

Newstreams

News, research, on-ground works, innovation and events with a focus on improving fish habitat

This issue of Newstreams is proudly brought to you by Ozfish Unlimited as part of a project to build the capacity of recreational fishers in Australia to address fish habitat issues. The project is funded by the Fisheries Research and Development Corporation. Over the next couple of years the project will develop the framework for an action plan to guide fish habitat action in Australia. To find out more: www.ozfish.org.au



AUSTRALIAN NEWS

Happy 20th Hexham!

Hexham Swamp is celebrating the benefits of its 20-year rehabilitation project and fish and prawn nurseries are thriving once again. 20

years ago, the area was suffering the effects of the installation of floodgates in the early 1970s. The restriction of salt water led to the deterioration of estuarine habitat and water

quality and it became a freshwater swamp dominated by reeds and weeds. Fish and prawn populations declined dramatically. The reopening of the floodgates has restored 443 hectares of estuarine habitat so far, resulting in a substantial increase in the number of juvenile eastern king prawns and school prawns. Read more about this project:

<http://hunter.ils.nsw.gov.au/resource-hub/media-releases/2016/hexham-swamp-thriving-once-again.-thanks-to-20-year-rehabilitation-project>



An area of Hexham Swamp post rehabilitation. Photo: NSW DPI.

More habitat on the way for East Gippsland fish

Since 2003, instream fish habitat has been restored and enhanced in the Mitchell, Nicholson, Tambo and Snowy Rivers in Victoria's East Gippsland area. The habitats are created from tethering one or two logs to a pile driven into the riverbank. The piles and logs are installed from a barge on the river to minimise disturbance and damage to the riverbanks. Monitoring of the structures already installed has shown they are important fish transit points along the rivers and are being used by Black Bream, Luderick, and Mulloway. The structures provide refuge from predators and a host for food sources. Read more about this ongoing work: http://www.egcma.com.au/file/file/Media/east_gippsland_news_wednesday_november_23_2016_p6.pdf

Looking after spawning Murray Cod

Murray Cod spawn every year in the spring time, kick started by triggers such as increased daylight hours, water temperatures and water flows. This video summarises what Murray Cod need in terms of habitat and conditions to ensure more successful spawning and natural recruitment and how fishers can avoid doing things that could interfere with this success.

<https://www.youtube.com/watch?v=n5sqj4b4Ec&sns=fb>

Old oysters, new oysters, new habitat

Oyster shells destined for landfill are being used to create new habitat for both oysters and fish at five sites around Sydney harbour. The coconut fibre bags of shell create a perfect substrate for larval oysters. As the oysters colonise, they secrete a natural cement and bind it all together and the resultant structure will help minimise bank erosion. It is estimated that over 99 per cent of wild oyster populations in NSW are considered "functionally extinct". The new oyster beds provide erosion control, water quality improvement and habitat for invertebrates and fish. Read more: <http://www.abc.net.au/news/2016-10-27/oyster-bags-to-help-regenerate-sydney-harbour-marine-life/7969006>



Oyster shells in a bag – the beginnings of new habitat for oysters and fish.
Photo: Amanda Hoh.

And new oysters on old habitat

A Western Australian trial to return oysters to an Albany estuary is exceeding expectations. In December last year, six million oyster larvae were produced from brood stock collected from Oyster Harbour and, after a month in a commercial hatchery, the juvenile oysters were settled onto recycled oyster, scallop and abalone shells. The next step, in February this year, was to transfer the juveniles to mussel farm lines in Oyster Harbour, while artificial reefs were built. This was completed in May. Despite high mortality rates while on the mussel lines, an estimated couple of million juvenile oysters were relocated onto the artificial reefs. Monitoring has indicated that they have shown good growth rates over the past five months: the first steps towards the re-establishment of the oyster reef. Read more: <http://www.sciencewa.net.au/topics/fisheries-a-water/item/4349-promising-progress-for-pilot-shellfish-reef-restoration-program>.

Where Barramundi go in The Wet

More than 100 Barramundi have been tagged with acoustic transmitters in the Roper River, Northern Territory, to determine the water flows and levels that these fish need to breed and survive in the river system. Researchers are using a surgically implanted tag which enables the fishes' movements to be tracked using the 41 acoustic listening stations placed on the riverbed over a 300km stretch of the river. Some fish have been found to travel more than 100km over several days. Other adult female Barramundi are staying in freshwater habitat rather than move to the estuary waters for spawning. One metre-plus fish has moved more than 400km since March, swimming down to the mouth of the river, back to the Roper Bar and then back to the mouth, while a couple of fish swam more than 60km upstream within two days of being tagged. Other fish very similar in size caught from the same location have hardly moved at all, and are still sitting in the water hole where they were tagged more than a year later. Read more: <http://www.abc.net.au/news/2016-11-23/researchers-track-barramundi-top-end/8046432>.



By using surgically implanted trackers, the researchers have also identified that barramundi do not necessarily change gender as they age. They found 11-year-old females in the freshwater that are not spawning or changing to male at all during their life history. Photo: Charles Darwin University.

Carp trapped by their own behaviour

Common Carp move from rivers into wetlands to spawn, making them vulnerable to trapping. Researchers have trialled a trap designed to separate carp from native fish entering wetlands by exploiting their different jumping and pushing behaviours. They found that while some Carp avoided the trap, most were trapped and most of those were successfully isolated by jumping or pushing. The trap was most efficient when the Carp were ready to spawn. Read more of this study by Conallin and others in *Fisheries Management and Ecology*: <http://dx.doi.org/10.1111/fme.12184>.



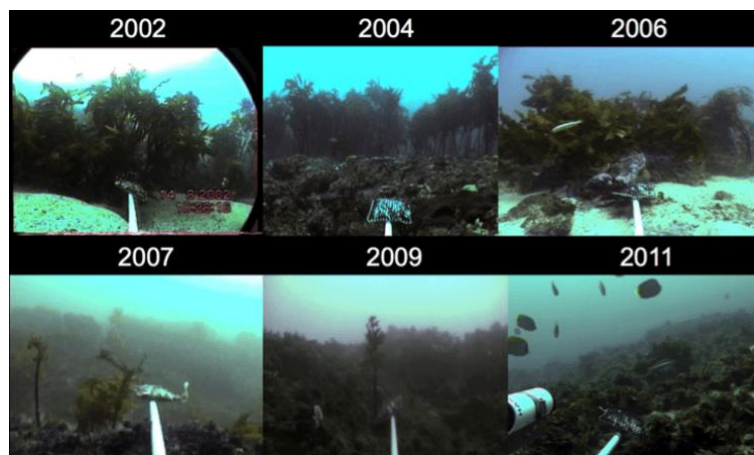
A carp trapping cage uses natural behaviour to trap the carp. Photo: Finterest.

Pike River floodplain open to fish

For the first time since the 1930s, fish are able to access habitat in South Australia's Pike River floodplain. A new regulator allows unimpeded fish passage between Mundic Creek and the River Murray (more details available [here](#)). This addition is one of several projects that are restoring fish habitat to this area. Read more about the Pike Floodplain project here: <http://www.naturalresources.sa.gov.au/samurraydarwinbasin/projects/all-projects-map/caring-for-the-pike-floodplain>.

Kelp needs help

Kelp forests are suffering from the dual impact of an influx of warm-water fish species and higher water temperatures. Kelp forests provide vital habitat for many fish species, as well as lobster and abalone. Over 10 years, lush kelp forests have completely disappeared in some NSW offshore sites, including one at the Solitary Islands Marine Park. Researchers used underwater video footage of this site to access the change. As well as watching the gradual decline of the kelp, they were able to identify fish as central culprits behind this disappearance. The effects of warming in kelp forests are two-fold: higher temperatures not only have a direct impact, they also have an indirect impact by increasing the appetite of fish consumers, which can devour the kelp to leaving no cover on the ocean floor. Between 2002 and 2012, there was an increase in both the number of fish bite marks on kelp and the abundance of warm-water seaweed-eating species. Read a summary: <http://www.australiangeographic.com.au/topics/science-environment/2016/11/kelp-forests-declining-around-the-world>, or the research by Verges and others in *PNAS*: <http://dx.doi.org/10.1073/pnas.1610725113>. Similar research is looking at what is happening to temperate seagrass and kelp: the work by Hyndes and others published in *Bioscience*: <http://dx.doi.org/10.1093/biosci/biw111> [Open access].



Underwater footage showing the loss of a kelp forest off the NSW coast. Photo: Hamish Malcolm.

INTERNATIONAL NEWS

Daylight the stream and catch Trout

A section of Porter Brook was buried in the low brick tunnel in the early 1850s, then 'daylighted' as part of an urban renewal project. It is not known what the water quality was like when the waterway was buried or if there were fish there, but an enthusiastic angler flicked a line in the newly opened reach and was rewarded with what could be the first Trout in 160 years. The project is the 2016 Winner in the Canal & Rivers Trust for "Contribution to the Built Environment" and the re-connection of a little urban stream to the surrounding community and the creation of new habitat for fish and other aquatic wildlife is a great result for the natural environment. Read more: <http://www.wildtrout.org/blog/previoursly-buried-section-stream-produces-first-fly-caught-trout-160-years>. To water videos about the de-culverting project: <https://www.youtube.com/watch?v=oexE1N4WwU&feature=youtu.be>.



A small but significant Trout.
Photo: Simon Ogden.

Not just for adults!

Juvenile fish, as well as adults, need to be able to use fishways to move upstream. A study in the north-west of England looked at how juvenile Trout were able to use several different types of structures that enable fish passage. The best for the Parr was an open culvert, followed by a 'Servais low-cost baffle' type fishway. The worst was the embedded rock ramp. The time it took varied also, with only a 'pool weir' fish passage structure enabling the fish to pass upstream as quickly as the open culvert. The capacity to use the structures appeared to be linked with body-length but body-length did not influence which structures were better. Read more on the study by Forty and others in *Ecological Engineering*: <http://dx.doi.org/10.1016/j.ecoleng.2016.05.048>.

Getting dirty for the Dever

The River Dever, Hampshire, UK, and its fish have been suffering: low flow due to impoundments, siltation of spawning gravels, uniform habitat and steep banks. The lack of habitat was known to be limiting recruitment and supporting high levels of predation of juvenile Trout and Grayling. In two weeks there has been a transformation. The canopy has been opened up to let more light in and the wood re-used to create flow-deflecting woody habitat features. Together with some bank-side structures these are expected to provide juvenile refuge habitat and help narrow the channel, increase flow, scour gravels and create a more sinuous, meandering channel. Pools have been dug out and gravels introduced to make the new pools more hospitable for fish and provide spawning opportunities at the tail of each pool. The transformation from degraded to vibrant habitat gave those involved a huge sense of satisfaction and pride. And the fish loved it too. Minutes after digging a new pool, the fish had already moved in and in one small pool over twenty Trout and Grayling were counted. Read more: <http://www.thetimesherald.com/story/news/local/2016/11/11/st-clair-river-restoration-projects-paying-off/93535210/>



Creating woody mattresses, using material from the opening up of the canopy, was part of the rehabilitation of fish habitat on the River Dever. Photo: Wild Trout Trust.

Rock ramp better but not enough

Researchers looked at the impact of rock ramp fishway, comparing what fish were in the Shiawassee River, Michigan, USA, with those in nearby rivers, one without a fishway and one which was free-flowing. The abundance of fish in the river with the rock ramp fishway was more similar to the free-flowing river, however the number of fish species in reaches was more similar to the dammed river. It appears the rock ramp has improved connectivity, but has not fully restored conditions to the level observed in a free-flowing river. Read more of this work by Stoller and others in *Fisheries Management and Ecology*: <http://dx.doi.org/10.1111/fme.12183>.

New culvert gives access to 30 miles of habitat

Replacing a 6 foot culvert with one arc-shaped, four times the size and with a natural stream base has opened up 10 miles of upstream habitat and given fish access to 30 miles of interconnected high quality habitat. The original culvert on Falls Brook, New Hampshire, USA, was about 40 years old and a significant barrier to fish passage. The new culvert work is supplemented with new plantings on the banks. Read more: http://www.sentinel-source.com/news/local/swanzey-brook-restoration-project-aids-fish-habitat-helps-to-mitigate/article_582d3033-8f73-5557-b9e0-1d80c55eb223.html.

Riparian veg keeps fish fed

Riparian vegetation has been found to influence the amount of macroinvertebrate prey for salmonids. It had been assumed that there is more benthic prey, like shrimp, available within streams without riparian vegetation and this has been part of an argument against using increased riparian cover for shading purposes. However, researchers have found that it depends on the size of the waterway and in larger streams the presence of riparian vegetation increased benthic macroinvertebrate density. In addition, streams with riparian vegetation had more drifting prey of aquatic origin. In Spring, these streams also had greater densities of prey of terrestrial origin. Read more of this research by Ryan and Kelly-Quin in *Fisheries Management and Ecology*: <http://dx.doi.org/10.1111/fme.12193>.

Reconnecting the river brings the fish back

A year ago Jackknife Creek, Idaho, USA, was cut-off from other waterways, with high banks scoured by Spring run-off funnelled by a road crossing. Now, there are fish. The road had been largely washed away so it was decommissioned, enabling the creek banks to be re-built, re-shaped and replanted. The riverbed was raised up four feet and logjams and willow clumps installed to a softer edge that is even with the ground rather than dropped down. The old car bridge was dismantled and the timber used to create a footbridge. The final step was the re-connection to the river. One year later, one of the reconstruction team returned with a fishing rod – and caught an eight-inch Yellowstone Cutthroat Trout. Read more: <http://www.hatchmag.com/articles/restoring-hope/7713810>



There are fish in the restored Jackknife Creek.
Photo: Kris Millgate.

Mangroves for the next generation of fish and fishers

Fishing communities in the Iloilo region, Philippines, are creating artificial reefs and planting mangroves to ensure their children can also have fish to catch. About 100 jackstone-type artificial reefs were installed around a year ago in the local marine protected areas. After 3 months, local fishers that many fish already spawned there and reported a big spike in the fish supply. The jackstones also prevent illegal fishermen from trolling because their nets get caught in the jackstones. The fishers are also looking after the juvenile fish. Mangrove shoots line more than 7 hectares of shoreline. The locals volunteer twice a month to maintain the area, keeping the seedlings clear of trash. Read more: <http://www.rappler.com/move-ph/issues/disasters/145137-iloilo-fishermen-lead-coastal-management>.



"We're doing this for the next generation. We do this so that our children and our grandchildren will have enough fish supply. These mangroves will grow and help them". Photo: David Lozada Rappler.

Habitat beyond their wildest dreams (and under budget)

Thirty years ago, in 1986, contractors working on the Louisiana Crevasse Project, Louisiana, USA, cut three crevasses in natural levees on Pass a Loutre Wildlife Management Area. The state had budgeted \$300,000 for the project, but the contractors spent only \$88,000 of that allotment. The crevasses were expected to produce land for 10 to 20 years by allowing sediment-laden water to flow into interior marshes and ponds. Over time, the sediment builds up and begins to return open water areas to healthy freshwater wetlands. The crevasses are still delivering - to date, the cuts have built 760 acres of marsh at a cost of only \$115 per acre. The once open water bays and ponds now host a mosaic of habitats, including tidal mudflats, emergent fresh marsh and woody vegetation, and are providing estuary habitat for both marine and freshwater fish. This natural process of land creation comes at virtually no cost once the cut has been made and allows for a natural gradient of marsh to form. Having a marsh slowly and naturally recreate itself with varying elevations allows for more diversity in the species that use the habitat. Read more: http://www.nola.com/outdoors/index.ssf/2016/11/cutting_holes_in_levees_has_cr.html.

Sand wanding used to restore habitat

Habitat degradation and loss of access to habitat are two critical factors that have led to the decline in Brook Trout and Atlantic Salmon populations in Nova Scotia, Canada. One of the techniques being used restore habitat is 'sand wanding': a process somewhat like vacuuming excess sediment from the surface and subsurface of gravel and cobble beds that would otherwise provide high quality spawning habitat. Increasing rates of sedimentation, caused by activities such as deforestation and de-vegetation, can result in the accumulation of fine sediment in river bottoms. Excess deposits of fine sediments can smother eggs, as well as other organisms that fish utilize as a food source. Sand wanding was used to clean 2.38 square kilometres of river in areas assessed as providing otherwise high quality spawning habitat. In addition to sand wanding, upstream access has been restored by building and installing 10 rock weirs, four low-flow barriers, nine pairs of baffles and two fish chutes. Read more: <http://thechronicleherald.ca/valleyharvester/1413923-focus-on-fish-habitat-and-declining-fish-populations>.

Awarded for fish habitat conservation

Bonnie Bick and Jim Long have been awarded the 2016 Melissa Laser Habitat Conservation Award for their 20 years of unpaid efforts to protect one of the most important fish breeding grounds in the Chesapeake Bay watershed, Maine, USA. Their accomplishments include protecting more than 1,000 acres along Mattawoman Creek, stopping the proposed Cross County Connector Extension across the watershed's headwaters in Charles County, promoting a 10% impervious surface cap within the watershed and serving as enthusiastic citizen scientists collecting the critical fish spawning and habitat data necessary to support their efforts. The Award is bestowed upon individuals deemed to further the conservation, protection, restoration, and enhancement of habitat for native Atlantic coastal, estuarine-dependent, and diadromous fishes in a unique or extraordinary manner. Read more: <http://www.atlanticfishhabitat.org/bonnie-bick-and-jim-long-receive-the-2016-melissa-laser-fish-habitat-conservation-award/>

RESOURCES

Improvements for native fish in the Murray-Darling Basin

Read about the work being done to improve river health and the benefits environmental watering is bringing for native fish in the Murray-Darling Basin in the latest edition of *RipRap* magazine, free to download: <https://arrc.com.au/product/riprap-39-habitat-makes-fish-happen-pdf-copy/>

River Restoration and Biodiversity; Nature Based Solutions for Restoring the Rivers of the UK and Republic of Ireland

This IUCN report provides recommendations for policy makers and practitioners to promote and improve river restoration. [More](#)

Mangrove restoration: to plant or not to plant?

The majority of mangrove planting efforts are failing. A more effective approach is to create the right conditions for mangroves to grow back naturally. Mangroves restored in this way generally survive and function better. This leaflet aims to contribute to best practice by discussing the issues around planting or not planting. [More](#).

Through A Fish's Eye: the status of fish habitats in the United States 2015

This report summarizes the results of a nationwide assessment of human effects on fish habitat in the rivers and estuaries of the United States. It is based on fish data from more than 39,000 stream reaches nationally. [More](#)

Bringing back the Pearl Mussel

Short film reviewing 3.5 years of works to restore the habitat that will support the Freshwater Pearl Mussel. <http://westcumbriarivertrust.org/projects/pearls-in-peril/media/04b-pip-movie>

Exploring US culvert improvements

An interactive map-based site providing information about over 1000 projects to open up waterways in the USA: <http://www.fs.fed.us/biology/fish/1000-culverts/>

ABOUT NEWSTREAMS

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.

Back issues can be accessed from <http://www.fishhabitatnetwork.com.au/archive>.

Newstreams is supported by funds from the NSW Recreational Fishing Trust, raised from the NSW Recreational Fishing Fee.

Newstreams is published electronically every three months by the Aquatic Habitat Rehabilitation Unit within Fisheries NSW on behalf of the Fish Habitat Network, a partnership of organisations working on fish habitat and a network of fishers engaged in fish habitat issues.



Department of
Primary Industries



Website www.fishhabitatnetwork.com.au

Facebook
www.facebook.com/fishhabitatnetwork

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

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

Ecofishers www.ecofishers.com

Fisheries NSW www.dpi.nsw.gov.au/fisheries/habitat

Fisheries Victoria www.dpi.vic.gov.au/fisheries

Freshwater Fishing & Stocking Association of Queensland (FFSAQ) www.ffsaq.com.au

NSW Council of Freshwater Anglers
www.freshwateranglers.com.au

NSW Fishing Clubs Association www.nswfca.com.au

PIRSA Fisheries and Aquaculture
www.pir.sa.gov.au/fisheries

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

RecfishSA www.recfishsa.com.au

RecfishWest www.recfishwest.org.au

Recreational Fishing Alliance of NSW
www.rfansw.com.au

SUNFISH www.sunfishqld.com.au

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

Victorian Department of Environment and Primary Industries www.depi.vic.gov.au

VRFish www.vrfish.com.au

Western Australia Department of Fisheries:
www.fish.wa.gov.au/Pages/Home.aspx