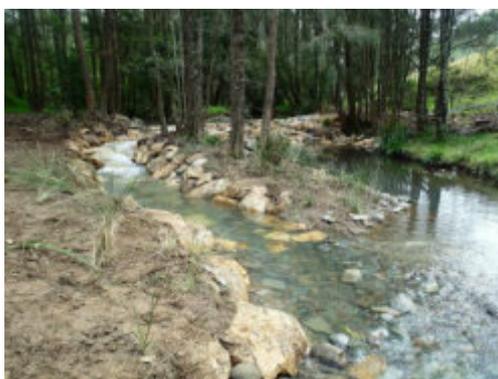


## AUSTRALIAN NEWS

### How to build a fishway

The completion of a fishway has removed the final non-natural barrier to fish passage from the Bowman River, near Gloucester, NSW. In addition, areas of bank and bed erosion caused by a scour pool that itself was caused by the redundant barrier were fixed and riparian vegetation replanted. A picture by picture sequence documents how the project unfolded and can be viewed [here](#).



Heavy machinery in a creek – good news when it's keying rock in to stabilise the bank and preparation for the construction of the fishway. Images: NSW DPI Soil Conservation Service

### And why would you bother? Let there be fish!

A World Fish Migration Day 2014 event was held to celebrate the new fishway on the Lane Cove weir, Sydney. Local fishing club, Bass Sydney, have been involved in this and a series of similar projects to improve Bass habitats. Since the fishway was installed they have seen the benefit for this iconic native species. Their catch and release records have shown an increase in fish numbers upstream, confirming the important role open rivers play in sustaining native fish species. [More](#).

### What fish want

Researchers have been looking into exactly what habitats adults of Murray Cod, Trout Cod and Golden Perch and the introduced Carp use during the day. Prime habitat for all three species includes snags and deeper, slower water close to the bank. The water depth where the woody structure was found was also important. Both Murray Cod and Trout Cod were more comfortable in faster water further from the bank than Golden Perch. One feature that both Carp and Golden Perch prefer is structural woody habitat that extends higher into the water column. For more information on this research by Koehn and Nicol in *Marine and Freshwater Research*, [here](#).



Prime habitat for Murray Cod, Trout Cod and Golden Perch. Photo: Liz Baker.

## Habitat = fish? The proof is in the (electro)fishing!

A tour of the Powlett River catchment, in the West Gippsland area of Victoria, has highlighted the benefit of vegetation along stream and river beds in improving fish habitat. The Powlett River mouth and estuary is a much loved place for fishing, walking and swimming. Almost 50 people took advantage of a tour organised by West Gippsland Catchment Management Authority and the Bass Coast Landcare Network to learn more about one of their favourite places. The tour took in near pristine and degraded sites along creeks flowing into the Powlett River. Participants saw first-hand, with the benefit of electrofishing, that where the riparian vegetation was good, there were lots of fish and a number of fish species. Nothing was caught at the degraded sites. [More](#)

## Prime fish real estate at \$230 000 a hectare

Seagrass habitat in southern Australia is critically important as a fish nursery and researchers are now able to put a dollar value on the benefits of seagrass restoration for fisheries. The researchers argue that their figure of \$A230,000 per hectare per year is conservative and likely to be an underestimate. One of the reasons why is because they had to use commercial fish catch data only and acknowledge this means that a number of potential species were excluded from the economic analysis due to insufficient data. The cost of seagrass restoration efforts is highly variable and previous studies have suggested that seagrass restoration may be too expensive to be economically defensible. Given the data now available, the researchers show that some restoration programmes may in fact be economically justified with payback times as low as 5 years. Read more about this work by Blanden and Ermgassen in *Estuarine, Coastal and Shelf Science*: <http://dx.doi.org/10.1016/j.ecss.2014.01.009> or read a summary by [National Geographic](#).

## Condamine fish reaping the benefits of habitat works

Recent monitoring in Queensland's Condamine catchment as part of the Dewfish Demonstration Reach and the Northern Basin Tilapia Exclusion Strategy project shows a strong increase in the native fish population in response to vast improvements in the health of this river system. Murray Cod and Golden Perch are using the fish hotels that were installed and there has been a massive increase in Murray Cod numbers. More good news is that there no evidence of Carp recruitment within the Reach. [More](#) (scroll down)



The delivery of new habitat for fish in the Condamine has resulted in a strong increase in native fish numbers. Image: extracted from *Dewfish Demonstration Reach Final Report 2011*.

## Sweet news for Sugar Shack Wetlands

The Sugar Shack wetland was reconnected to the Murray River in South Australia in January 2014 after a managed dry phase in 2013. A structure was built at the inlet of the wetland in 2007 to manage the wetland and mimic more natural and variable water levels. The managed drying and refilling has resulted in a dramatic reduction in invasive carp numbers thanks to the carp exclusion screens fitted to the inlet structure. [More](#)



The Sugar Shack Wetlands looking back towards Yatco Creek, the link to the Murray River. Image source: [www.midmurraylap.org.au](http://www.midmurraylap.org.au).

## Seabreeze action at South West Rocks

Seabreeze Beach Hotel Fishing Club is a small fishing club based at South West Rocks, on the NSW central coast. The club fishes locally and noticed the damage being done to saltmarsh around a popular fishing spot. Being interested in working to improve fish habitat in the local area, they decided to fence it and the adjacent area of mangroves off to traffic, thereby protecting this local habitat that support local fish. [More](#)

The only heavy traffic members of the Seabreeze Fishing Club want to see on this area of saltmarsh is the vehicle that's going to help them protect and repair it. Photo: Peter Askew



## Habitat + water = happy home coming

Environmental flows were used to help recently translocated Macquarie Perch feel more at home in the Ovens River, northern Victoria. The additional water will allow the fish to move more freely between areas of rejuvenated habitat, as well as refreshing the instream habitats that the fish's food sources need. As well as Macquarie Perch, other native species, such as Trout Cod, Murray Cod and Golden Perch, will also benefit. [More](#)



Glen Johnson, DEPI, with one of the Macquarie Perch making the Ovens River home. Photo: DEPI

Autumn environmental flows have also been assisting fish in other Victoria waterways. Grayling numbers have increased after previous releases into the Thomson and Macalister Rivers and this season's release into the LaTrobe River is welcome news for fish. [More](#)

In northern Victoria, Gunbower Forest, the Lodden River and wetlands on private property are also getting a drink. Gunbower Forest is receiving environmental water for the first time through the newly constructed Hipwell Road Channel infrastructure. Follow this link to listen to a [ABC radio interview](#). For more on these and other flow deliveries that will benefit fish in northern Victoria, [here](#).

## Fish travelogues from the Alligator River

Researchers are using radio tracking to find out when and how Barramundi and Fork-tailed Catfish are using the habitats of the Alligator River, Northern Territory. The Alligator River system is the largest in Kakadu and contains extensive wetlands that include river channels, floodplains and backwater swamps. One fish, a barramundi, has been tracked moving between billabongs, up-and down-stream, into and out of flooded side-channels, and making journeys of 30 kilometres in a few days. Six months after being tagged it was located 70 metres from the place where it was tagged!

[More](#)



Finding out how fish use habitats within the Alligator River. Photo: [www.nerpnorthern.edu.au](http://www.nerpnorthern.edu.au)

## South-east Queensland catchments on the front line

River catchments in South-east Queensland hold a special value when it comes to freshwater biodiversity in Australia. They contain the highest level of species richness and/or endemism (only found locally) in Australia of freshwater lungfish, gobies, catfish, rainbowfish, eels, bass, and several types of insects and molluscs. Unfortunately, they are also being degraded by processes associated with increasing urban population, including too much nutrient input, over-extraction of water and flow regulation. The loss of 75% of the native vegetation in SEQ has also contributed to declining water quality and loss of aquatic biodiversity. Researchers have looked at likely impacts of climate change and of mitigation, such as riparian buffers. The good news coming out of this study was that the restoration of riparian vegetation was identified as an important tool for adaptation that can mitigate the negative effects of climate change and land-use change on aquatic life, including fish. [More](#)

## Rock fillets for fish fillets

River bank stabilisation structures called rock fillets have recently been built at a number of sites between Mylestom and Raleigh on the north coast of NSW. Rock fillets protect river banks from erosion by reducing the wave energy hitting the banks. They also provide an area of slow or still water which is good news for fish as these become areas where sediment settles and mangroves regenerate, which means nursery habitat is created. Weed control and revegetation along 500m of the river bank have added to the river health benefits of this project. [More](#)

## And root balls too

Tuross Heads, in southern NSW, is another community getting serious about improving their local fish habitat. They have been busy, getting root-balls in place at the river edge, spraying adjacent riparian areas, installing bollards and planting shrubs and trees. All of these will help stabilise the river bank and make a contribution to improving habitat for fish. As well as the local council and the Tuross Heads Fishing Club, other volunteers came from the men's shed, community gardens and the preservation group, marine rescue, rural fire service, golf and bowls clubs. Together they dug 570 holes, planted the trees and shrubs, installed the wind guards and gave all a drink; all in just three hours! Great effort. More information [here](#).



A superb effort for the benefit of fish from volunteers across the Tuross Heads community.

Left – one of the trunks that will help reduce wash damage.

Right – the happy project team after they had finished planting 570 native plants with the help of the many volunteers.

Photos: Max Castle.

## Sandbags to the seagrass rescue

About 2,000 hessian sandbags are being dropped into waters off Grange, near Adelaide, South Australia, to allow more seagrass seeds to take root and grow. The high levels of water and sand movement in this area mean transplanted seedlings, which is the traditional method, get washed away. In areas where the hessian bags have been spread previously, thriving seagrass has been found more than five years later. It is estimated more than 5,200 hectares of seagrass have been lost along the Adelaide coast since the 1950s. Given the valuation of seagrass at \$230,000 per hectare (see article above) rehabilitating just the area that was lost will add significant value – and fish - to this fishery. [More](#)

Seagrass meadows are the feeding grounds for King George Whiting and Garfish, among others. Photo: SARDI



## Tupong celebrating one year later

The installation of a fish ladder on the Glenelg River at Sandford, northern Victoria, last year has been good news for many fish species, including the Tupong, a species that is a good indicator of river health. The fish ladder is situated just downstream of the confluence at the Glenelg and Wannon Rivers and has opened up these major waterways and their tributaries to many migratory fish species, including Eels and Estuary Perch. The fish ladder, in conjunction with environmental flow releases coordination with native fish migration behaviour, has enabled fish to extend their distribution back into their traditional habitats in this river system. [More](#)



Tupong need to migrate from salt to freshwater and return to complete their life cycle. The fish ladder has opened up 300km of habitat. Photo: Vic DEPI

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## INTERNATIONAL NEWS

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### It might look like a carp but it's not and it's in trouble

Crucian might look to the untrained eye like a carp but it is a separate species. Also known as 'Crucian Carp', it is a native of Europe and the UK and thrives only in still water – and it is in trouble. A conservation project has been launched to 'help reverse the worrying decline of one of the nation's most loved fish'. Small ponds of northern Europe are important refuges and Crucians are often the only fish species present in them. Over the past thirty years many of these farm and village ponds have disappeared. This project will promote the conservation of the species and its habitat. [More](#)



The Crucian, a native carp type fish that is now the focus of conservation efforts. Image: www.crucians.org

### After 40 years, it's time to let the fish in

The Derwent River, in Yorkshire, England, is now open for fish for the first time in 40 years. The act of opening a barrage on the river for just eight hours a day allow thousands of salmon and sea trout migrating along the Ouse from the North Sea to enter the 115 km river and its tributaries. It is estimated this will support a fishery worth at least £12.5 million (A\$22.5m) a year to local economies. The Derwent is Yorkshire's largest river system covering 2,057 square kilometres and is ideal habitat for spawning. The last time salmon were reported in any numbers in the Derwent was in 1976. [More](#)

## Focus on fry

A refuge for Trout fry has been created on the Kennet River, Berkshire, UK. The Kennet is a good Trout river with good quality water, but recruitment was limited by the loss of habitat for fry. The local fishing club teamed up with the UK Environment Agency to rebuild the quiet, shallow water areas on the edge of the main channel that the fry need, especially during high flow events. These localised refuges will now provide the habitat fry can use to survive and thrive from year to year. [More](#)



The Kennet River is a fly fishing favourite. The native Kennet Trout, known as the 'greenback', is now a much sought-after rarity. Image: [www.fishingbreaks.co.uk](http://www.fishingbreaks.co.uk)

## Natives respond to natural flows

A 30 year study of the fish community of the Bill Williams River Basin, a dryland river system in Arizona, USA, found that natural flow regimes are important to support native fish species. Non-native species had proliferated in this system, although native species were present. After an experimental flood, the researchers observed a short-term reduction in the abundance of non-native species in sites close to the dam, but within 8 days, the composition of the fish community returned to what it had been before the flood. The small-bodied fish, however, did not recover as well and remained at the lower population density that resulted from the flood. More on this research by Pool and Olden in *Ecology of Freshwater Fish* [here](#).

## 'River of the dammed'

Researchers found significant differences among fish community compositions at sites in impounded and free-flowing sections of the Allegheny River, Pennsylvania, USA. They found higher fish abundance and taxonomic diversity at sites in the free-flowing section of the river. While fish assemblages were different above and below dams, the lack of similarity between what they found in reaches below dams and in free-flowing sites was contrary to what they had expected. The research also identified that fish relied on different nutrient sources in these different areas of river. In the free-flowing areas, fish relied on nutrients derived from the benthic zone, while those in dam-impacted sites relied on nutrients in the water column. More on this research by Freedman and others in *Hydrobiologia* [here](#).

## Dam removal for Shad

US researchers have found that removing a dam improves survival rates for American Shad adult fish, juveniles and eggs. American Shad spend most of their adult lives in saltwater, but return to freshwater to spawn. The adults do not feed in freshwater, so many die before they have a chance to return to the ocean. By tagging adults, the researchers were able to tell how far upstream the fish travelled and what habitat they were using. They found that the Shad were using all of the restored habitat but the longer it took them to reach the preferred habitat, the more weight they lost and the more likely they were to die before spawning. Dams and other obstacles slow the fish's progress, so improving fish passage will mean more fish reaching spawning grounds in better condition. You can read more in this [summary](#) or the [research paper](#) by Raabe and Hightower in the *Transactions of the American Fisheries Society*.

## Coastal restoration bringing home the fish

Coastal ecosystems are some of the United States' most important and vulnerable natural resources. Their degradation reduces ecological services that provide widespread benefits for local communities. The US National Oceanographic and Atmospheric Administration has provided US\$167 million for coastal restoration projects since 2009, an evaluation of which is now [available](#). One of the highlighted projects was the [South San-Francisco Bay Salt Pond Restoration Project](#), the rehabilitation of approximately 7,500 acres of commercially - productive salt ponds to tidal marsh. Within three years of restoration commencing, individual ponds (approximately 620 hectares) are beginning to provide vegetated marsh habitat. The numbers and diversity of fish have shown a positive response due to the increased habitat availability and increased range of environmental conditions.



The installation of tide gates, such as this one, might not look exciting, but the analysis found that the combined economic output from project spending and the long-term ecosystem service benefits outweigh the cost of investment by more than 15 to 1. Image: NOAA

## A forest for fish

The 17 million acre Tongass National Forest, Alaska, US, is not only the largest national forest in that country it also produces exponentially more value in fish than it does in timber. It is known as a 'salmon forest' because the roughly 17,000 miles of clean, undammed creeks, rivers and lakes provide optimal spawning and rearing conditions for wild Pacific Salmon and Trout. Salmon alone generate nearly a billion US dollars to the Alaskan economy and the wild Salmon spawned and reared in the Tongass National Forest represent approximately 30 percent of the Salmon caught on the West Coast of the United States and close to 13 percent of the Salmon harvested on the Pacific Rim. It is however the site of a battle of economies between timber and fish/tourism. The questions of how to get fish onto the decision-makers' spreadsheet are explored in this [article](#).



The fish that recruit in the Tongass National Forest fishery support local recreational, tourist and commercial fishing as well as fishing throughout the Pacific Rim . Image: [www.wadingroom.com](http://www.wadingroom.com)

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## SPECIAL NOTICE

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### Be part of the answer

Members of the international recreational fishing community are invited to participate in an survey about fishers and habitat being hosted by Australia's Fish Habitat Network.

Quality fish come from healthy populations enjoying good water, plenty of food and access to habitat. When we have dams, denuded riverbanks, culverts, dredged gravel beds and poor water quality we don't have healthy fish. Many organisations – and individuals - are working to improve fish habitats and this involves all of us. However, we need your help. To improve what we do, we would like to know more about you, what you know and what you think about habitat.

We are taking part in an international survey with counterparts in the USA, Ireland and the United Kingdom. The survey should take no more than 5 minutes and is available by clicking [here](#).

All the information is anonymous and not related to your email address. We are pleased to offer prizes in Australia, the USA, UK and Ireland. There's a link at the end of the survey that takes you a separate, unlinked page where you can enter the draw for these great prizes.

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## RESOURCES

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### A guide to Blue Carbon

Blue Carbon is a term used to describe the climate change mitigation benefits of preserving, protecting, and restoring coastal habitats. *Building Blue Carbon Projects: An Introductory Guide*, aims to stimulate discussion regarding blue carbon projects that support the conservation and restoration of coastal ecosystems. Read more and download the report (4.5Mb) [here](#).

### Beneath the waterline

Jack Perks is a wildlife photographer on a mission to bring the UK's freshwater fish into focus. He argues that freshwater fish are very much out of sight out of mind. His videos are available [here](#).

### Field guide to common saltmarsh plants of Queensland

The Field guide to common saltmarsh plants of Queensland is free and has identification keys for the 32 most widespread saltmarsh species in Queensland's coastal zone. More information and ordering [here](#).

### RipRap

Edition 37 of RipRap, *Rivers of Carbon – Rivers of Life*, focuses on the multiple benefits that can be gained from river and riparian restoration. You can order or view the Table of Contents [here](#).

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## FROM THE ARCHIVES – IT SEEMED LIKE A GOOD IDEA AT THE TIME

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### More oysters meant fewer mangroves

In 1900 the majority of oyster growers on the NSW coastline relied on the natural foreshore for the opportunistic settlement of spat (juvenile oysters less than 25mm). When the *Fisheries Act 1902* commenced, oyster lessees were required to lay down suitable material to maximise the collection of spat. Laying down sticks cut from the River Mangrove became a favoured technique, but by 1909 the Fisheries Officer at Camden Haven reported: "*heavy inroads made on this material has almost exhausted the home supply ...*". What happened next? Pat Dwyer, Fisheries NSW, [explains](#).

### And so it came to pass ... or not, in the case of fish

*[M]ore and more dams will be erected, until there will be many hundreds of such throughout the length and breadth of the land. Without the provision of fish-passes there is a grave danger of fish fauna being cut up into isolated colonies...* (NSW Department of Fisheries 1913)

Despite the early warnings from our colleagues over 100 years ago, water quality and flow and native fish stocks have been decimated by the construction of weirs, causeways and floodgates. Over 10,000 barriers exist in NSW alone. Our rivers have indeed been 'cut up'. The consequences for fish have been dire, but it is interesting to note how thoughtful our early public servants were.

### Fewer snags meant fewer fish

As late as 1995, removing large woody debris – 'desnagging' – was seen as a good thing. However, as Brian Pratt, a long-time fisher of the Murrumbidgee River explains, this practice was at odds with healthy fish population: *...the channelization of Australian rivers, making them as straight as possible ..., was the quickest way to get rid of the water. They did that by removing obstacles, removing the snags. And removed significant habitat for the very sorts of fish we thought we might be protecting.*

(Bryan Pratt, excerpt from Frawley, J., Nichols, S., Goodall, H. and Baker, E. (2012) *Upper Murrumbidgee: Talking fish - making connections with the rivers of the Murray-Darling Basin*, Murray-Darling Basin Authority, Canberra)

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## ABOUT NEWSTREAMS

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*Newstreams* is an email newsletter to keep people up to date about fish habitat activities and important developments in fish ecology and habitat. It is free by email subscription. To **subscribe** use the [form](#). You can send in your habitat news by emailing the editor, Liz Baker ([newstreams@industry.nsw.gov.au](mailto:newstreams@industry.nsw.gov.au)). Back issues can be accessed from <http://www.fishhabitatnetwork.com.au/archive>.

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### FHN Partners

Amateur Fishing Association of the Northern Territory (AFANT) <http://afant.com.au>

Australian Fishing Trades Association <http://afta.net.au>

Australian National Sportfishing Association - NSW [www.ansansw.com.au](http://www.ansansw.com.au)

Capital Region Fishing Alliance <http://crfa.org.au>

Ecofishers [www.ecofishers.com](http://www.ecofishers.com)

Fisheries NSW [www.dpi.nsw.gov.au/fisheries/habitat](http://www.dpi.nsw.gov.au/fisheries/habitat)

Fisheries Victoria [www.dpi.vic.gov.au/fisheries](http://www.dpi.vic.gov.au/fisheries)

Freshwater Fishing & Stocking Association of Queensland (FFSAQ) [www.ffaqs.com.au](http://www.ffaqs.com.au)

NSW Council of Freshwater Anglers [www.freshwateranglers.com.au](http://www.freshwateranglers.com.au)

NSW Fishing Clubs Association [www.nswfca.com.au](http://www.nswfca.com.au)

PIRSA Fisheries and Aquaculture [www.pir.sa.gov.au/fisheries](http://www.pir.sa.gov.au/fisheries)

Recfish Australia <http://recfishaustralia.org.au>

RecfishSA [www.recfishsa.com.au](http://www.recfishsa.com.au)

RecfishWest [www.recfishwest.org.au](http://www.recfishwest.org.au)

Recreational Fishing Alliance of NSW [www.rfansw.com.au](http://www.rfansw.com.au)

SUNFISH [www.sunfishqld.com.au](http://www.sunfishqld.com.au)

Sweetwaterfishing <http://www.sweetwaterfishing.com.au>

Victorian Department of Environment and Primary Industries [www.depi.vic.gov.au](http://www.depi.vic.gov.au)

VRFish [www.vrfish.com.au](http://www.vrfish.com.au)

Western Australia Department of Fisheries: [www.fish.wa.gov.au/Pages/Home.aspx](http://www.fish.wa.gov.au/Pages/Home.aspx)

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