a line.



Ned at home beside the Balonne. Photo: Greg Ringwood.

Bony bream

(*Nematolosa erebi* – bony herring, pyberry, hairback herring, melon fish, thukari)



Photo: Gunther Schmida.

- Medium sized fish to 47cm, but commonly 12-20cm
- Widespread and abundant throughout the Basin, mostly in lowland rivers
- Hardy fish tolerating high temperatures, high turbidity, high salinity and low dissolved oxygen, but don't like cold water temperatures
- Spawn from October-February in shallow, sandy bays
- Migrates upstream when as small as 2.2cm
- Eats algae, detritus, microalgae and microcrustaceans
- Important food source for large fish (cod, golden perch) as well as birds (pelicans and cormorants)
- Threats include cold water pollution and barriers to fish passage

A little piece of paradise

The river was Ned's little piece of paradise. It always had water, rain or drought. When he was a kid Ned and his family used to go to the river to swim.

We'd have picnics occasionally and we'd all go swimming. We've got about 12 mile of river frontage. There was plenty of water, even in a drought. In the biggest drought you'd never go more than a quarter of a mile without water. The amazing thing was these water holes got down to a certain level in drought and they never went down much further. I think there must have been underground springs keeping them full. We learnt to swim there.

Ned also spent a lot of time in the river with his brother Dick whenever he had the chance.

When we got a bit older, nine or 10, Dick and I would go ourselves every afternoon. We were taught early, be responsible and not to go near the riverbed when the floodwaters were running. So keep back from it. I'd go down there and paddle in, playing in the sand and – it was a wonderful life.

Water baby

Lynette was born in 1931 and, as she says, is one year older and one year wiser than Ned.

Lynette recalls family life on a changing river:

Ned and I lived over the river, at Yarran Downs, when we were first married. When I took my second baby home we had to be boated over the flooded river.

Ned came to learn the easiest – and safest – ways to cross a flooded river:

There are two ways of rowing across the river in a flood. If you angle the boat, the nose of the boat upstream in the water just right, you can go virtually straight across, but you're rowing all the time. If you turn side on the stream will just take you. The other way is to take off and pick a spot down about 50 yards on the other side that's open and just go with the stream.

Shrimp, mussels and middens

Ned recalls that the river had plenty of mussels:

Mussels were fair bait but not as good as shrimp. You used to get them in the river. They're still there, mussels. I don't know if they're in the same quantity.

He used them as bait but prefers to use shrimp as he thinks they are better.

Shrimp

(*Macrobrachium australiense*, *Paratya australiensis* – glass shrimp, *Caridina mccullochi*)



Paratya australiensis. Photo: NSW DPI.

- Three species common in the Murray-Darling Basin, often forming a large proportion of the invertebrate biomass¹²
- *Paratya* and *Macrobrachium* also known from coastal drainage systems and estuaries¹³
- All widely distributed within the Murray-Darling Basin but numbers and species proportions vary between catchments¹²
- Found in different habitats including main river channels, backwaters – associated with submerged vegetation, silt/muddy bottoms and snags¹²
- Feed on decomposing plant material and algae
- Females brood eggs under their tails like yabbies
- Fast growing and breed in Spring/Summer¹³
- *Paratya* and *Caridina* live for 12 months, *Macrobrachium* for 2 years¹³
- Loss of backwaters, floodplains and billabongs are likely to be their biggest threat

I can remember the shrimp bucket, a bit of meat here, down to the river, put your shrimp bucket in. You only had to wait a few minutes and you had a few shrimps.

Mussel middens are also common in the area according to Ned, a reminder of the importance of the river to Aboriginal people.

There are a lot of middens around here too. That was heaps of mussel shell. The Aborigines used to eat the mussels, and where they had their feeds they'd throw them in a pile and they were known as middens.

Middens



Ancient Aboriginal shell midden at Lake Mungo, NSW.

Photo: National Archives of Australia A6135/1.

Mussels were an important part of the aboriginal diet of this area as is evident by the large numbers of shell middens found along the rivers and floodplains. Numerous artefacts, including clay ovens, quarries and scar trees, are also found near the shell middens.

There is evidence of the mussel species within the shell middens changing over time, from a flowing water species towards lake species. Bones found within the middens also show a shift from aquatic foods towards terrestrial animals in more recent times.¹⁴.

Straight from the river

Ned and Lynette remember in the early 1900s the water was considered so clean the locals got their drinking water directly from the river ... although you had to be careful. Lynette says:

You had to have a good look first to see there wasn't a dead beast a bit further up.

Ned replies:

It's never killed anyone that I've heard. You'd go down to the river and get a bucket of water. Before about 1940 we had big log over the water hole and we had one of those little hand pumps.

Water storages

To improve water security many properties including Warroo, built large dams to catch floodwaters. This allowed for irrigated crops, but as Ned explains, it led to other changes:

In those days there weren't many kangaroos out there and they didn't congregate because there wasn't any permanent water. It wasn't until 1939 that the ring tank was put down in Warroo and there's been a big difference – it's built up the kangaroos. I used to do a lot of kangaroo shooting when I was young and seven or eight kangaroos in a day was good. Now you'd get seven or eight before breakfast.

It was a beautiful river

The push for improved water storage wasn't just on individual holdings. Beardmore Dam was constructed from 1968-1972 in an effort to open the area to irrigation. The scheme proved very successful but the changes weren't always for the better. Ned recalls:

The river was just a beautiful river. One of the prettiest rivers you'd find anywhere. All up here in Warroo, you'd be seeing sandy reaches and waterholes and plenty of gum trees and tea trees. It's still a nice river. It gets better as you go up. Right here, you might have noticed a lot of dead gum trees and dead tea trees. Soon after the weir came in they started to die. They like to be near water, but they don't like their root system under permanent water.



Drowned trees on the Balonne. Photo: Greg Ringwood.

Roy and June Barker – continuing the traditions



Roy Barker was born on the old Brewarrina Mission in the late 1920s and he lived there until the early 1940s. He is from the Murrawari people on his father's side and the Bogan Wiradjuri people on his mother's side. June was born in 1935 on the Cummragunja Mission on the Tongala (Murray) River. Her father was a Wiradjuri man and her mother was a Yorta Yorta woman.

River people

Both Roy and June call themselves river people. Roy started fishing when he was about 6 or 7 years old. June learned the language, customs, legends and stories of the Ngemba people while she was at the Brewarrina Mission on the Barwon. They spent most of their time near the river.

The beautiful river. Always beautiful clear water, and we'd be fishing every day and swimming. The girls had their special place to swim, and the boys had their place to swim. We weren't allowed to swim together.

And all along the river, the women would be fishing, nearly every day. That was our means of surviving, too.

Hooks like gold

Roy says Aboriginal fishing with line has a long history. Before European contact, he says, the lines were made of spun and waxed possum fur. Hooks were made of shaped bone. By the time he started fishing they were using introduced fish hooks and, as Roy tells it, these were valued possessions:

They were like gold. In the cold winter months some of the old women would throw in and get their line snagged on a log seven or eight feet down under the water. They'd sing out to us, 'Come on, you boys, go and get in there now and try and get our line off'. They'd have a big fire going there for us and we'd strip off, right to our shorts, dive right down and follow the line and unhook the hook off the snag. And we'd come out and warm up by the big fire.

Home made fishing gear was common amongst the non-Aboriginal fishers too in the 1930s and 1940s. Not only hooks made of wire but also the line they used, as Keith Codrington explains:

Those days there was no such thing as nylon line. You bought what they called Irish Linen. It had a two hundred pound breaking-strain.



Roy makes fishing spears, continuing a tradition thousands of years old. Photo source: Roy Barker.

Knowing the fish

By fishing from such an early age Roy got to know the names of the fish and the ways to catch them.

Cod was the Goodoo. Catfish was the Mungulla. Yellowbelly, that's Gulidah.

There are many ways of catching fish and knowing the behaviour of the fish you want to catch helps.

Roy explains how they would catch 'Mulgu':

'Mulgu', he's a small, spotted native fish, something similar to a cod. He never grew any more than about 10 inches long. He used to always be in the weeds. He'd never venture out into the deep water because other fish would grab him. When the bigger fish went off biting in the cool weather we used to cut a big forked stick about 8 feet long, with a fork on the end of it. We'd plunge it down into these weeds, twist the weeds around and it would all gather around the forked stick. We pull the weeds up and get the shrimp and two or three of these Mulgus.

A nibble isn't a nibble

A good fisher knows what fish is biting at the end of the line before it is landed. Roy can tell from the way the fish nibbles the bait.

If he was a cod, he'd just touch the bait for half a second and he was gone with it straight out. A yellowbelly'd nibble at it for a while before he'd take it out slowly. The catfish had another bite, and the black bream, he was a little, quick nibbler. You'd pull the line two, three times, next minute you'd hook him. You'd know exactly when to pull the line and you'd get him nearly every time.

Shrimp were caught by hand. When June was young catching and eating shrimp was part of being by the river.

Mulgu?

(*Mogurnda adspersa* – purple spotted gudgeon)



Photo: Gunther Schmida.

- Other names – Southern purple spotted gudgeon
- Attractive, small robust fish, maximum size 15cm, commonly 6-12cm
- Usually associated with good cover such as rocks and cobble in Qld part of its range, and aquatic vegetation in the southern part
- Found in slow moving or still waters of creeks, rivers, wetlands and billabongs, prefers slower flowing, deeper habitats
- Undergone significant decline in the Basin
- Current distribution limited with records after 1980 from upper catchment in Qld, Macquarie and lower Murray (near Mildura, Vic/NSW, and Murray Bridge, SA – where it was thought extinct)
- Spawn when water temperature is greater than 20C, laid on a rock, log or plants
- Male guards and fans the eggs
- Threats include interactions with alien species (redfin and gambusia) and fluctuating water levels associated with river regulation are thought to be part of the reason for their decline

We'd go with the old aunties and us girls'd sit on a log. You'd dangle your feet in the clear water and feel the shrimps biting you. You go down really slow and grab him. If he was a nice shrimp, you'd just break his head off, peel him and eat him raw. He's sweet - sort of a salty sweet. When you tell the kids this they go 'Yuck'. But that's how it used to be.

Mussels were also common in the river and used as bait as well as food. June remembers:

The old women would say, 'Go and find some bait now, you girls.' You'd go along on the edge of the water, feeling with your feet. You felt a mussel and your toes just rib around him, pull him up.

Roy explains how to cook them – as long they'd been caught when the river was clear, because when the river was muddy they'd have a muddy taste.

They used to cook them on firesticks. You'd get a firestick that was blazing then you'd open your mussels up and you'd put them all along on the firestick.

Subsidising rations

The river has always been an important source of food for Aboriginal people. It became even more important when food on the missions was rationed and agricultural development changed the landscape and the

river. People on the missions struggled to feed themselves properly. Roy says the river provided an alternative.

When the land was taken our people had nowhere to forage for food, they had to depend on government handouts. The introduced animals were much easier to come by than the native animals. We became much skilled at dressing the sheep up in the darkest of nights and be gone with it. So we had to subsidise, if you like, through other means of living besides our rations. The river was one of the main sources of food there at the time, with the fish in abundance, fresh water yabbies, big blue yabbies, shrimp, and things like that.

Some fish are better than others

Catfish was one of Roy's favourites and in the past there were plenty of them to catch.

We used to catch 15 - 20 pound catfish. When the water came down muddy, if there was a big rise in the system upstream, this would stir the catfish up. You'd only catch catfish and no other fish. But they were beautiful eating.

But catfish come with spines. Roy reckons the smaller ones were either more poisonous or the spines were sharper.

They've got three fins, one on the top of the fish's body and two on the side. If it stuck

into you, it would ache all day. You'd cry with the pain. The bigger ones weren't too bad, but the smaller ones seemed to have smaller fins on them or smaller spikes. They were much sharper than a hypodermic needle and went further into you.

For Roy, any fish is good eating except bony bream - that was the one fish they wouldn't eat. Roy explains:

He was full of bones. You could eat him, if you were careful. You had to be very careful or you'd get blooming chocked with bones!

You don't see them anymore

Roy and June remember a river full of plants, insects and birds. Although some are still around, others are either rare or have disappeared completely. Roy remembers water weed, dragonflies, water spiders and some birds, like sand pipers, that they don't see anymore. Of the dragonflies Roy says:

You know, there must be a half a dozen species. We had a little red one, you've got a blue one, which is a bigger fellow. Then you've got another one in between who was a different colour. But that's how they used to breed, down in these weeds under the water, and they'd come up on top then, with the other weeds that were floating, and that's where they'd hatch out, those dragonflies. We don't see them anymore.

A complex system

Rory Treweeke, Narran floodplain landholder and fisher, explains the channels that form the Culgoa-Balonne system:

The Culgoa heads down and joins the Barwon Darling between Walgett and Brewarrina.

The Narran then takes off just south of Dirranbandi, and forms the eastern most stream, which terminates in the Narran Lakes, again, between Walgett and Brewarrina.

The Bokhara and the Birrie are the two middle streams. The Bokhara runs into the Barwon River, just downstream from Brewarrina, and the Birrie actually rejoins the Culgoa just before it enters the Barwon.

At the point at which the Culgoa enters the Barwon is actually where that river changes its name from the Barwon to the Darling.



Culgoa River at Brenda Station near Goodooga. The expansive floodplain of the Culgoa-Balonne and its rivers are all interconnected. Photo source: Pop Peterson.

Keith Codrington, George Thomas and Robert Worboys - St George fishermen



Bob with cod caught from the 'Garden Hole' in 1951.
Photo source: Bob Worboys.

St George fishermen Keith Codrington, George Thomas and Robert (Bob) Worboys have been fishing in the Culgoa-Balonne catchment for over 50 years. They have seen many changes in the river and have had a lot of great fishing experiences.

Catching cod

Like a lot of fishermen, cod are one of Keith, George and Bob's favourites. Keith and George remember a story of one particularly crafty cod:

Keith: George Ward used to go fishing and he kept getting his line broken. So he set a hook on the end of a clothes line. Rope. And it broke that. You could see the fish swimming along and dragging this cord behind it.

George: I think eventually they did catch it. I don't know how much it weighed but it was breaking all their lines. Actually broke a clothes line, broke.

Bob says back before nylon line was invented, you had to use all sorts of different materials.

In those days there was no such thing as nylon line. You bought what they called Irish Linen which was braided and had a two hundred pound breaking strain.

And what you did with the fish when there was no refrigeration.

The biggest fish I caught was up at the junction. Took me about an hour get him and I had him tethered two days. He dressed over seventy pounds.

Clear water

When he was young Keith remembers how the river would clear over spring and into summer. Clear water meant spinners could be used at a popular fishing spot called the 'Garden Hole' - a large hole in the river south of Beardmore Dam.

The water probably started clearing about September, then you could spin through until

about January. You'd catch cod, anything, any size at all, catch 'em up to fifty pounds, sixty pounds.

Spinners have long been a popular way of catching fish - the flashing of the blades attracting the fish. But, as Keith says, the fish have to be able to see the flash:

You gotta have clear water. Olden days you could see down 6 or 8 foot. You could see the cod laying down on the log sometimes if you were lucky enough.

Bob also remembers having no trouble catching a feed or being able to see great sights underwater at times but laments these times may have passed.

Years ago you could go down to the river and if you had a tin of worms you'd have no trouble catching a bag of jewfish or black bream. When the river was clear, you'd go down and you'd see shoals of them. 300 fish, maybe more not no more.

Rory Treweeke, another local fisherman and keen observer, has noted a certain order to the way the rivers cleared:

Certainly in my lifetime the Culgoa seemed to be the river that became clear enough for spinning first. On occasions some of the big waterholes in the Narran would be the same.

Muddy water

While Keith, George and Bob remember the river as having clear water, over the years turbidity has become a problem. George thinks that is due to introduction of carp.

If we didn't have a lot of rain for 2 to 3 months, it'd get that clear you could see the bottom of the river. Now since the carp have come up this far I have never seen the water clear like that ever. And how long since that? About 1950s the carp came.

Bob also believes there is a link between the arrival of carp and the loss of water clarity.

Before the carp came I've seen this river run to 39 feet deep. Not once, but a few times. Once the flow settled down, then after a couple of months it'd clear. Never cleared since the carp've been here.

But for Keith, the problem is a bit more complicated. Other things contribute to the problem of silting and turbidity he says.

It could be the carp. They probably have a big bearing on it. The other thing is we've got the structures across the river length. Before building of the weirs, there used to be little flows that came through, like a little brook and it sort of cleared and was kept cleared. But with the structures, when it comes down and if the turbidity is still there, it doesn't really matter. You know I'm still at a loss to

say whether its nutrients in the water, it's the carp, or the actual flow of the river itself.

Shifting sands

Changes in the river are sometimes evident over a long time frame – others happen quite quickly. One of the changes observed by George was associated with construction of the Jack Taylor Weir in about 1953 and its impact on water flows. George saw an immediate change in the river below their house:

In the middle of the river below our house was a sand island with two trees, probably eight or nine inches through. We could see the tops of the trees and used to gauge how high a flood was by the trees. I remember the first flood after the Jack Taylor Weir was built. We were waiting for the trees to show up and they didn't. The whole island and all the trees and everything were completely washed away. After that first flood that island vanished. It's never been there since.

Keith has seen some of waterholes completely filled with sand, which he thinks is also probably due to the Jack Taylor Weir.

Mainly you'll find that in the lower reaches, at the bottom of the dam, especially at the Jack Taylor Weir, the sand has just shifted and it's only from the weight and current.

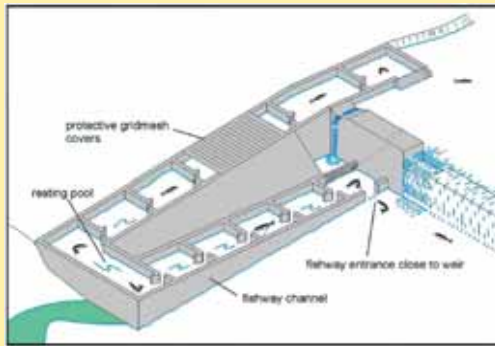
Dam impacts on fish



Beardmore Dam (pictured) and Jack Taylor Weir have both changed the Balonne. Photo: Hamish Sewell.

- Native fish have evolved to breed when there are 'freshes' (flows)
- Dams modify the pattern and seasonality of water flows and even out the flows, so fish don't get the signals to breed
- Fish, such as Murray cod and golden perch, migrate to breed - if they are able to, these fish can travel hundreds of kilometres
- Dams and weirs interrupt fish migration
- A dam wall and height difference created in water levels up and downstream mean dams are impassable barriers to our native fish
- Fish need a temperature signal to spawn
- Water released from large dams can lower the temperature of the river for hundreds of kilometres downstream. Known as 'cold water pollution' this also disrupts native fish breeding

Fishways (fish ladders)



Vertical slot fishway – inset = water movement (blue) and fish (red). Image: NSW DPI.

- Fishways allow upstream fish passage past low level weirs that are less than 6m high
- Fishways act to overcome the height difference in water levels up and downstream of a dam by providing a gentle gradient using a series of small rises and resting pools, allowing fish to “step” their way up and over the barrier
- There are various fishway designs, the most common in the Murray-Darling is the vertical slot
Vertical slot fishways comprise of a series of concrete boxes – each slightly higher than the previous - that hold water to create pools
- A slot at either end of each box controls the amount of water passing through and water height difference between successive boxes
- Fish must swim fast as water falls through each slot, being able to rest after reaching the next pool
- Fishways can be designed to suit the swimming ability of particular fish species present

The sediment is just picked up and moved and it might almost envelop or fill in a hole that was once twenty or thirty foot deep. After the flood, it absolutely changed the whole face of that hole. There may not even be a hole there. And when I'm talking holes, they could be anything from fifty to a hundred yards long. But they've filled up with sand.

Bob notes that some of the damage downstream of Jack Taylor Weir may have been due to the way the water was managed in the early days:

Down below the weir, when they used to manipulate the water and dropped it from 100 thousand down to 40 thousand megalitres, that'd let everything just drop underneath: fall. The big trees would drop. And the next thing you knew the holes were getting clogged up with sand.

Carp

Although not willing to completely blame carp for the water quality issues, Keith thinks carp is the major culprit for the loss of the aquatic weeds.

Where there used to be weeds up the river – they're not there no more. The carp must've chewed them out. The problem with the carp is that they're bottom feeders. So if you've got a bank with a straight drop off, I've seen

them there by the hundreds and they're just nosing at the bank and sucking at the bank.

Roy Barker also believes the river at Brewarrina has changed over the years, particularly due to the introduction of carp.

Whenever we go down there now to Brewarrina, the river looks dead to us. There's no life in it. And the weeds are all gone. We believe this is so through the introduction of the European carp. In my view, carp have done more damage than the rabbits. They've undermined the big gum trees, and once these trees fall in, they take a quarter of an acre of bank with them, which is clogging the system up.

Roy believes that carp not only impact the river by creating erosion but also by affecting the native fish.

They've cleaned all the native fish eggs up and the fingerlings of the small fish that used to exist there in the thousands. We'd see thousands of these native fingerlings in a school of fish coming up the river. But, I think, they no longer exist. The native fish must be very good fish to exist or to go through that dark period of time and still be around today. Perhaps not so many, but they had a resistance, especially the cod and our yellowbelly.

Like Roy, George Thomas thinks the effects of carp aren't limited to turbidity and recalls noticing an immediate change in the sandfly population just after carp were noticed in the area:

After a big flood when the river went down and left the banks all muddy we used to get plagues of sandflies. This particular year, just after the carp were known to be in the river, I can remember the river went down and we didn't have any sandflies. I went down in front of our place and in amongst the grass and all amongst the banks it used to be a sheet of mud. This time it was just completely taken up with little craters. I think it was the European carp burrowing down in the mud, sifting through it, and taking out the sandfly eggs because we didn't have any sandflies that year. That's the only reason I can see for it. The whole bank was just a mass of these little craters.



Mick Collier with cod caught in 1939. Photo source: Bob Worboys.

Carp - FAQs

(*Cyprinus carpio* - European carp, koi carp)

In the 1960s the strain of carp, 'Boolarra', was introduced illegally to Victoria and spread rapidly to all waterways of the Basin.



Can carp survive in mud or salt water?

No, carp cannot live in mud. They can tolerate a wide range of extremes conditions, including very low dissolved oxygen levels and half seawater salinity.

Are carp eggs carried by bird's feet and able to survive to be fertilised at any time?

No. Carp eggs only survive out of water for a short time and are usually attached to plants. Unfertilised eggs soon die.

Do carp undermine river banks and cause trees to fall into rivers?

Carp feed by sucking sediment into mouth, removing food (eg, insect larvae, crustaceans and some plant material), and expelling sediment out through gills. There is no evidence that they undermine banks.

Do carp eat native fish and eggs?

Carp may eat small numbers of eggs or larvae but these are likely to be taken incidentally. Carp are thought to increase turbidity and to compete with native fish for space and food.⁷

History of Carp FAQ

Why were carp brought into Australia?

During the early days of settlement many different types of animals and plants were introduced into Australia in an attempt to imitate a European environment. Carp were seen as a good sport and food fish.

When did carp arrive in Australia?

The first records of carp in Australia were from Victoria in 1859 and NSW in 1865 where they were released into ponds. During the 1900s carp were released into the wild but did not become widespread.

Many early newspaper accounts in the Basin around the turn of the 20th Century refer to carp being widespread and abundant, however these reports are referring to 'golden carp' or goldfish (*Carassius auratus*).

Carp spread in the Basin after they were released into the Murray at Mildura in 1964. Their release and spread coincided with widespread flooding in the early 1970s, but their use as live bait probably also helped.

Is there just one type of carp?

There are many species of carp, and the fish is widely farmed overseas for food. In Australia there are at least three strains of the one species, *Cyprinus carpio*.

Genetic studies have shown there were two strains in Australia prior to their expansion in 1964: the 'Prospect' strain in Sydney and 'Yanco' strain in the Murrumbidgee Irrigation Area. However it is the 'Boolarra' strain from a farm in Gippsland that was released at Mildura and is now the most wide spread⁷.

Rory Treweeke – river observer



Rory was born in the early 1940s and from the mid-1940s has lived on the Narran floodplains just north of the Queensland – New South Wales border. He owns *Angledool*, a large property in the area. When Rory was young he loved the river and the fish. He completed part of his

education through correspondence which meant he was able to go to the river and fish regularly.

When I was a kid living at home doing correspondence I used to do quite a bit of fishing. Nothing sophisticated in terms of equipment. Just a hand line, with a hook and a sinker and probably a worm as bait. Yellowbelly and catfish were the main two that we were after and they seemed to be readily available, from memory, at the time.

Rory found excuses to go fishing in the intermittently flowing river or in one of the permanent water holes. He was rarely short of other willing fishers to go with.

I remember frequenting the river a lot when the shearing team was at home because the wool presser and a couple of other shearers thoroughly enjoyed fishing and I used to go with them.

They only took what was needed for a meal. It was a mile walk from the house to the nearest waterhole, so they'd carry the fish home in a sugarbag – being careful to avoid catfish spines poking through!

The elusive ones

A probable reason yellowbelly and catfish were favoured was discovered after talking with other fishermen.

Cod have always been the elusive one to catch and from talking to fisherman who love going after cod, there are only certain years when they seem to be able to get them, generally in winter time, after a series of pretty hard frosts. Now what the connection is, I don't know, but that seems to be the case.

Sweet water

Although the Narran can have a lot of sediment, it is, according to Rory, good to drink. Rory knows how to use 'kopai soil' - a local soil that has a particular chemical in it which settles out the suspended sediments. Rory recounts how Aboriginal people would also use ash to settle the sediment, clearing the water for drinking:

The Aboriginals used to sometimes burn gidgee down to ash, then use the ash to settle the water. They'd put it in a container and use the water for drinking.

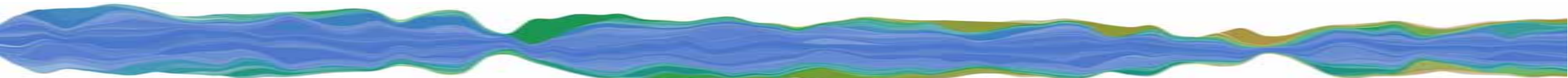
Rory thinks the water is drinkable as it is:

I'm quite happy to drink river water. No problem. River water has a very pleasant, very sweet flavour. We don't have salinity issues in this river system. As far as I'm aware, chemical residues are virtually non-existent. So it very sweet water to drink.

A different system

One of Rory's interests is observing the way rivers flow and floodplains get inundated with water.

It's interesting that one of the productive and environmental strengths of this system is that once these rivers get out onto the flood plain, they tend to vary very much in the size of the main channel. The majority of rivers, as they go further towards the ocean, generally tend to get a bigger main bed of the river. These don't. These fluctuate. Sometimes they actually contract as they go further down the system, which means that the water spills out over onto the adjacent floodplain at much lower levels than they otherwise would.



Cleansing

The years Rory has spent observing the floodplain and its rivers has given him an appreciation of the good times and the bad.

Droughts are a necessity in our environment. They actually can have a cleansing, cathartic impact on the environment. In a commercial sense it's very difficult to manage through them. But they are part of what we have to live with and the sooner people realise that drought is likely to dominate one's life in these areas; the easier you will find to manage the country.

... Rebirth

Although in many parts of the country flooding is considered to be potentially disastrous, regular flooding is considered necessary in this part of the country.

I know that in the southern part of the Murray-Darling Basin, it's highly regulated and people probably do not want floods on their country. We look forward to floods here. They are the regeneration, the rebirth of the countryside. They replenish the moisture stores in our grazing land and in the floodplain areas that we crop. Floods in the public's mind are very often associated with damage and mayhem. Not out here.

Rory notes the link between the rivers and floodplain:

Our rivers are intimately connected to the floodplain. They need the floodplain to draw nutrients from. The floodplain is a place where a lot of the fish and other creatures do their breeding. So if you deny flooding to the floodplain, you will impact negatively on the health of the river.



The Cross family at the Angledool Weir on the Narran River. Photo source: Pat Cross.

Changes in flow

Rory has observed some major changes in the flow behaviour of the Narran River over the years. Some of the changes are associated with the development of upstream irrigation, which means the extraction of water from flows that would otherwise have come through unimpeded.

That has had a drastic impact – particularly the small and medium floods that we used to get. 2004 was the starkest example of that. A flow came through St George that, prior to development, we would have expected probably 4 to 5000 acres of flooded country. On that particular occasion, the water was flat out half filling the main channel. So it didn't get anywhere near spilling out onto the floodplain.

A long river to travel

It's not only the flow that has changed while Rory has lived on the Narran. Rory has observed newcomers to the area and the impacts on the native fish.

It's interesting that the European carp came into our system in the 1974 flood. They made a gigantic leap from somewhere down the bottom end of the Darling, right up to Dirranbandi-St George area and then came back down our system. The immediate effect was what appeared to be the total demise of catfish. There was a period for 15 – 20 years when they virtually seemed to have disappeared. But, over the last decade, catfish have certainly made a recovery. It's interesting that – and I'm no expert on fish – it would appear that the native fish have made some adjustment to the presence of the European carp.

Weeds, weeds and weeds

Other newcomers Rory has observed arriving in the area include plants called knotweed, parkinsonia and lippia.

We've got one thing called knotweed at the moment. It's built up over the last 10 or 15 years. It grows along the banks but spreads out into the water, is vigorous growing, covers the surface and is a pain in the neck. We know that there have been outbreaks of lippia here. I haven't seen any since this last flood, so I'll be interested to see whether it comes again. We saw it back in the mid-2000s, but with the drought here since, it hasn't poked its head up. We keep an eye out for it. We do have some parkinsonia. They're a very prickly bush and look a little bit like prickly acacia. We're bringing that under control by repeated poisoning of any new outbreaks. Unfortunately, the seeds remain viable for decades, so it's going to be a constant watching job probably for the next 20 or 30 years.

The love of the river

Even with the changes he has seen, Rory still counts his blessings, although his appreciation of the river is different to when he was boy.

As a kid, I think you're interested in the results of your fishing. Like most kids, I was impatient to catch something. I suspect that the contemplative value probably come as you get older. There is nothing more pleasant than just lying down on the bank of a river and listening – even if the river's not running. Just listening to the wind through the trees, listening to the birds. Watching some of the cranes, the herons, and everything else going about their business of picking up whatever it is they're interested in at the time.

Here on Angledool we're lucky: we have an ephemeral lake and it's a superb piece of country. It filled for the first time for 16 years in the floods earlier this year. We've had swans and pelicans nesting there, we've had waders, ducks, egrets, terns, even the odd seagulls. It's a lovely area to visit.



A sea of slender knotweed in flower on the Murray floodplain. Photo: Murray-Darling Freshwater Research Centre.

Weeds, weeds and weeds

(*Parkinsonia aculeate* – parkinsonia, *Phyla canescens* – lippia and *Persicaria* spp. - knotweed)



Parkinsonia (left) and lippia (right). Photos: http://www.dpi.qld.gov.au/4790_7332.htm and Milly Hobson.

Parkinsonia is a Class 2 pest plant in Qld, a Weed of National Significance and one of northern Australia's worst weeds. It is a flowering thorny shrub or small tree (to 10m) that forms dense thickets along and in waterways. Can be confused with species like native prickly acacia. Prevention of its spread is difficult as seeds are dispersed by water. Sightings should be reported and control is required by landholders.⁸

Lippia is a flowering groundcover, well adapted to floodplains and is extremely difficult to control. Lippia prevents the growth of other species by outcompeting them and quickly forming dense mats.⁹

Knotweed is the collective name for a number of species in the genus *Persicaria* that are native to Australia and other countries around the world. Several species are found in the Murray-Darling Basin and grow in wetlands and along river channels where they can grow into the water, forming dense mats and causing issues for irrigation infrastructure.¹⁰

Making connections

Legends protecting the young

To Aboriginal people the river hasn't only been a source of food and water – it was a social gathering place. But, as Roy Barker explains, the river has always been used according to the customs.

Some of the mythical stories told by the old people kept the kids in order. One story goes that we've got a place, a deep waterhole there in the Barwon, they call it the Mirriguna. Now Mirri means dog, in the Ngemba, and guna means hole, the water hole, big waterhole. At the moment this Mirriooligun comes out of the Mirriguna, he's the size of a domestic cat. As he goes up the bank he grows in size to a shetland pony. He was known because there's a mythical time to go home, that existed there, with the Mirrioola, there, at the time. And the voice sung out, "Time to go home." Of course, we never, ever heard that voice. Just before the sun got to tree top level, or perhaps the tree top level, late in the afternoons, someone would get a premonition, and sing out, "Time to go home." And we'd be gone.

Roy believes there is a more practical reason behind the legend. It is to protect children from unnecessary danger.

Even though it was a mythical story, the idea was to keep the kids out of danger before nightfall. When the whites first come into those areas there were cases of non-Aboriginal children being lost and drowned in that river system. But in all the years that we lived there, there was never any kids lost in the bush country, or any kids drowned. Even though it was a mythical dreamtime story, it was a good one.

Making a bark canoe

Trees scarred from making bark canoes are all along the river, but not always where you'd expect as Roy explains:

But wherever you go in the bush country, even miles and miles from any river country, any river, you'll see these scarred trees, these canoe trees, that are cut. They must have got torrential rains at that period of time and the country became flooded, miles from any river, so they cut them down on the spur of the moment and crossed the flooded country this way to another sandhill where there was wildlife. I couldn't see them carrying their bark canoes 10 or 12 feet long, 20 to 30 miles to any river.

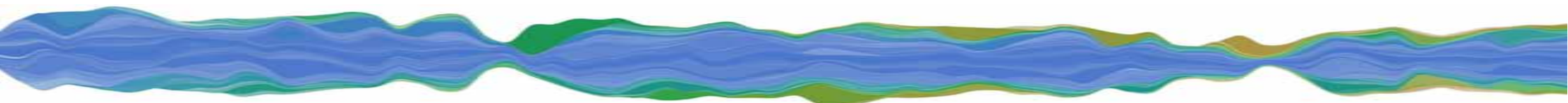
Roy is one of those who still know how to make the bark canoes.

Two years ago, my two boys and I cut two big bark canoes, one for the National Museum in Canberra, and one for the Australian Museum in Sydney. That's the first time a canoe had been cut on the river country for 70 years. Our people cut the canoes from the straight river gums. There's only a certain time of the year when the sap is running that you can get that bark off. The moment you cut around there and break what we call the seal, that's the seal right around, and put a few wedges in, you can lift the bark off real easy. In the hot summer months is virtually impossible to get the bark off without breaking the bark up.

The whole town is fishing

According to Rory Treweeke, fishing and the river has always been a very important part of the social wellbeing at Angledool and Goodooga – a way of teaching children about the river.

The shearers knew where the waterhole was. I remember talking to one of the shearers from Goodooga who was saying that the relaxation for the town when the shearers came back from wherever they'd been working, would be to go down onto the Culgoa and spend the weekend fishing.



The majority of those people were Aboriginal. That was their way of continuing their connection with the country. Fishing was not only a good food source for them, but a way of being able to impart their knowledge onto their kids and just also spend a very pleasant weekend on the riverbank, enjoying the fishing.

Margaret (Pop) and Peter Peterson, who managed *Brenda Station* at Goodooga on the Culgoa for 27 years saw that the river was also vital to wildlife as well.

We used to notice wallabies on the other bank from the house, in a drought, would pull the duckweed in. And when they had a pile they'd sit there and eat it then they'd pull another pile in. Because we were on the other side of the river we could see that this was happening. It was a little swamp wallaby that used to do it fairly regularly.

As irrigation development blossomed around them, they also noticed the changes in the river, especially during flood times. Pop explains:

You still get the water flood at the same time. But the duration of the flood being on the country was dramatically limited because the water upstream was being taken into storage all the time. The water had to reach a certain height before irrigators were allowed to take water, but once it got above

a certain height it was just free for all. That's when you just didn't have that peak for very long any more which was a shame because it would be on the country and off again and it didn't really have much time to soak in. Especially on the extremities.

Rory Treweeke believes some of the floodplain vegetation is suffering as a result, whereas others are okay for now:

The vegetation, depending on where it is on the floodplain and what the return interval is, has adapted to that regime. Where the small floods have been denied because of water extraction upstream, there has been a lot of coolabah killed, simply because of the lack of water. In the intermediate areas, there are signs of it dying, but some are holding on. Out on the areas that only get a flood once every 10 or 15 years, the vegetation, including the coolabahs, is still quite healthy.

Rory reflects that, for the Narran, it's lucky the river was not as desirable to the early boating industry.

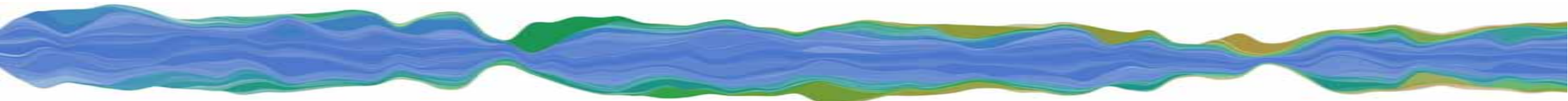
It's never been a navigable river. So what snags were there, have stayed there. And, from that point of view, very good fish habitat, particularly in the large waterholes that are a natural refuge during the drought



Culgoa River at *Brenda Station*, Goodooga, during a dry spell. Photo source: Pop Peterson.



Culgoa River at *Brenda Station*, Goodooga, during flood. Photo source: Pop Peterson.



Visions for the Culgoa-Balonne

The 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 people suggested ways to help the river and in turn help provide healthy habitats for fish.

Managing the flows

Like other landholders in the area Rory Treweeke is concerned about the amount of water being extracted for irrigation. Rory believes the finger of blame often gets pointed at particular industries like rice in the south or cotton in the north, but thinks there is a better way to look at water allocation:

Our water gets extracted by private irrigators who put it into large on-farm storages, which they irrigate from. Our main concern is that the Queensland Government has permitted far too much extraction on this system. I don't think it's a matter of a particular industry, it's a matter of understanding how much water can be extracted from a river system before you damage its ecological functioning.



Floodplain vegetation on the Balonne at Warroo Station. Photo: Greg Ringwood.

Rory also realises that better river management can also start at home.

What I would ultimately like to do would be to fence the river off from stock drinking on it, because stock don't have a good impact on the river banks and areas there. Cattle in particular tend to wander into the waterholes and defecate and urinate in it and puddle them up, which is not good. We have a pretty extensive frontage, so it's not a cheap exercise to do, but ultimately, I would like to fence off the river and provide water for stock so that the banks of the river and the riparian zone don't get impacted.

As part of a study on the economic and social impacts of reduced irrigation water in the Balonne Shire in 2010, one Aboriginal resident said it's important to find a balance:

We've got to look after it. It's our life, so we shouldn't be greedy about how much we take out. We need jobs but we need the river to be healthy, too.⁶

State of river: 'moderate'

The Sustainable Rivers Audit (SRA) is an ongoing and systematic assessment of river health for 23 major river valleys in the MDB. Environmental indicators include hydrology, fish and macroinvertebrates, which are monitored and will highlight trends over time.¹¹

The Culgoa – Balonne was surveyed as part of the Condamine Valley survey in 2005.

In the 'Lowland Zone' of the Condamine Valley fish community and Ecosystem Health were considered to be in Moderate Condition. 50% of predicted native species were caught, alien fish were widespread and comprised just over half fish biomass (56%).

Bony herring, Australian smelt, golden perch, Murray-Darling rainbowfish were numerous. Carp gudgeon and spangled perch were also common. Three alien species, eastern gambusia, carp, and goldfish, were captured.

Bringing back the fish

a) Queensland Murray-Darling Committee

The Queensland Murray-Darling Committee (QMDC) is a community-based, not-for-profit organisation that delivers natural resource management services along the parts of the Murray-Darling Basin within Queensland, including the Culgoa-Balonne Catchments. Its main objectives include improving the health of the rivers, wetlands and floodplains and reducing the threat of weeds and pest animals. One of the main pest species they target is the European carp. In addition to running regular carp-buster events to educate the members of the public about the impacts of the carp on native fish population, QMDC is planning to establish an integrated carp management program using fyke nets which are designed specifically for the control of carps. Further information can be obtained on (07) 4637 6200 or at www.qmdc.org.au.

b) Aboriginal Rangers Program

The QMDC, in collaboration with the Federal Department of Sustainability, Environment, Water, Population and Communities has

developed an Aboriginal Rangers Program to deliver environmental outcomes within the Northern Murray-Darling Basin in Queensland. The area also includes the catchments of the Culgoa and Balonne Rivers. The Aboriginal Rangers work with land managers to boost the sustainability of the Basin. The program will result in an exchange of Aboriginal cultural knowledge along with strong natural and cultural outcomes. The catchment based activities that are carried out within the Aboriginal Rangers Program aim to improve aquatic habitat and fish populations by fencing river banks, undertaking weed control and protecting sites of cultural heritage. For further information and to get involved contact Mr Troy Turnbull (07) 4637 6200.

c) Western Catchment Management Authority (NSW)

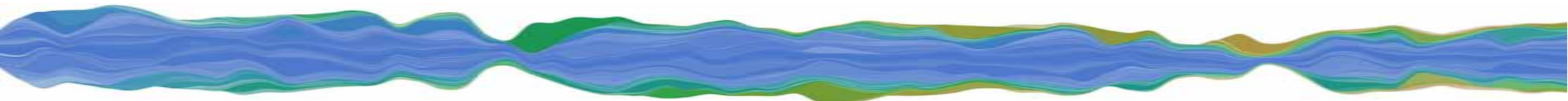
The NSW Western Catchment Management Authority has been established to ensure the local community has a significant say in the management of natural resources including land, vegetation, rivers, groundwater and biodiversity.

The Western CMA assists the local community in being actively involved in natural resources management initiatives.

Two of the management targets relating to improving rivers include:

- Habitat improvement in 20% of identified priority stream, floodplain, wetland and riparian areas by 2016.
- Water quality and salinity levels meeting ANZECC drinking water and recreational use criteria for greater than 95% of the time at key town use sites by 2016.

The main activities include management of floodplains, improvement and management of riparian zone, protection and rehabilitation of fish and threatened aquatic habitats, improving connectivity by providing fish passage and the control of alien species such as carp. For more information go to www.western.cma.nsw.gov.au.



River resources

- Native Fish Strategy Coordinator, Queensland, Greg Ringwood: (07) 3224 2164
- Native Fish Strategy Coordinator, North NSW Anthony Townsend: (02) 6763 1440
- Queensland Murray-Darling Committee: (07) 4637 6200 <http://www.qmdc.org.au>
- St George and District Fishing and Restocking Club Inc.: dkpanel@bigpond.com
- Culgoa Landcare Group: (02) 6836 1575
- Maranoa-Balonne Catchment Management Association: (07) 4622 6011
- Warroo Balonne Regional Landcare Inc., John Scriven: (07) 4625 3634
- Nindigully Landcare Group Inc., Liz Hill: (07) 4625 9159
- Balonne Beacon (newspaper): (07) 4162 2277
- Queensland National Parks and Wildlife Service: (07) 3227 8186
- NSW Parks and Wildlife Service: (02) 9995 5550
- Culgoa Dreaming Consultancy: (02) 6872 4647
- Balonne Shire Council: (07) 4620 8888
- National Library Australia: www.nla.gov.au

Abbreviations

DEEDI	Department of Employment Economic Development and Innovation (Qld)
DPI	Department of Primary Industries
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. By 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), Lower Darling and 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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Some fish of the Culgoa - Balonne region

Native
(Not to scale)

Murray cod / Cod



Hyrtl's catfish / Moonfish / Yellow-finned catfish



Golden perch / Yellowbelly / Callop



Catfish / Eeltail catfish / Jewfish



Yabby / Craybob



Silver perch / Murray bream / Grunter



Spangled perch / Bobby cod



Introduced
(Not to scale)

European Carp / Common carp



Goldfish

