

Newstreams

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

This issue of Newstreams is brought to you in partnership by the [Fish Habitat Network](#), with funds from the [NSW Recreational Fishing Trust](#).

AUSTRALIAN NEWS

An unregulated Ovens River is fish-full of wonder

Victoria's Ovens River is one of two significant rivers in the Murray-Darling Basin that remains unregulated and the only major floodplain in the southern Basin with a natural flooding and drying regime. As a result, the Lower Ovens effectively takes care of itself. It contributes clean, filtered water to the Murray River and its extensive network of wetlands offer a safe nursery for many native fish species. High flows that come down the Ovens River, usually in winter and spring, spill out onto floodplain, filling a network of some 1,800 wetlands and providing essential nursery habitat for fish, including Murray Cod, Golden Perch and Silver Perch. 96% of these wetlands are inundated on average every three years. Read more: <https://www.necma.vic.gov.au/lower-ovens-floodplain>.



A natural water flow regime means that wetlands such as this one in the lower Ovens River floodplain provide vital fish nursery habitat. Photo: North-east Catchment Management Authority.

Secrets of the Saltmarsh revealed

The role coastal Saltmarsh habitats play in supporting local fish communities is often misunderstood. These habitats filter fresh and salt water, provide natural barriers to waves and erosion, and are important as breeding and nursery grounds for marine species such as juvenile King Prawns. Crabs use Saltmarsh for breeding and when the tide comes in numerous fish come in to feed on the baby crabs. A study in the saltmarsh habitats of South Australia's Eyre Peninsula found that by the time the tide turns the majority of the fish that entered the saltmarsh to feed have doubled their body weight. Read more (includes a link to video and a field guide to 'Samphires of Eyre Peninsula'): <https://www.naturalresources.sa.gov.au/eyrepeninsula/news/180909-seaweek-film-launch-saltmarsh>.



Bearded Glasswort meadows is the preferred habitat of the small mud crab, and the larvae of these crabs is a major food source for juvenile fish. Photo: Natural Resources Eyre Peninsula.

Restoring Saltmarsh and reconnecting waterways are also the business of the Hindmarsh Island Landcare Group, whose major project has been the Murray Mouth Estuary Restoration Project. Since 2001, 500,000 plants have been planted on over 100 sites. Read more: https://nationallandcareconference.org.au/wp-content/uploads/2018/07/SA_Coastcare-Award-Hindmarsh.pdf.

Getting the Carp out

The Williams' carp separation cage exploits a typical behaviour of Carp: they jump out of the water when they are trapped in a fishway. Native fish typically do not jump in this way. The Carp 'jump' into a confinement area, from which they can later be removed. A Williams' cage was tested in a fishway at Lock 1 on the lower reaches of the Murray River during spring and summer from November 2007 to March 2018. The result of the cage's operation was the capture of approximately 723 tonnes of adult Common Carp, or about 289,000 fish. The maximum rate of catch was 5 tonnes per day and highest in Spring, when fish were migrating to spawn. The bycatch of non-target native fish was practically zero. Read more: <http://www.fishingworld.com.au/news/carp-control-innovation-removes-289-000-fish> or the publication by Stuart and Conallin in the *North American Journal of Fisheries Science*: <https://doi.org/10.1002/nafm.10221>.

Using other methods, more than 300kg of Carp and Redfin were removed from 13.5km of Hughes and Seven creeks, in Victoria's Goulburn Broken Catchment area, to protect populations of threatened native fish including Trout Cod and Macquarie Perch. Redfin are a serious threat to the survival of these species as they prey on young fish and compete for food. In both creeks, a large proportion of the Redfin were less than one year old. Surveys of habitat improvement works had found that Redfin numbers in Hughes Creek were the highest since fish surveys commenced in 2006. This is thought to be due to localised natural flooding in December 2017 that was not good for native fish spawning but suited Carp and Redfin. Read more: https://www.gbcma.vic.gov.au/news_events/redfin-and-carp-removed-from-hughes-and-seven-creeks.html.

The Murray Hardyhead returns to Western NSW

The Murray Hardyhead is a small fish that has been considered extinct in NSW for more than a decade. It currently survives in a few places in Victoria and South Australia. Recently, a small population of these fish from South Australia's Riverland has been relocated to the Little Frenchman's Creek wetland on Wingillie Station in far western NSW. This is the first time an attempt has been made to re-establish Murray Hardyhead and follows years of hard work by local landholders, community groups and agencies to create suitable conditions. The relocation site contains ideal habitat for Murray Hardyhead because it is already saline, which they prefer, contains plenty of submerged structure in which they hide and breed, and natural food sources. The capacity to easily deliver more environmental water if needed is also a benefit. Read more: <http://www.environment.gov.au/water/cewo/media-release/endangered-fish-returns-western-nsw>.



It may not look like ideal fish habitat but it is for the Murray Hardyhead and this is 'Welcome home!' in far-western NSW. Photo: NSW DPI.

Once were trees

A number of large red gums removed during roadworks for the Murray Valley Highway are being recycled as much-needed habitat for native fish in the Goulburn River, Victoria. The logs enabled double the planned number of snags to be placed in the river as part of a re-snagging project. Almost 280 logs were placed in a stretch of the river, bringing the total number of snags placed in the Goulburn River below Shepparton to 800. Monitoring shows that re-snagging, as well as other activities such as water for the environment, has improved native fish numbers in the Goulburn River. Read more: https://www.gbcma.vic.gov.au/news_events/red-gums-removed-during-road-project-re-used-for-fish-habitat.html.

Coral Trout have had a gut-full of plastic

Microplastics and other man-made fibres have been found in the guts of juvenile Coral Trout from the Great Barrier Reef. Of the 20 fish studied, 19 were affected. 94 per cent of the 115 items of man-made debris found were a mix of semi-synthetic and naturally-derived materials, while only 6 per cent was synthetic. Items such as rayon, which is a semi-synthetic, were much more common in the fish guts than plastic items such as polyester. Read more: https://www.aims.gov.au/docs/media/latest-releases/-/asset_publisher/8Kfw/content/reef-fish-show-signs-of-marine-debris-in-their-gut or the published research by Kroon and others in *Scientific Reports*: <https://www.nature.com/articles/s41598-018-34590-6> [Open access].



Almost all of the Coral Trout studied were found with plastic in their guts. Photo: Australian Institute of Marine Science.

Clean4Shore is the People's Choice

Clean4Shore has won the People's Choice Award in the National Landcare Awards 2018. They run about 70 field trips a year, involving the community, school and business groups in the removal of plastic and polystyrene around the Hawkesbury River, Brisbane Waters and Tuggerah Lakes, NSW. In one year, 554 volunteers removed 182,800 items of litter, including 33,360 plastic bottles, 26,818 bits of plastic bag and 26,393 pieces of polystyrene. These items are often found deep in the mangroves, unseen from the foreshore. One field trip saw the removal of ten thousand plastic bottles and polystyrene from a small area close to the Gosford central business area. Read more: <https://nationallandcareconference.org.au/project/clean4shore-nsw/>.

Shellfish recycling

The Moreton Bay Shellfish Recycling Centre is now officially open. Built on donated land, the centre accepts oysters from local restaurants and seafood suppliers, which are then cleaned and sterilised for four months to prevent the introduction of pests and diseases before they are reintroduced into the estuary as restored reef substrate. The recycling of shells is seen as a practical and productive way to rebuild shellfish reefs and restore hectares of fish habitat. The use of recycled shells to re-establish oyster reefs in coastal water was trialled in Pumicestone Passage. Almost 12 months on, underwater footage shows once barren and silted mudflats now teeming with fish and baby oysters have started growing on the recycled shells. Read more: <http://www.fishingworld.com.au/news/old-oyster-shells-are-reviving-a-moreton-bay-reef>.



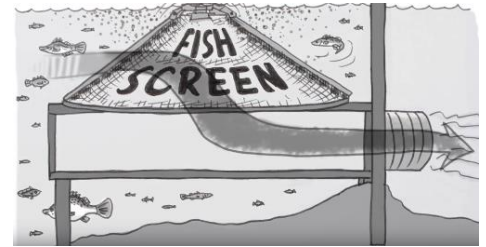
This small mound of restaurant waste will be part of a restored shellfish reef one day soon. Photo: Ozfish Unlimited.

Cod in the Campaspe

Local fishers of Victoria's Campaspe River are reportedly enjoying the benefits of a healthier river. Improved water quality, especially in the areas that have been fenced off, has meant that fishing is better. Fishers are seeing a big difference in the Murray Cod and Yellowbelly (Golden Perch) they are catching and releasing: the fish are bigger, fatter and have more vibrant colours than they have had previously. Murray Cod spawning was recorded for the first time in the Campaspe River last year, on the back of the annual winter and spring flows. Read more: <http://www.nccma.vic.gov.au/media-events/media-releases/catching-cod-fever>.

Keeping fish out of irrigation ditches

Fish screening devices on irrigation pumps are gaining recognition as ways to help reduce the loss of fish into irrigation systems. It is now recognised that in addition to the loss of adult fish, thousands of juvenile fish are diverted into these systems during high flows and effectively lost to the population. A video explaining the issues and how these diversion devices work is available [here](#).



The video details how fish screening devices work as part of a working irrigation system.
Photo: Victorian Environmental Water Holder.

An underwater eye on Port Philip reef restoration

In 1802, British explorer Matthew Flinders was astounded by the expansive oyster clusters in Port Phillip Bay, Victoria. Up to half of the bay was once dominated by shellfish reefs, but they are now functionally extinct. Restoration efforts are now underway. Restaurant waste and limestone rubble were used to re-build the reef at Margaret's Reef off St Kilda, a once a popular fishing spot that had been reduced to a patch of sand. It was then seeded using hatchery grown oysters and mussels. Recreational fishers using baited remote underwater video units to monitor the fish species using the fledgling reef have spotted Crabs, Octopus and small fish, including hundreds of juvenile Snapper. Read more: <http://www.fishingworld.com.au/news/vic-anglers-go-fishing-for-habitat-in-the-bay>.



Margaret's Reef at Stage 2 of its restoration. Fishers are reporting hundreds of baby Snapper at some of the restoration sites in Port Phillip Bay. Photo: Ozfish Unlimited.

Artificial reef providing habitat

In 2016, as part of the Port Coogee Maritime Trail, Western Australia, thirty-four purpose-built reef substrates were installed along 250m of the marina breakwater. Prior to installation, the site was predominantly sand with limited seagrass cover. Surveys of the artificial reef have found that it now provides over 100 m³ of complex habitat. Fourteen habitat types and 53 fish species were observed, including Crested and Dusky Morwongs, Western King Wrasse, Mullet, Whiting, Western Striped Grunter, Trevally, Tarwine, Pink Snapper, juvenile Baldchin Grouper, Seapike and Snook. Many of these species were not recorded, or were recorded in low numbers, at the site before the reef was installed. Read more:

https://www.researchgate.net/publication/325591487_Community_summary_Changes_in_the_habitat_fish_and_invertebrate_communities_following_the_installation_of_the_Port_Coogee_Artificial_Reef.



One of the structures that make up the artificial reef at Port Coogee. Photo: Subcon.

Temperature and the Carp Herpes Virus

Research has identified that the timing of any release of the Carp Herpes Virus is critically important. The virus has a specific temperature range of between about 16-28 degrees Celsius when it can replicate in Carp and cause disease. If it is cooler or warmer than that, a carp can become infected but not die and instead become immune and a carrier of the virus. Read more: https://www.abc.net.au/news/2018-10-12/carp-herpes-virus-plans-put-on-hold/10370836?WT.ac=localnews_brisbane.

Environmental water in dry times

This year's delivery of water for the environment in the northern Murray-Darling Basin targeted helping waterways survive the dry times and maintaining the resilience of plants and animals, including fish. The July start of the delivery of water for the environment to central NSW's Macquarie River aimed to benefit native fish such as Murray Cod and Freshwater Catfish and provide low flow connectivity to the Barwon River. Water began flowing through the Macquarie Marshes and into the northern Marshes at the start of August, helping to pre-wet the system, filling channels and increasing soil moisture. The September delivery increased the area of the Marshes that received water, and provided more food and movement opportunities for native fish. The event is now a low stable flow that will continue to spread inundation in the Marshes while keeping Murray cod nesting sites inundated along the mid-Macquarie River.

More: <http://www.environment.gov.au/system/files/resources/2fce2875-56f3-4fb0-a504-190a7c9bd624/files/macquarie-river-marshes-watering-event-update2-041018.pdf>.

The inflows into the Namoi River, central western NSW, have been near record lows. For over half of 2018, the flow downstream of Gunidgera Weir (near Wee Waa) has been less than 1ML/day and the Namoi River last flowed here in August. Fish have spent most of the year in stagnant waterholes. Native fish in the Namoi downstream of Wee Waa are a key environmental asset, and include silver perch, Murray cod and, potentially, Freshwater catfish. Tens of kilometres of habitat in the Namoi River has been replenished by a water for the environment flow downstream of Gunidgera Weir. As a result, the chance of fish survival will increase significantly, particularly between Wee Waa and Bugilbone. Read more: <http://www.environment.gov.au/system/files/resources/bd57c196-97dc-448e-8f07-f9a2d6e4fe97/files/namoi-river-watering-event-update-2-16-nov-2018.pdf>.



The Namoi River downstream of Gunidgera Weir in September (left) prior to the water for the environment delivery, and in November (right) with a flow of around 300 ML/day. Photo: Commonwealth Environmental Water Office.

More Hunter River habitat

Recreational fishers were among the community planting native trees and shrubs as part of the Hunter River habitat rehabilitation project at Millers Forest, central coast NSW. This day's planting included 350 native trees and shrubs on the river bank, which will lead to reduced erosion, improved water quality and more shade. Cattle are also being prevented from accessing the river bank. More [here](#).



Planting for future fish habitat along the Hunter River. Photo: Hunter Native Fish.

INTERNATIONAL NEWS

Spawning up a storm

As extreme weather patterns threaten to bring more and larger storms to the US Gulf Coast, research has shown some important fish species are able to continue spawning even in a severe storm. Spotted Seatrout kept spawning in late August 2017, even as the eye of Hurricane Harvey passed overhead, bringing with it windspeeds of up to 134 miles per hour and a storm surge of 8-10 feet. The only effect of the hurricane was that immediately after the storm, the fish began spawning 2.5 hours earlier than they had been. This appears to relate to water temperature changes. The murky waters of the Gulf of Mexico can make tracking the Seatrout difficult, so the scientists place underwater microphones in known spawning locations to record the fishes' activities. Read more: https://www.eurekalert.org/pub_releases/2018-11/uota-ugf110518.php.

Growing fish in the winter and beef in the summer

The completion of the Winter Lake restoration project, in Oregon's Coquille River Valley, USA, helps local cattle farmers and provides almost 8 miles of tidal channels and 1,700 acres of habitat for Coho Salmon and other fish species. This lowland country has rich pasture for cattle, and, in the past, levees were built, channels straightened, and acres of wetlands were filled to create agricultural land. Like many north-western rivers, the Coquille had lost much of its estuary habitat and nearly 95 percent of prime Salmon spawning and rearing waters there are gone. The failure of tidal gates provided an opportunity to re-think how water was managed. The new state-of-the-art tide gates improve water control and protect the land from flooding during prime grazing season in the warmer months and rebuild high-quality habitat for juvenile Coho Salmon in the winter. Read more: <https://www.fisheries.noaa.gov/feature-story/construction-completed-oregon-working-landscape-project-benefiting-farmers-fish>.

The beauty in chalk-stream restoration

In 2014, the Eastridge Estate on the River Kennet in Berkshire, England, won a Wild Trout Trust Conservation Award for a large-scale project that improved in-river habitat, fish passage and wetland meadows. Trout, from juveniles to 3 to 4 pound in size, as well as grayling, now flourish in the river. A video highlights the ongoing work and ethos of the Estate, with reflections from the young Riverkeeper who continues the improvements to the river habitat.

Watch the video here: <https://www.wildtrout.org/news/eastridge-fishery-river-kennet-video>.



A Grayling from the rehabilitated River Kennet. Photo: extracted from video produced by Chalkstream Fly.

Citizens sue State for Salmon

The latest tangle in a nine-year case about the rights of the Chitna Citizens Coalition to reserve water in a stream to protect wild Salmon involves an appeal in Alaska's Superior Court challenging a decision to deny their previously won legal right to do so. The case involves mining, historical water rights and cultural values. Read more: <https://alaska-native-news.com/alaskans-sue-state-to-protect-wild-salmon/37687/>.

Three tales of fish returning

Fish like Alewife and Blueback Herring, American Shad, and American eel split their time between freshwater and saltwater habitats. However, dams and other barriers have prevented these fish from accessing spawning and nursery grounds, and in some North American waterways have done so for centuries. In the Northeast USA, several projects have removed dams and improved passage, re-opening more than 100 miles of river to migratory fish. Some of the results of these projects include:

- An underwater camera saw the first Herring to enter the Lake Sabbatia, near Taunton, Massachusetts in 200 years. It was using a new fish ladder and by the end of spawning season, at least 1,200 Herring had swam through.
- In Connecticut/Rhode Island, Bradford Dam was replaced with a nature-like fishway, opening nearly all of the river's 34 miles to migratory fish. A dam on a tributary of the Mystic River had been a barrier for fish for some 350 years before its removal in 2015. This year, more than 1,200 Alewives were found upstream of the former dam.
- In Fall 2017, young-of-the-year Alewife on their way to the Atlantic were netted near a new culvert at Wreck Pond, a clear sign that adults were making it to the spawning grounds upstream. This year, more than 150 were found, a 30-fold increase over any other year.

Read more: <https://medium.com/usfishandwildlifeservicenortheast/nature-returns-when-dams-come-down-fish-come-back-df2184215445>.

'Full body surgery' revives a Crucian paradise

Pinnock Lake, in Dorset, England, is now a reed edged pool with clear, rich looking water about an acre in size and perfect Crucian habitat. It had been anything but this until the graft and perseverance of members of the Wimborne and District Angling Club – and the use of heavy machinery – restored it. Crucian are no longer common and one of the main causes of this has been the decline of their favourite places: small lakes and ponds. These do not look after themselves, becoming, like Pinnock Lake, becoming badly silted and overgrown when neglected. Read more: <https://linesonthewater.anglingtrust.net/2018/09/28/chris-yates-crucian-carp-and-the-revival-of-a-lost-fishing-lake/>.



A libation to the future fishing of Pinnock Lake for the Crucian that can now call it home. Photo: Angling Trust.

Eel pass in place

Fish and Eels can now navigate safely over the weir structure on the River Colne, England. The weir is a particularly unusual shape and the fish pass was specifically designed to fit this shape and involved fixing low cost baffles and eel tiles to the weir. The complicated fish pass meant contractors had to dry a section of the river out for the work to be completed. Two eels were found downstream of the structure while the drying out occurred, showing that Eels can get as far as Earls Colne so the new structure should enable them to move further up the catchment. Read more: <https://www.gov.uk/government/news/helping-fish-and-eels-along-their-journey>.

Would-be re-snaggers go back to school

The first-ever Large Wood Technical Field School provided scientific and hands-on instruction in both engineered and non-engineered large wood augmentation techniques – or ‘re-snagging’. Designed for forestry and restoration professionals, the two-day course sold out months in advance. It was held in Caspar, California, USA, where the installation of large wood structure in coastal streams north of San Francisco has proven a highly effective technique for restoring and improving habitat for Coho Salmon. In 2017 the North Coast Coho Project installed around 725 pieces of large woody material in over 11.5 miles of North Coast streams and removed or restructured 3 major fish migration barriers. Read more (includes access to presentations): <https://www.tu.org/press-releases/first-ever-large-wood-field-school-will-help-coho-recovery-efforts>.



Participants at the field school learned how to design and implement large wood restoration projects. Photo: Trout Unlimited.

Fixing the river in the middle of Denver

The rehabilitation of the South Platte River, which runs through Denver, Colorado, USA, is seen as a work in progress. Now people fish the river, however in its past it was little more than an open sewer. A disastrous flood in 1965 led to flood mitigation that further abused the river. Since 1974, however, efforts have been underway to restore the river for itself, its fish and the community. Progress is being made despite the fact that the river will always be susceptible to the inherent hazards of urbanization. Water quality, in particular, remain a significant issue. The return of Trout is seen as a sign that the overall health of the river is improving. Read more : <https://coloradosun.com/2018/10/01/denver-embrace-south-platte-river/>.



It was once an open sewer but Denver's South Platte River is now providing fishers with the lure of Trout. Photo: Kevin Simpson, The Colorado Sun.

Shallow habitat rehabilitation benefits fish

The shallow water riparian zones important as fish nursery areas had been largely lost in the St. Clair River, which separates Canada and the USA. Remediation projects along the river's United States bank replaced seawalls with sloping banks and added in-stream structure such as root wads and boulders. Monitoring the effectiveness of the work proved to be tricky as there is no standard sampling protocol for shallow habitat in large rivers, especially when both adults and juvenile fishes should be targeted. Researchers used a multi-gear sampling strategy targeting multiple fish species and life history stages at both the remediation and control sites. The results varied with the techniques used, however electrofishing captured more species and more individuals and was therefore valuable in assessing the impact of rehabilitation of large river shorelines. Results indicated that juvenile and adult fish were more abundant at remediation sites than at control sites. Read more of this research by Fischer and others in *Ecological Engineering*: <https://doi.org/10.1016/j.ecoleng.2018.07.022>.

Difficult site? Fly the wood in!

Yakama Nation tribal members shared a ceremonial song celebrating the Salmon as a helicopter lowered logs into the Little Naches River, Washington State, USA. More than 6,000 logs were carefully placed into 24 miles river. Floodwaters will bury the new logs under gravel and become a permanent feature, creating habitat for fish and slowing the flow of water. Chinook Salmon, Steelhead and Rainbow Trout are among the fish likely to benefit from the side channels and places to store cool groundwater, creating the colder habitats those fish prefer as river temperatures rise. Read more:

https://www.yakimaherald.com/news/local/wood-fiesta-logs-will-be-building-blocks-for-stream-restoration/article_409c0e4c-e89b-11e8-948b-7f4037bae000.html

or watch here: <https://www.youtube.com/watch?v=LLTwDNjULI4>.



Helicopters were the most cost-effective option for moving the logs and avoided the significant damage to roads likely if trucks had been used. Photo: Amanda Ray, Yakima Herald-Republic.

RESOURCES

Proceedings of the 9th Australian Stream Management Conference

Fish habitat and fish responses to habitat rehabilitation are among the papers included in the Proceedings. For example:

- Zeb Tonkin: *Monitoring fish responses to environmental flows across Victoria: a shift towards understanding processes, population dynamics and long-term projections.* (page 25)
- Barnaby Resch: *Returning native fish to an urban creek in Logan* (page 366)
- Matt Curtis: *Fish Passage Considerations for Retrofit of Base Flow Weir Gauges* (page 395)
- Phil Slessar: *Flows, habitat, connectivity and cooperation: recovering native fish in northern Victoria* (page 445)

<http://9asm.org.au/assets/9ASM-Complete-Proceedings-2018-Final.pdf> [This is a 94 MB PDF document without hyperlinks]

New Australia and New Zealand Water Quality Guidelines 2018

The latest revision of the ANZG guidelines for fresh and marine water quality have recently been released and are available as a fully updateable online resource here:

http://waterquality.gov.au/anz-guidelines?mc_cid=0b63725565&mc_eid=a9fd0dd6b4.

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Australian National Sportfishing Association - NSW
www.ansansw.com.au

Capital Region Fishing Alliance [http://crfa.org.au/](http://crfa.org.au)

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

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

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

NSW Fishing Clubs Association www.nswfca.com.au

Ozfish Unlimited [ozfish.org.au/](http://ozfish.org.au)

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

Recfish Australia [http://recfishaustralia.org.au/](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 Dept of Environment, Land, Water and Planning (DELWP)
www.delwp.vic.gov.au

Victorian Fisheries Authority: <https://vfa.vic.gov.au>

VRFish www.vrfish.com.au

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