

*Upper*  
**Darling**  
*Brewarrina to Bourke*



# Talking fish

Making connections with the rivers of the Murray-Darling Basin

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**Citation:** Frawley, J., Nichols, S., Goodall, H. and Baker, E. (2011) *Darling - Brewarrina to Bourke: Talking fish- making connections with the rivers of the Murray-Darling Basin*, Murray-Darling Basin Authority, Canberra.

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ISBN 978-1-921914-47-8

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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 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<sup>2</sup>.

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 Upper Darling River: 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 – Upper Darling: Brewarrina to Bourke

A very special thank you to Gordon Brown, Phil Sullivan, Phillip Parnaby, Dwayne Willoughby, Feli McHughes, Mick and Barb Davis, Alma-Jean Sullivan, Cathy Simpson, Keith Coleman, Max Jeffrey, Brad Steadman and Joe Flick who generously shared their stories in this booklet.

## Advice and field support – Upper Darling

Phil Duncan (Ngnulu Consulting), David Cordina, (NSW DPI) and Anthony Townsend (NSW DPI).

## Front photographs – L-R

Source: Phil Sullivan - Wellbeing Project DECCW (Byrock waterhole).

Source: Phillip Parnaby ('Bull' Milgate, Robert Parnaby, Dean Bowden, Jason Sommerville, Phillip Parnaby and Dick Oxley).

Source: Scott Nichols.

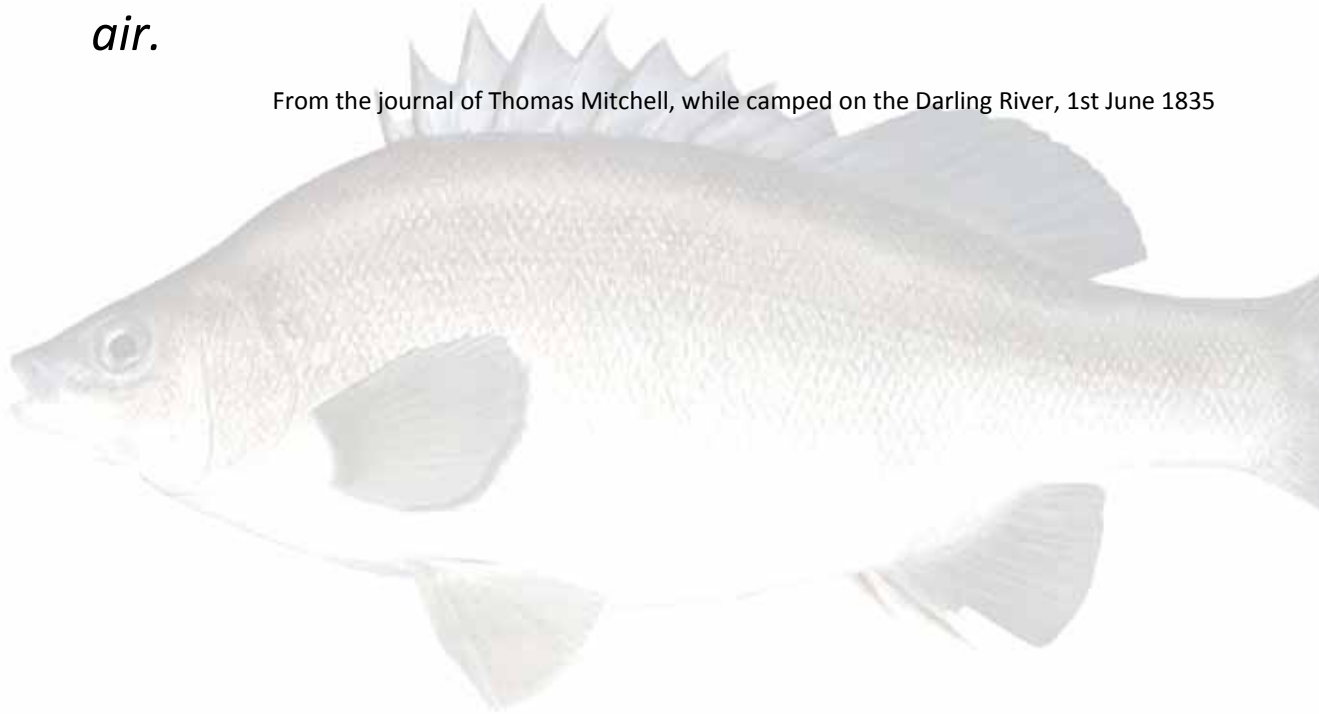
Source: Scott Nichols.

## Back page images

All fish images except goldfish: NSW DPI. Goldfish image: Gunther Schmida.

*The water being beautifully transparent, the bottom was visible at great depths, showing large fishes in shoals, floating like birds in mid-air.*

From the journal of Thomas Mitchell, while camped on the Darling River, 1st June 1835



To say 'Back o' Bourke' means 'miles from anywhere' to most Australians, however the Barwon and Darling Rivers that pass by the townships of Brewarrina and Bourke, respectively, are at the heart of the Murray-Darling Basin. These are the traditional lands of the Ngiyampaa, Murawari and Yuwalaraay peoples (refer *Aboriginal language groups* in the *Bringing back the fish* section at the back of this booklet). They fished the river and surrounding waterways and hunted the wetlands. The Ngiyampaa, Murawari and Yuwalaraay people have seen their land and the rivers change.

Bourke was once the end of the line for most of the paddlesteamers that made their way up the muddy Darling from as far away as Goolwa. The steamers sometimes had to wait for months before the waters became navigable. Rains that fell anywhere from the Condamine in Queensland to the western edge of the Blue Mountains, fed increasingly muddy waters into the Barwon and Darling. When the rains didn't come, the channel dried to a series of pools.

Since Europeans arrived the health of the river and its fish have been shaped by those who came to live there and the industries they developed. The paddlesteamer trade, grazing, and irrigation, all changed the rivers as weirs were constructed, reaches desnagged, water extracted and foreign animals and plants introduced. Different types of workers brought new needs to the river and new ways to catch fish. These changes mean there are now a lot less fish than there were. Before the turn of the twentieth century, there are stories of catching great numbers of silver perch, Murray cod, catfish and yellowbelly. There were no carp.

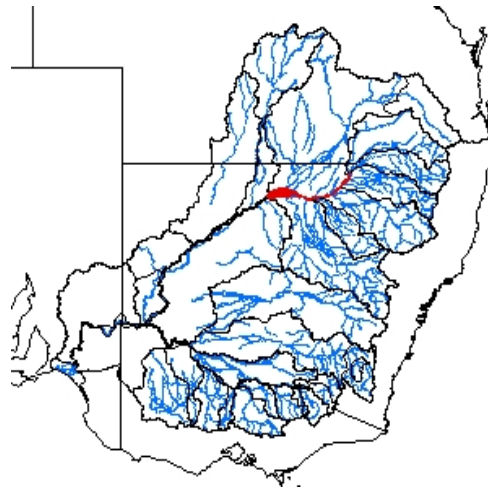
There are still those who love the river and who love to fish the river. Their stories are part of the bigger story of changes to the Upper Darling and its fish. They help us remember that the river we see now is not what the river was and can be again. People want to talk about a future for the Upper Darling and their visions for a healthy river that is, once again, full of fish.

# Introducing the river and its people

## In the footsteps of Baiame

Baiame, the Creator, strode across the landscape from near Cobar to the mountain at Gundabooka then on to Byrock, where the mark of his footprint was preserved in the still-soft rock. Baiame continued on to Brewarrina, and stopped at the deep waterhole called Gurrungga where a great black fish was imprisoned behind Gurrungga's rock wall. Baiame, being hungry, raised his short wooden spear, wounding the fish which broke through the rock wall, burrowing desperately into the hard ground to escape. Baiame dug after it, cutting a channel that filled behind him with the escaping water from Gurrungga.

The fish grunted with pain, then dodged and twisted away from the spear thrusts to form the tortuous bends of a now mighty river. Where the fish doubled back are the still billabongs. The hard rock barriers that cross the river are where Baiame rested in his pursuit. The chase continued until the black fish broke into a broad river in the south and made its escape. So the Callewatta was formed and can still be traced from Brewarrina to the sea.



Later during a great drought, the waters below Gurrungga dried up, the fish disappeared and the people were starving. So Baiame returned to help, bringing his two sons to help build a stone web in the shape of a huge fishing net stretched across the dry river bed. Baiame showed the old men how to dance and call the rain. After many hours of dancing, the rains came, filling Gurrungga until its waters rose and rushed over the rock wall, covering Baiame's stone net, or Ngunnhu, and on down the dry Callewatta. Slowly the flood fell, exposing Ngunnhu, and thousands of trapped fish. This is how the Rock Fisheries came to Brewarrina.

## The arrival of the Europeans

In 1828 Charles Sturt came to the Darling in a dry year and proclaimed it uninhabitable. Thomas Mitchell arrived during a better season and established Fort Bourke in 1835. The river was essential for the grazing runs until artesian drilling found water in 1879.

After early conflict, Aboriginal people worked seasonally in the pastoral industry, camping on their own land within the big runs, moving between station work and caring for Country.

By the 1870s Bourke was a transport hub. It had the port and Cobb & Co services. Then, in 1885, the railway arrived. Many workers lived in temporary camps along the river, where they fished for cod, yellowbelly and catfish.



A temporary camp on the Darling. Image source: Wentworth Historical Society.

Despite a massive flood in 1890, a long drought saw the river dry by 1901. The overstocked land was damaged, blowing across the region as dust. Slowly the cattle market recovered and in 1938 the Tancred Brothers meatworks opened, processing 2 000 cattle a week.

The long decline in the wool industry was reflected in the area's economy while increasing mechanisation drastically cut the number of working people in the region. The cotton industry expanded in the late 1970s and boomed in the early 1980s, reviving the local economy.

Floods in the mid 1970s introduced carp from the south. Both cotton and carp brought their own challenges for native fish and the Darling River.



The Darling River. Photo source: Wellbeing Project DECCW.



Originally from Gundagai, **Gordon Brown** learnt to fish with his brothers and sisters on the family's annual holiday to Moruya Heads on the NSW coast. A chance job in Brewarrina as a young man has led to a life spent on the Darling. Photo: Cathy Simpson.



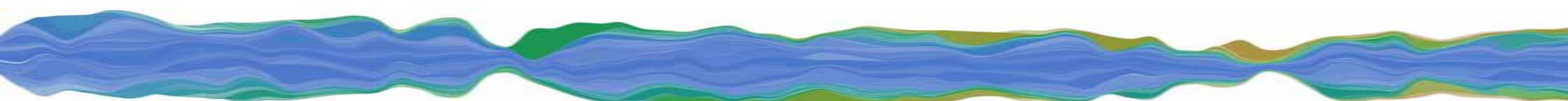
**Phillip Parnaby** was born and bred in Bourke. All of the family fished, either as part of large gatherings or on their own, like his Pop, who taught Phillip to fish. Photo: Jodi Frawley.



**Phil Sullivan** is a Murawari and Ngemba man. Fishing has always been a family and community affair and he's lived his life close to Ngunnhu, the Brewarrina fish traps. Photo: Jodi Frawley.



For as long as he can remember **Dwayne Willoughby** and his family have headed out to the river on weekends and school holidays with the tinnie, camp oven and as many kids and dogs as they can get into the cars. Photo: Jodi Frawley.



## Gordon Brown - *It all depended on the river*



Gordon was born in 1929 in Gundagai. He learnt to fish with his brothers and sisters at Moruya Heads on the NSW coast, when once a year the family would travel to the

beach in an old Chev Ford truck – Mum and Dad in the front and all the kids in the back under the canopy.

*In the early days we never had any fishing rods. We only used to use a green bottle or even a dead stick if it was stout enough. We would catch a few yabbies or dig a few worms. In those days you could set half dozen lines and no one used to take any notice of it. There was a good amount of fish in the rivers those days.*

### Fishing the Darling

When he was 27, Gordon was a truck driver on the interstate route. He bought a load of decking to Brewarrina to repair a bridge damaged in the 1956 floods. When the bloke who was supposed to lay the decking pulled out, Gordon got the job, and has been living near the Darling River ever since. After the bridge was repaired he and his wife (Gwen) worked at Caringle Station, Brewarrina, for seven years.

*When I first got married, before any kids came along, my wife used to say, "Do you want fish for tea tonight?" We'd go out mustering on the horses and come back that afternoon or night and she'd have fish waiting for us. You'd always catch a feed of fish, easy, in those days. There was a lot of fish about.*



The people of Bourke were used to dealing with floods – here an army vehicle transports people across the flooded Billabong Bridge in 1950. Photo source: Barton Collection, Bourke Public Library.

Gordon was one of many workers employed at Caringle. Fishing was not only a way to put food on the table, but the river was a place for recreation where newcomers could learn about the Darling from other station residents.

### *Big animals on the floodplain*

From 1835, grazing runs were established around Fort Bourke, doing well in good years when water and pasture were plentiful and folding after prolonged droughts.

The saltbush plains were covered with pockets of scrub and native grasses - fodder the cattle and sheep quickly depleted.

Stock trampled vegetation and eroded river banks as they went down to drink and cool off. The ongoing damage to and loss of native vegetation on the riverbanks and floodplains led to increased siltation of the rivers.

The drought of the 1890s, along with a worldwide recession, compounded these pressures on the river.

A 1901 *Royal Commission* focused on the damage done to the land by overgrazing in the previous 30 years. River species like fish had also suffered significantly due to the impacts of the drought and recession.<sup>1</sup>

The postwar years saw a conjunction of good seasons and high wool prices. Wool prices hit their peak in the 1950s, allowing smaller properties to be viable. Closer settlement brought more farmers into the area. However, by the late 1960s the pastoral boom had passed. Like much of inland NSW, this contributed to people moving away and a decline in population.

*We used to have a lot of Aboriginal people working there. They were characters, real characters. They were all a lot older than me. They'd go fishing with you, no trouble. You just go into the big deep holes or on the edge of a deep hole. It all depended on the river, heights and all that sort of thing too. We used to have a lot of fun.*

Spending time by the river Gordon learnt about all the different flows that would accompany the wet and dry seasons from upstream and how this would change the fishing conditions around Bourke. He noted fish not only lived in the river, but in all the backwaters too.

*I've seen fish in all these streams. They seem to go up them all, especially in the high rivers. There was a waterhole out in the place I was working at Brewarrina. When the river reached a certain height, as soon as it was up near the top of the banks, the water ran into it, there was fish in it. As soon as it stopped, well you'd go back to the holes and you'd still get a fair few fish out.*

A really low river sometimes called for ingenuity about the best fishing gear to use.

*There was a big deep hole and there was two great big cod in the water. They were doomed because the water was pretty stagnant. We got in with tennis court netting, you know, the big six-foot high netting? There was a guy on either side of the hole. We brought them up into the shallows and got in there and we just dragged the fish out. Oh, big, massive big fish.*



Droughts often led to the Darling drying to a series of pools. Fish survival depended on how long the pool remained. Photo source: WJC Collection Bourke Public Library.

## A pup, pup, pup noise

The floods of the 1970s brought plenty of water to the Darling River, but they also allowed the movement upstream of a newcomer that Gordon and other fishers had never had to contend with before – carp. Gordon recalls:

*You could see them in the water. It was just covered with this pup, pup, pup, pup noise. There were millions. We didn't know what they were. But we soon found out. They destroyed the catfish who used to build a nest in the river from bits of stone, or whatever he could find. And the carp would go along and they dribble their mouth in the mud and they upset the eggs. They probably eat the eggs. They upset the catfish' nests. Hence they're gone. Oh yes, they spoil the Darling. Which is a big shame, I think.*



When conditions are suitable carp can mass in their thousands. Gaping activity at the water surface is actually them feeding on zooplankton.<sup>15</sup>

Photo: Nathan Reynoldson.

## 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 'Boolara' strain from a farm in Gippsland that was released at Mildura and is now the most wide spread.<sup>13</sup>

Phillip Parnaby agrees with Gordon that the carp had an impact on particular fish in the river.

*There was catfish, we used to catch a fair few catfish, right up until the carp came along and that sort of pretty well buggered the catfish.*

Dwayne Willoughby is not old enough to remember the Darling without carp, but he too has seen the changes that they have caused.

*I've seen changes with the population in fish. When I was fishing as a kid, you could go down, catch yellowbelly, take it home, have it for dinner. Now you'd catch 20 carp.*



Carp move around in shoals in the shallow water of wetlands when they are looking to spawn. Often a single female is chased by a number of males.

Photo: Luke Pearce.



1974 flood levels at the Bourke Bridge. Photo source: Bourke Public Library.



2010 flood levels at the Bourke Bridge. Photo: Scott Nichols.



## Phil Sullivan – *the River's the essence*



Phil Sullivan, a Murawari and Ngemba man, was born in 1960 in Brewarrina. In 1966 the family moved between Dodge City in town and a camp at Billy Goat Bend on the Darling.

Both places are near Ngunnhu, the Brewarrina fish traps. Phil remembers fishing there as a youngster.

*There was good fishing there. Once the water got up to a certain height the fish just swam in. If the river got up too high over the fish traps, it was too strong then. They couldn't catch them with their hands any more, so they had to chuck the line in to catch them. They're still catching them in the fish traps right now.*

Ngunnhu have always been at the centre of Aboriginal economic and social life. Its abundant fish provided resources for the Ngiyampaa, their neighbours, the Murawari and Yuwalaraay, and for large ceremonial gatherings when many Aboriginal people could camp over for events such as the initiation of young men.<sup>2</sup>

### *Aboriginal fisheries*

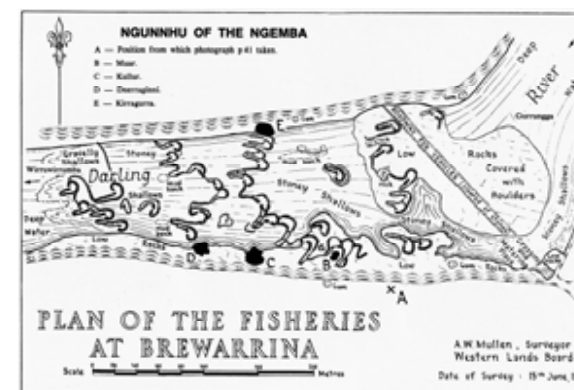
Ngunnhu, the Brewarrina Fisheries, are built over a length of the river where the bed falls steeply, so that the traps lie on different levels, with some underwater - even in dry conditions - ensuring harvests in all but the worst droughts.

In 1842 Aboriginal ownership was recognised in the gazettal of one of the earliest reserves in the state, covering Ngunnhu and a square mile of adjacent land. The gazettal prohibited non-Aboriginal people from fishing there. The local Aboriginal people and the police enforced this law until, at least, 1906.<sup>4, 16</sup>

Damage to Ngunnhu occurred in the mid 1800s when stones were removed to build a road across the river. A weir was then built on top of Gurrungga (the waterhole) itself in 1972.

At the time an attempt was also made to install a fishway over the weir by dynamiting a section of Ngunnhu. Both Aboriginal people and local white fishers were critical of this ineffective fish passage.

The weir is enjoyed as a swimming pool and picnic site, repeating the role that the perennial water hole Gurrungga had filled for centuries.



Local Aboriginal people knew their fisheries so well they explained the names of each of the stone pens to Surveyor A.W. Mullen who documented them in 1906.<sup>3</sup> Photo source: Goodall, 1996.<sup>4</sup>



The fish traps today looking from downstream. Photo source: Phil Sullivan.



Ngunnhu, the fish traps, are still used today to catch fish. Aboriginal people today continue to use the same technologies of stone pens to store fish for short periods after they have caught them in the main traps. Here some modern adjustments (above) ensure a golden perch (below) doesn't escape.  
Photo source: Phil Sullivan.



## The sweet things

Fishing was always a family affair.

*All the family used to go. There's Mum and myself, the second youngest, my sister's the youngest one and my brother was the eldest. It was always us four, and all the other family would come along. Extended family would come and we'd just sit down on the bank all day fishing.*

This was always a time of learning for the younger generation. Not just about fish and fishing, but also about the river, the plants that grew around it and the other sorts of animals that also depended on the water.

*We would all go and fish. But there was a lot of other things that happened. If it was too hot, we'd just jump in the river and have a swim. We would go looking for other little stuff. Maybe some quandong trees if they were in fruit. I remember one day the old fellas must have been checking the weather, checking the time of the year and they came across a native beehive. They just ripped the bark off and there was all this honey. All the kids were there doing a bit of fishing and getting some native bee honey. It was just awesome that day. That happened right back in the early '60s when I was a little fella.*

## Highs and lows

Over the years Phil has seen how the state of the river affects everyone who lives in Bourke and Brewarrina. The highs and lows of the river are also the highs and lows of the town.

*In the drought the crime rate in Bourke was way up, and the moment the rain came, and the river rose, the crime rate went down, because everybody had that connection to the river. When we get a big rain after a drought everyone went straight to the river. You're not just seeing blackfellas sitting on the river, you see kids sitting on the river bank, whitefellas, police officers, DOCS officers, everybody: fishing. It's the essence of our physical life, particularly to Aboriginal people. Without it, we're done. We're dead. So it just draws us.*

Another local, Phillip Parnaby, also remembers how freshes and small floods would turn the weir into the social hub of the town.

*We used to go down the Bourke weir when the river was rising and we'd all fish down there. Before the river got too high the yellowbelly were all hanging around below the weir waiting for the wall to go under so that they could move upstream. You could catch 15 or 20 in a day. There would be 100 people down there doing the same thing.*



Alma-Jean Sullivan ready to fish at the Bourke Weir.  
Photo source: Wellbeing Project DECCW.

### A little fish...

In the 1960s and '70s, Phil Sullivan remembers the Darling for its abundance of fish.

*Catfish. Black Bream. Cod. Yellow belly, they are the main four. There was this little fish, a blackfish, it used to be in the bulrushes along beside the river.*

Phil thinks that the floods in the 1970s – particularly the 1974 flood – completely changed the river.

*It was after the 1974 flood that the river started to change. When I came back from school, the little black fish was not there anymore. The bulrushes were their habitat. It had gone. It was a good little eating fish. Catfish, not there anymore. Black bream: very rare.*

Phil's cousin, Alma-Jean Sullivan, is renowned as one of the best fishers on the Darling River. She also noticed that the 1970s brought changes to the district.

*It was 1976, '77 I think they got cotton in Bourke. When they put all the cotton in and all the pumps in, they took all our water out of the river. So that was a big change for the river because every time we got a rise from up-river, they used to pump that water out before it got here. And then all our yellow-bellies were gone. There were hardly any fish biting in the river because all of the fish were being sucked into the pumps.*



Large scale developments like this one in Qld and NSW are often blamed for taking too much water.  
Photo: Scott Nichols.

## Silver perch

(*Bidyanus bidyanus* - grunter, black bream, silver bream, bidyan)



Photo: Barry Porter.

- Medium to large fish growing to 50cm and 8kg, but usually 35cm and 2kg
- Found in similar habits to Murray cod and golden perch (lowland turbid, slow flowing rivers)
- Spawning can occur without a flood, but these fish seem to benefit from raise in water level
- Fish move through fishways
- Eat aquatic plants, snails, shrimp, and aquatic insect larvae
- Potential threats include river regulation, barriers to migration, altered flow regimes, cold water pollution and interactions with carp and redfin
- Listed as 'Vulnerable' in NSW and the ACT

## Phillip Parnaby – Grandfather, father and father-in-law



Phillip, now 53, was born and bred in Bourke, growing up with his seven brothers and sisters a couple of blocks from the river. Phillip went to high school in Bourke, then straight to work at the

local meat works before becoming the milkman 30 years ago.

### Shoosh!

Although he thinks it was his Dad that taught him to fish, it was his Pop who he remembers as the family fisherman.

*My first memories of fishing are when I was probably four or five year old. My grandfather, who was a World War One veteran, used to go fishing but he wouldn't take us because we were too noisy. He'd come back with some of the biggest cod that I've seen. Mum would tell us stories about Pop. He'd drop Mum and Nanna off and then he'd go up the river and fish because they'd be too noisy.*

### A different Anzac tradition

In the 1960s and 1970s, Anzac Day was a special day of celebration for the war veterans that lived in Bourke. Like most Australian towns the dawn service was followed by a parade and then two-up at the RSL or the pub. Aboriginal returned servicemen were invited to march in the Anzac Day parade, but were excluded from entering the RSL: then, or at any other time of the year.<sup>5</sup> Phillip's Pop did not march.

*He had a brother who was a First World War veteran too. Pop was Aborigine. And in the beginning he didn't go to Anzac Day. He used to go fishing instead. He'd go away on his own the whole day, probably just because of the memories. He used to fish off the bank and also he'd row and use spinners too. He'd row up and down the river all day.*



Phillip teaching his son William about the river.

Photo source: Phillip Parnaby.

### The grass is always greener

As young kids in a country town, Phillip and his mates had to make their own fun.

*We had a pretty good life. When I was ten or twelve, there was plenty to do. The grass is always greener on the other side of fence. We would see people with new pushbikes and that sort of thing. There was eight of us in the family so there wasn't a lot of money to go around. But we had the river and there was heaps of entertainment.*

Other members of the family also fished – but usually not on their own like Phillip's Pop. Instead Phillip remembers that they fished in big family groups.

*We used to go with Dad. He'd go and set a few lines and we'd catch a few cod. My brother, Robert, who's ten years older than me, he's a big fisherman too. Later I married Ann Marie and her father was a keen fisherman. We used to do a lot of fishing together. When the kids were little, we'd pack up and all go out fishing, camping for the weekend. It could be anything up to 10 or 12 of us.*



Camping and fishing trips on the Darling gave Phillip a chance to spend time with his extended family.  
Photo source: Phillip Parnaby.

## Changes

Phillip's seen the river in all different kinds of conditions. In the 1990s drought started to dry out the river. The effects of the water storages and irrigation upstream started to show up in the Darling around Bourke.

*Well, you could see it in the water, it goes clear, right? And then it'll get stagnant and the algae came in. You could see the greens and the brown coming in, you'd know then it wasn't healthy.*

Seeing the changes in the river over his lifetime makes Phillip wonder about the longer term dry and wet cycles of the river.

*In 1938 the river was dry here. The Bourke weir pool went dry and they had to dig a trench from up river to get the water back down to the Bourke weir pool to replenish it. Mum lived between Bourke and the weir. It got that dry there they had their goats over the other side of the river looking for food. They must have had massive rain up north somewhere and it came down like a big wall of water. She said they could hear it coming. They had to go across and get the 20 goats back. In the last 50 years the river has never been dry like that between Bourke and the weir. Must've been a massive drought in '38.*



Unloading cargo at Bourke during a low Darling.  
Photo source: Wentworth Public School via Wentworth Historical Society.

## Murray cod

(*Maccullochella peelii* – Cod, Codfish, Guduu, Pondee, 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 100s 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



Photo: Luke Pearce.

## River trade on the Darling



River trade on a low Darling. Photo source: Wentworth Historical Society.

River-boats and barges began to move along the Darling River in the 1860s. Bourke became the largest inland port in Australia. When the rail-head arrived in 1885, Bourke became a hub for getting goods to market in Sydney.

Barges removed snags with steam-driven winches to make clear passages for larger boats. The water then moved along the channel faster, scouring the riverbed as it went.

By the time the weirs were built in the 1930s, rail and later road transport had replaced river trade.

The 1980s saw a rise in outback tourism. Bourke continues to be popular for its history as an inland port and transport hub.



Fish and other animals benefit from availability of new habitats during floods like those of 2010, especially when it gets out onto the floodplain (above). Birds like ibis take advantage of submerged lignum bushes to make their nests safe from predators (below). Photos source: Phil Sullivan.



## Importance of variability

Flows in the Barwon-Darling are highly variable, with 90% of all flows retained in the river channel, and only 10% reaching the floodplain.

Fish and other aquatic plants and animals have adapted to this variability and rely on it to survive.

Native fish use increases in flow as cues to undertake spawning migrations and to access different habitats, such as floodplain channels and wetlands.

The flow in a river controls the movement of materials like sediment, nutrients and organic matter and creates characteristics such as deep holes, sand bars, undercuts, and benches (flat sections of the river edge). These all provide habitat for different plants and animals.

The link between the floodplain and river is almost entirely dependent on variations in flow.

In muddy rivers like the Darling, light can't enter the water column to great depths, meaning the growth of water plants is limited. Here snags provide much of the structural habitat for fish.

In this type of system organic material from the floodplain becomes an important source of nutrients to the plants and animals living in the river itself.

River regulation (dams and weirs) and diversion of water (irrigation) decreases the variability of flows and therefore limits opportunities for different floodplain habitats to be accessible and materials exchanged.<sup>14</sup>

## Dwayne Willoughby – A Beemery shack for family and fishing



Dwayne was born in Bourke in 1976 and has lived there all his life. Family has always been central to Dwayne's fishing, since the very first day that he learnt to thread a worm onto a hook and cast out into the Darling River.

*My first memories were sitting there with my Nan and Pop and them saying to leave the worm on the hook, and leave it in the river. I kept pulling it out to see if I had a fish on the end of the line. That was a time when I always got to sit with my Nan and Pop and have a good old yarn to them, bit of a talk. I used to ask a thousand questions.*

He and his family have a fishing shack at Beemery – about half way between Bourke and Brewarrina. They head out on weekends and school holidays with the tinnie and the camp oven and as many kids and dogs as they can get into the cars.

*It's really great snags up that way. It's where the Bogan runs into the Darling. We're pretty lucky up there - it's what we call virgin territory. It hasn't been over fished, which is why we're really lucky. We don't tend to overfish it either.*

*We're not out there every week and we catch and release everything, anyway. We're pretty lucky to be fishing in these sort of areas.*



A yellow sheep tag attached to the tail allows this cod to be recognised if it gets caught again. Photo: Dwayne Willoughby.

### Sheep tags and fish

Dwayne and his family have always preferred to catch cod and yellowbelly. They normally take one or two smaller fish to eat and let the big ones go back to the river. They photograph most of the big ones and in the past five years have marked 47 fish with sheep tags. That way they can tell for themselves which fish live in the reaches around the shack.

It also allows them to see what the changes in the river are doing to the fish.

*Sometimes you'll get a cod that will have a few little sores, they're like a little mite, from what we can find out about them. We think that they are just a parasite.*



An anchor worm (*Lernaea* spp.) is just one of the parasites found on fish.

Photo source: <http://www.heems.nl/arob0409.htm>.

### Changing colours

The Darling River is famous for the changing colours of its waters – from milky tea colour in steady flow, to clear and green as the water slows, to muddy and dark when upstream floods bring raging waters.

The colours depend on which upstream river is in flood and carrying the silt down, whether it's the black soil from the eastern plains or the red soil from the west. Phil Sullivan explains some of the differences:



*When it rained in Bourke. Nice and clear. Beautiful. Drinkable water. You could actually put your head down there and drink it. Not murky and muddy. If it was water from the top end coming down, then it was the dirty coloured water.*



Clear water at the Bourke Weir. Photo source: Wellbeing Project DECCW.

Dwayne has noticed that the colour of the water changes the colour of the fish.

*When it was dry a couple of years ago the cod were not a very dark colour. I know in the last 12 months, because of the flows in the water, they now have a real dark appearance. They have changed. I don't know why but they are a different colour to when there's a fresh in the water. We sometimes go to a place called Black Rocks and there's some very deep water around there. I don't know if they get down into the rocks, into the deep water and just sit there. But the cod there are nearly black.*

## Sharing

Although they mostly release fish back into the river, the Willoughby family still like to take some fish to eat.

*All the time we go fishin, we've only taken four or five fish out of the water there. One year, two were donated to the local golf club for a pro-am. We also do try to give a fish to the Rivergum Lodge, the old people's home once a year.*

Phil Sullivan also remembers sharing his catch around.

*It was about us. It was about not just the family – my immediate family – but it was about all of us.*



Snags are an important of the river, providing protection and breeding sites for native fish like golden perch and Murray cod. Photo: David Cordina.

## *Fish and chips*

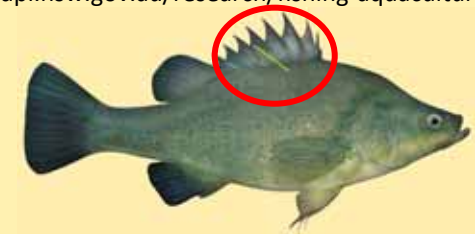
Fish tagging programs are widely used in scientific studies as a means of keeping track of fish movements.

There are several types of tags in use – external, internal microchips (passive integrated transponder or 'PIT') tags and radio transmitters.

Both external tags and microchips (PIT tags) need the fish to be caught or pass in close proximity to an automatic PIT tag reader in order for it to be identified.

Radio transmitters allow fish movements to be recorded without human interference (other than the initial capture and transmitter insertion). As the name suggests, fish fitted with radio transmitters emit a signal that can be picked up at permanent or mobile monitoring stations and downloaded to a researcher's computer.

Fish are being externally tagged as part of the Brewarrina to Bourke Demonstration Reach project to determine what habitats they prefer and where they move. If you catch a tagged fish, please let NSW DPI know by visiting our website to enter the tag details at: [www.dpi.nsw.gov.au/research/fishing-aquaculture](http://www.dpi.nsw.gov.au/research/fishing-aquaculture).



Golden perch with a yellow external tag near its dorsal fin (circled) which will have a unique number and contact details for you to get in touch with researchers.

Photo: NSW DPI.





Like Dwayne's sheep tags, external tags (being inserted – top right hand corner and circled above) allow fishers and scientists to identify individual fish. Care must be taken when tagging all fish as the wound can easily become infected. Photos: NSW DPI.



Anti-clockwise from top right: Internal microchips, shown being inserted into the fish's body cavity under anaesthetic, can also be used to identify fish using handheld scanners (bottom right) or as fish pass scanning stations located in fishways. Photos: NSW DPI.

Dwayne and his family stick to the main river channel – even when the water fills all the lagoons, wetlands and creeks that run into the Darling. He explains why they don't fish in the backwaters:

*We leave that, because that's where they're breeding, up in the shallow lagoons. That's not for me, you know. It's always been the river. We don't touch the lagoons. That's been passed down that the lagoons are the fish's breeding ground. That's your bread and butter for future fishing.*



Darling River in flow at Brewarrina Weir, submerging Ngunnhu. Dwayne likes to fish up the river closer to Brewarrina too. Photo: Scott Nichols.

## *Fish parasites*

A number of parasites and diseases affect native and introduced fish. One of the more visible is an 'anchor worm' (*Lernaea* spp). Anchor worms are actually an ectoparasitic copepod, which means they are a parasite living on the outside of the fish and are actually a type of tiny crustacean (like a crab or shrimp).

*Lernaea* spp. progress through 3 free swimming life stages before entering a fish through its gills. When sexually mature, the females are fertilised and move to the fish's skin where they secure themselves by burying their now anchor-shaped head into the skin. Where the female detaches from the fish, an infection can occur, leading to ulcerations.<sup>11</sup>

Like all parasites, their abundance is often a sign of stress for the host. A long term study of fish communities in the Lower Darling noted an increase in proportion of fish affected by anchor worm between 1994 and 2009,<sup>11</sup> but lower levels in 2010.<sup>12</sup>



A big cod with what are probably ulcerations from parasitic *Lernaea*. Photo: Dwayne Willoughby.

## Making connections

Feli McHughes is a Ngemba man on a mission. He wants to continue to rehabilitate the Old Brewarrina Mission Wetland with the Ngemba Billabong Restoration and Landcare Group and integrate it into other activities for the local Aboriginal people.<sup>6</sup>

*About 15 years ago one of the government agencies decided to pump water into a billabong that was two kilometres long, just to see what would happen. We had no science or anything. We just allowed the billabong to demonstrate it's natural forces. It was awakened and nature seemed to understand that something was happening there. So birds and fish and all the appropriate wildlife around billabongs started to get involved again. It dawned on me that billabongs were very important part of the river system. I'm saying that it actually develops antibiotics for the rivers' immune system. Should the billabongs be activated, then the river's immune system will have a chance to develop and get stronger and then we have a healthier river.*

### Circle that never stops

Phil Sullivan explained the special Ngemba - Murawari relationship that his family have with the yellowbelly.

His example shows how the stories are about places and people at the same time. He talks about places as having brothers and sisters in the network of connections through the stories - and also about living people, whose family responsibilities link them to places and to other living creatures.

*I think traditionally, everyone would have had a responsibility. My family's totem was the yellowbelly, and so our responsibility towards the Yellowbelly was in the water, in the river and everything about the river. That would entail looking after the river, but also looking after the sister who's totem was the little lily on the river. There was a circle that never stopped. The reeds might have been important, or maybe, there was a responsibility to look after the Brolga. The river has always been important because it holds the essence of life, which is the water.*

Through his job with Bourke Shire Council Dwayne Willoughby has been able to help with some of the programs going on in the area including the Bourke to Brewarrina Demonstration Reach project. He says:

*We had a big program doing a re-snagging project in Bourke. It was great for the river.*

### Golden perch

(*Macquaria ambigua* - callop, yellowbelly, Murray perch, white perch)

- Grows to 76cm and 23kg, but usually less than 40cm
- Likes warmer, slow moving waterways, floodplain lakes
- Found around fallen timber, undercut banks, rocky ledges
- Occupy a territory of about 100m for several months before moving to a new home range
- Known to migrate over 1 000km in spring and summer
- Migration cued by warmer water and rising water levels
- Eggs drift downstream on floodwaters
- Eat shrimp, yabbies, small fish and aquatic insect larvae



Yellowbelly caught at Bourke. Source: Wellbeing Project DECCW.

## We need to protect fish

Mick Davis lives on a family farm on the Darling River about 40 minutes out to the west of Bourke. They have farm stay accommodation that attracts fishers from all over Australia.

*We need to protect the fish that are there. And protect the banks and the water. The water is needed for household purposes, stock and domestic use. I believe once the river comes down well, the flow can run, fill up quicker. What Dave Cordina's trying to do now is to get good fishways all the way through. I think that's very important.*

Aboriginal community organizations have successfully undertaken rebuilding programs with young people working to restore the remaining fish traps. Today the Aboriginal Museum in Brewarrina retells the story of Ngunnhu's creation and its ongoing importance to the Ngiyampaa and to everyone of the region. Aboriginal people today take an active role in the annual Brewarrina Festival of the Fisheries, with celebrated Murawari elder, the late Essie Coffey, saying in 2000 about their participation in this event:

*The Kuris themselves wanted to do something because this is our fisheries, our fish traps.<sup>7</sup>*



This installation at Brewarrina Information Centre shows how important the fish and fish traps are to the local community. Photo: Scott Nichols.

## If you catch a fish it's a bonus

Dwayne explains what it is that he loves about fishing with his family.

*I just like the wide open spaces and you can forget about things. It's a good time to relieve stress, I suppose. When I was a kid it was a bit different, it was the thrill of catching a fish, thrill of just being out in the outback. You could pick up a rock, throw it in the water, or get a stick and light a fire. But now it's changed. Its great just to get away and relax and lay on the banks, listen to the birdlife, a couple of cold beers and good mates. We always seem to have good mates when we go out. I like being with my family. If you catch a fish it's a bonus.*



Feli McHughes sees the rehabilitation of Ngemba Billabong as part of the process in developing a healthier river. Photo: Feli McHughes.



Just being on the banks of the river relaxes you. Photo: Jodi Frawley.

## Visions for the Upper Darling

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.

### Water is the essence

Phil Sullivan is a delegate on the Northern Basin Aboriginal Nation group that are working with the Murray-Darling Basin Authority.

*For Aboriginal people, water is the essence. We argue and fight not because there's an economic base for us, we argue and fight because we have a responsibility. We want to look after the water, look after the river, and look after everything around it. We get obstreperous and row and argue because we see it being destroyed, we do see it being abused. We do see it in a sad way, you know. Not good way.*

The Bourke and Brewarrina areas do not have too many fishing inspectors. Dwayne Willoughby thinks that one way to ensure that people do the right thing of their own accord is through education.

*It's hard because the rules don't get enforced a lot out here due to our locality. We should continue to educate the people about catch and release fishing. I think a lot of people just take it on board and say, "oh, ok, we're in the same boat, we've got to release the fish because we want to be able to come back here in another five years and catch one."*

### It's a big thing to us

Phillip Parnaby owns one of the motels in North Bourke and understands that a healthy river will mean that many different sorts of people can stay in the Darling River area.

*I say we have got to look after the river because it's a big thing for us. It's a big thing for our future. Two of my sons are heavy vehicle mechanics on cotton farms. So, it's given them a future. And my other son, one runs a milk run, and one has his own truck. So, it all creates an industry of Bourke. I believe that when the fishing people come to fish, they come to see the outback. And it's all got to be sustainable or we won't have Bourke.*

### Dancing the billabong's tune

Feli McHughes sees the interconnectedness of the animals in the river as a vital link.

*I think that fish will have their natural role in the future of the billabong. We're still to define what that is, but like anything, the swallows, the rainbow birds, frogs, the trees and the weeds, and the grasses, well fish fits in with that whole process. They're an integral part. If one little bit's missing, then the billabong isn't complete. So we need to make sure that everyone is dancing to the billabong's tune.*



Everything is interconnected – fish are an important food source for many creatures including the elusive water rat, whose tracks in the mud are the only thing to give its presence away. Photo: Scott Nichols.

## The people's river

Alma-Jean Sullivan is a Wangkumara woman who has a reputation across the whole of the Western plains for her prowess as a fisher. A calendar with her fishing tips has been reprinted three times and the 'Paroo Queen' has won the local fishing competition for a number of years, beating other recreational fishers from far and wide. When asked in 1997 how the river might be fixed, she replied:

*Well, I would stop the cotton for a start. I'd just stop them taking so much water out. Let them take the water out when the rise gets down properly. When the rise is getting to the Darling River, they start pumping the water out. And it takes so much water, millions and millions of gallons of water out of the river, into the channels and I don't think that is right. I'd like to see them stop the pumping, let the water come down, give the fish a bit of a break, get used to it and let the town people get back what is ours! It's for everyone, not just for Aboriginal people, but for white people too. It's a lovely river when it's running... so the people should have a fair go.*

## State of the river 'moderate - poor'

The Sustainable Rivers Audit (SRA) is an ongoing systematic assessment of river health of 23 major river valleys in the Murray-Darling Basin. Environmental indicators (themes) include hydrology, fish and macroinvertebrates, which are monitored and will highlight trends over time.<sup>8</sup> The Darling Valley was surveyed in 2005. The Darling Valley fish community in the 'Upper Zone' was considered to be in Poor Condition and Ecosystem Health overall in Moderate Condition within this zone.

A little under half the native species predicted for this zone were collected during surveying (47%) with alien fish comprising just over one third the fish biomass (35%).

Bony herring dominated the fish catch during sampling, with Australian smelt, carp gudgeon and spangled perch also numerous. Golden perch and Murray-Darling rainbowfish were also common. Three alien species, Eastern gambusia, goldfish, and carp were captured frequently.



Eastern gambusia (circled) are a pest fish now found throughout the Basin. They were introduced to control mosquitoes, a job actually done much better by native gudgeons. Photo: Charlie Carruthers.

## Pumping water, not fish

Irrigation pumps and drains are a problem for fish. Up to 200 fish can potentially be extracted daily from the river through high volume irrigation pumps. These fish are removed from the natural system with little chance to return to the river, effectively being 'lost' from the main river channel. This situation has a major impact on the health of native fish communities in the Murray-Darling Basin.<sup>9</sup>



Some of the more resilient native fish species, such as spangled perch and bony bream, are able to live in storages, but their ability to return to the rivers and contribute to their natural community is lost.

The issue is not new – back as early as 1928 the Inland Fisheries Officer of NSW recommended:<sup>10</sup> *Screens should be installed at all irrigation and other pumping plants having not more than half an inch perforation to minimise the destruction of fish life.*



Research is continuing into the effective use of screens. Photos: NSW DPI.

## 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) Brewarrina to Bourke Demonstration Reach**

This Demonstration Reach is being managed by NSW DPI Fisheries in collaboration with the Western Catchment Management Authority.

NSW DPI and the Western CMA have worked with landholders around Brewarrina and Bourke to undertake activities like resnagging the river, controlling gully erosion and planting riparian vegetation.

Demonstration Reach works also aim to minimise the effects of fish passage barriers and pest fish on native fish so that they can undertake breeding migrations within the Barwon-Darling and have decreased competition from introduced species.

If you would like to get involved or want to know more, contact David Cordina on (02) 6681 1277.

### **(b) Ngemba Billabong Restoration and Landcare Group**

The rivers, lakes and floodplains of Brewarrina Ngemba Billabong are a significant historical and cultural site for the Ngemba Aboriginal people.

From 1876 to 1967 the Ngemba Billabong was the Brewarrina Aboriginal Mission for local Aboriginal people whose land was taken for grazing. Prior to this, Brewarrina was an important tribal meeting place.

The land is now listed on the NSW State Heritage Register as an Indigenous Protected Area and cared for by the traditional owners. While managing the river, floodplain and wetland, special emphasis is placed on educating members of the community about traditional values, Aboriginal history, and social inclusiveness.

To find out more about this project or to get involved, contact the Ngemba Billabong Restoration and Landcare Group on (02) 6872 2144.

### *Aboriginal language groups*

The Darling River and its tributaries have always been important to the local Aboriginal people with a number of Aboriginal language groups found in the region.

The attempts of early European settlers to translate the names of Aboriginal nations and language groups into English led to variations in how these names were spelt.

Despite the different spellings, all Aboriginal languages have some key rules about pronunciation which are used to develop the written word so they can be pronounced the way they really sound.

Firstly the first syllable is stressed. Secondly there are only 3 vowels - 'a' as in 'cup', 'u' as in 'put' and 'i' as in 'pin'. Where the vowels are held longer they are written doubled (eg Ngiyampaa). Lastly, 'p' and 'b'; 'k' and 'g'; and 't' and 'd' can be used interchangeably as they are not distinguished in most Aboriginal languages.

The following variations for language groups are used in the Upper Darling: Baarkindji / Barkindji / Paakantyi / Paakintji (Darling up to Bourke), Ngiyampaa / Ngemba (Darling and Barwon - Bourke, Brewarrina), Murawari / Murrawari / Moruwari (lower Culgoa), Yuwalaraay / Yuwaalaraay / Euahlayi (Narran, Bokhara), Gamilaraay / Gamilaroi / Kamilaroi / Guyinbaray / Juwalarai (Barwon, Namoi, Gwydir).

In this booklet we have generally used Ngiyampaa, Murawari, Yuwalaraay, and Wangkumara (western NSW). However, where an interviewee has a spelling preference, this was used in their profile.

## River resources

- Native Fish Strategy Coordinator (Northern NSW)  
Anthony Townsend: (02) 6763 1440
- Brewarrina to Bourke Demonstration Reach  
Coordinator David Cordina: (02) 6881 1277
- Ngemba Billabong Restoration and Landcare Group:  
(02) 6872 2144
- Western Catchment Management Authority:  
(02) 6872 2144
- Northern Basin Aboriginal Nations: (02) 6279 0672
- Bourke Public Library: (02) 6872 2751
- Brewarrina and District Historical Society  
(via Brewarrina Tourist Information Centre):  
(02) 6839 2152
- Australian National Library: [www.nla.gov.au](http://www.nla.gov.au)

### Abbreviations

CMA	Catchment Management Authority
DPI	Department of Primary Industries (NSW)
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 Basin: Namoi River (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](http://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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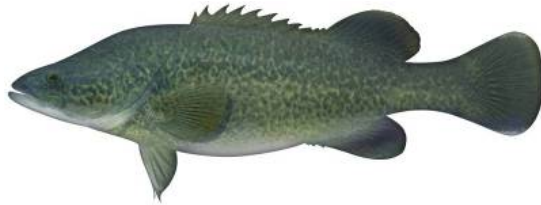
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# Some fish of the Upper Darling and Barwon Rivers

Native  
(not to scale)

Murray cod / Cod



Golden perch / Yellowbelly / Callop



Catfish / Eeltail catfish / Jewie



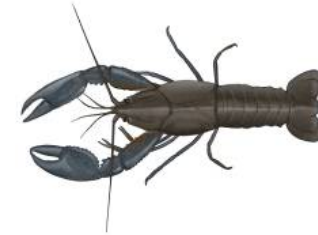
Silver perch / Murray bream



Spangled perch / Bobby cod



Yabby / Craybob



Introduced  
(not to scale)

European Carp / Common carp



Goldfish / Gold carp

