

Newstreams

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

Welcome to Newstreams #70, the first for 2020. In the face of the many challenges affecting fish and their habitat, it is a pleasure to find stories about people working hard to restore habitat and fish populations. I hope you find inspiration for your own fish habitat activities!

Newstreams is brought to you in partnership by the [Fish Habitat Network](#), with funds from the [NSW Recreational Fishing Trust](#). As well as [Newstreams](#), the recreational fishers of NSW also support fish habitat action on the ground through the [Habitat Action Grants](#), [website](#) and [Facebook](#).

Liz Baker, [Editor](#)

AUSTRALIAN NEWS

Fish habitat horror season

While *Newstreams* focuses on the great work people are doing to rehabilitate fish habitat, it has to be acknowledged that this Australian Summer has been a horror story with drought, fires, then heavy rain and floods affecting most of the country in the past six months. Fish have been affected by the damage to the natural infrastructure that supports fish (<https://www.theguardian.com/environment/2020/feb/12/triple-whammy-hits-push-australian-rivers-crisis>) and the loss of areas of rehabilitation to bushfires (<https://www.fishingworld.com.au/news/impacts-on-waterways-after-bushfires>). There have been multiple fish rescues in several states, including as part of the NSW Native Fish Drought Response (<https://www.dpi.nsw.gov.au/about-us/media-centre/releases/2020/threatened-fish-rescued-across-the-state>), due to drying rivers and in the face of bushfires (<https://www.environment.nsw.gov.au/news/stocky-galaxias-rescued-from-fire-affected-creek>). Efforts to save the Macquarie Perch in southern NSW have been set back by ash-laden silt and rivers devoid of oxygen, but rescuers have found a few fish are surviving even in these conditions (<https://www.theguardian.com/environment/2020/feb/15/last-population-macquarie-perch-nsw-river-carnage-bushfire-ash-fish-species>). A combination of water quality monitoring, installation of aerators and water for the environment (<https://www.environment.nsw.gov.au/news/flows-for-fish-in-the-gwydir-river-system>) have helped keep fish alive through summer. Native fish populations have been under significant stress for several years and this summer has stretched their resilience even further. Work on fish habitat, restocking from rescue populations and other recovery actions when conditions improve will give our fish a chance to recover.

Remembering the good stuff: habitat rehabilitation showcase

The Habitat Action Grants are funded from the NSW Recreational Fishing Trusts with funds generated by the NSW Recreational Fishing Fee. Between 2008 and 2018, the Habitat Action Grants Program invested over \$5 million in on-ground fish habitat rehabilitation projects in both freshwater and coastal environments. Some of the projects, and what the work has meant for the recreational fishers involved, are showcased in the following videos for both [inland](#) and [coastal](#) areas.

Red Cliffs re-snagging

Dozens of snags of various shapes have been placed into the Red Cliffs reach of the lower Murray restoring a stretch of habitat more than one and a half kilometres long. The location was determined based on mapping work done by the local OzFish members which highlighted areas of the river lacking snags and in need of restoration.

More: <https://ozfish.org.au/2019/12/more-snags-in-the-murray-rive-means-more-fish/>.



The location of the introduced snags was based on habitat mapping work. Photo: OzFish Unlimited.

Sowing the seeds of restoration

Western Australia's Cockburn Sound has lost 80 per cent of its seagrass meadows, an important habitat for Pink Snapper, as well as crabs, prawns and Southern Calamari. Recreational fishers and divers have been working to restore the seagrass by collecting and spreading seeds. While out boating, volunteers have been using hand nets to collect the fruit pods in the Cockburn Sound. Flower pods or fruit containing the seed float to the water's surface before being driven by wind and collected by currents forming floating wracks. While the collectors did not quite make the goal of 1 million seeds due to poor weather, thousands of seeds were collected and dispersed into the restoration site. More: <https://ozfish.org.au/2019/12/snapper-habitat-gets-second-dose-of-seagrass-seeds/>.



Sowing the seeds of restoration of Pink Snapper habitat in Cockburn Sound. Photo: OzFish Unlimited.

New pest algae spotted

Two non-native marine seaweed pests have recently been detected in Botany Bay, NSW. It is the first sighting of the red macroalga *Grateloupia turuturu* in NSW waters, and the first detection in Australia of *Pachymeniopsis lanceolate*. Both species can out-compete many native seaweeds within the low intertidal and shallow subtidal zones due to their large size and ability to reproduce quickly.

More: <https://www.dpi.nsw.gov.au/about-us/media-centre/releases/2020/non-native-marine-algae-detected-in-botany-bay>.



Grateloupia turuturu is an unwelcome find in Botany Bay. Photo: Parks Victoria.

Fish like it extra salty

The excess hypersaline water pumped into the ocean from Sydney's desalination plant at Kurnell increased fish life by 279 per cent when the plant was in operation. Researchers monitoring the fish numbers and species in the discharge area, both before and after the plant was operating, saw a general increase in fish numbers at the site. There was a 133 per cent increase in fish targeted by commercial and recreational fishers within a 50-metre radius of the outlet. Exactly why the fish were attracted to the area remains unknown. More:

<https://www.abc.net.au/news/2019-12-19/sydney-desalination-plant-discharge-boosts-fish-numbers/11811650>.

Irrigation pump screen on trial in the Condamine

Irrigation pumps can suck up around 1200 fish under 100 mm long per megalitre of water as well as older large-bodied fish. A new and self-cleaning irrigation screen, widely used in New Zealand to prevent loss of whitebait, is now being trialled in Oakey Creek – a tributary of Queensland's Condamine River. More: <https://finterest.com.au/queenslands-dewfish-reach-installs-irrigation-screens-to-save-our-native-fish/>.

Operation Crayweed sees fish on-site

Crayweed is a type of seaweed that was once plentiful on Sydney's coast until it disappeared from a 70 km stretch of the coast between Palm Beach and Cronulla in the 1980s. It is suspected that sewerage pollution was largely to blame. With improvements in water quality, efforts are underway to restore the Crayweed. Adult plants are harvested from Wollongong and the Central Coast then attached to underwater mats ready to be translocated. The plants cannot establish new roots but they can reproduce. The translocation was carried out in April 2019, and the next day fish were using the Crayweed mats as habitat, and other species were eating the plants. The plants have reproduced successfully and already some of the offspring are up to 17 cm tall. More: <https://www.theage.com.au/environment/conservation/the-conservation-effort-returning-lost-seaweed-to-sydney-s-shores-20200115-p53rsq.html> or a video: <http://www.operationcrayweed.com/>.



Fish are already using the areas where young Crayweed is re-establishing. Photo: Derrick Cruz.

Kickstarting recovery of reef fish populations

Healthy reefs are noisy and young fish, including species essential to reef rehabilitation, hone in on the sound of a healthy reef when they're looking for a place to settle. A degraded reef is less noisy and less attractive to these fish. Researchers have found that playing the sounds of healthy coral through loudspeakers can lure fish back to degraded reefs. Areas of dead coral on the Great Barrier Reef where the loudspeakers were used had twice as many fish and 50 percent more species than areas without the sounds. The fish also arrived sooner and stayed longer. For full reef recovery, however, there needs to be more than dead coral for the fish to stay. Read a summary: <https://www.smithsonianmag.com/smart-news/loudspeakers-lure-communities-fish-back-degraded-coral-reefs-180973685/> or the full article by Gordon and others in *Nature Communications*: <https://www.nature.com/articles/s41467-019-13186-2> [Open Access].

Southern Pygmy Perch back in Bendigo

Southern Pygmy Perch went extinct locally around Bendigo, central Victoria, during the 1850's gold rush and are practically extinct throughout the state. Hundreds of these fish have been released in a conservation restocking effort into the Bendigo and Axe Creek area, chosen because the creeks can now be classified as rehabilitated habitats. For the past five years, the local city council has been preparing for this release by constructing small ponds suitable for small-bodied native fish in the catchment. These works have improved storm water flows and created better fish habitat. More: <https://www.mcvortimes.com.au/news/2020/01/27/1004575/extinct-fish-swims-again-in-bendigo-and-axe-creeks>.

Carp gone from Lake Sorrell

Carp were found in Tasmania's Lake Sorrell in 1995. The waterways were closed to fishing to prevent further spread of the pest fish. In 2009, the eradication program had removed tens of thousands of Carp and was thought to have succeeded, but the 50 or so fish that remained spawned. In addition to the previous tactics, male Carp were implanted with GPS trackers to discover preferred spawning habitats and netting efforts were concentrated in those areas. In the 2019 / 2020 summer, the Carp caught were stunted, and the females still had their eggs, evidence that they had not spawned. More: <https://www.abc.net.au/news/2020-02-05/carp-success-lake-sorrell-reopens-trout-fishing/11932166>.

Seahorse hotels a success

Lost commercial fisher traps were the inspiration for seahorse hotels. The initial success of the hotels has continued. It took only two months from when they were installed for Seahorses to start using the structures. Over time, the numbers of seahorses using the hotels has been found to gradually increase and at least 64 different individuals over the next 12 months were recorded. Some seahorses maintained a strong attachment to the hotels and were spotted regularly on the monthly surveys. The project has led to international interest, with more hotels being trialled in Greece, the United States, Philippines and Indonesia. More: <https://www.scu.edu.au/engage/news/latest-news/2020/to-save-these-threatened-seahorses-we-built-them-5-star-underwater-hotels.php>.



A pregnant male seahorse was found living on the seahorse hotels for a few months. Photo: David Harasti.

Tweed River ready to see what difference more habitat makes

The Upper Tweed River on the northern NSW coast is about to get more fish habitat so local fishers decided to find out what the baseline fish population was and where the fish were. The sampling found many more fish in locations with woody snags, compared to locations with no snags at all. More than 1,000 fish were observed among the fallen timber and root systems, compared to 31 fish in locations with no snags. Seven species of fish were also found around snags compared to two species without snags. The greatest number and variety of fish were found at sites with a combination of both woody snags and riparian vegetation. Now the fishers are ready to add more snags and re-plant riparian areas. More: <http://northernriverssportfishing.com.au/wp-content/uploads/2019/12/Fish-Monitoring-Survey-for-the-Upper-Tweed-River-Estuary-Riparian-and-Aquatic-Habitat-Rehabilitation-Project.pdf>.

The habitat preferences of juvenile native fish

Researchers gave juvenile Murray Cod, Golden Perch and Silver Perch, as well as adults of several other species, a choice of habitat: open sandy habitat, submerged macrophytes, emergent plants or rocky rubble. The Murray Cod and Golden Perch preferred structure over open sandy habitat, while Silver Perch did not avoid open sandy habitats. Juvenile Murray Cod preferred rocky rubble habitat over all other habitat choices. Use of emergent plants, submerged macrophytes and rocky rubble for habitat restoration all appear to have merit for one or more species of small-bodied fishes or juvenile stages of larger sized fishes. Read more of this work by Hutchinson and others in *Ecological Management and Restoration*: <https://doi.org/10.1111/emr.12394>.

Habitat rehabilitation provides a home for Eel-tailed Catfish

In the 1930s, catfish were common in Victoria's Ovens River but its range and abundance has declined due to various threats. Locals have spent years at the Mullinmur Billabong on the Ovens River managing weeds, planting native species, removing carp and delivering water for the environment to create healthy fish habitat. In NSW, Barham Lake is critical habitat for Eel-tailed Catfish but the lake was drying rapidly. Scientists collected these threatened fish and moved them to their new habitat-ready home 250km away. More: <https://www.water.vic.gov.au/media-releases/2019/cross-border-catfish-250km-journey-to-new-home>.



One of the Catfish being re-located to a restored habitat site 250km away. Photo: Renae Ayres.

Restoring Salmon to Sheffield wins the prize

The Don Catchment Rivers Trust have been awarded the Prix Charles Ritz for their 'Living Heritage of the River Don' project. As a result of the project, Salmon are now reappearing in the post-industrial heart of Sheffield to spawn after an absence of 200 years. After feeding near Iceland for most of the year, Salmon make their way inland upstream to lay their eggs and the first point they can do this on the Don is in Sheffield. Over 350 volunteers and 43 community organisations have been involved, improving fish passage with the construction of passes and removing 4300 bags of litter from the river. Over 1,000 children became a 'River Guardian'. More: <https://doncatchment.wordpress.com/>.

4 years of mining and 40 years of rehabilitation – now the fish are back

In 1967, the Mount Washington copper mine on Canada's Vancouver Island went bankrupt leaving behind mounds of copper ore and waste rock. In following decades, Pyrrhotite Creek carried toxic effluent from the site, killing the Tsolum River. In the 1940s, the Tsolum was an angler's paradise, with large numbers of Pink, Coho, Chum and Steelhead Salmon. However, acid runoff from the mine degraded the health of the river, making it hostile to Salmon, Trout and the freshwater invertebrates on which young fish depend. By the late 1980s, copper levels in the Tsolum ranged between 70 and 90 parts per billion – four to six times higher than the level considered to be toxic to fish over the long term.



The Tsolum River responded quickly to the reduction in acid mine drainage. In 2015, about 6 years after new techniques were used, 129,000 Pinks came back to the river — a record return since fish counts began in 1953. Photo: Taylor Roades / The Narwhal.

The first major reclamation effort took place between 1988 and 1992 and involved covering the mine waste with a cap of glacial till and building a channel to divert water around the contaminated area. Subsequent water testing revealed the effort was a failure. In 2003, Pyrrhotite Creek was diverted into a natural wetland, and using it to filter out metals before the water made its way into the river worked in part. Then a technique that had rarely been used for mine closures was tried: the mine waste was capped with 128,000 tonnes of glacial till, then a half-centimetre-thick layer of bitumen sandwiched between geotextile fabric was laid, followed by another metre of glacial till. The site was then covered with logging debris and replanted with alder to control erosion. Fish responded quickly. A little more than three years after the works, roughly 61,800 Pink Salmon returned to spawn in the Tsolum, the largest return since the 1950s. More: <https://thenarwhal.ca/three-years-of-mining-40-years-of-taxpayer-clean-up-for-river-downstream-of-vancouver-island-copper-mine/>.

First habitat, then fish

The River Great Ouse in East Anglia, UK, has been the focus for habitat restoration work including gravel enhancement and cleaning, improving cover for fish foraging and resting, and improved fish passage, with aim of improving the river and securing a self-sustaining fishery. A pollution event in 2018 resulted in a significant fish kill so thousands of fish, including Barbel, Dace, Roach and Chub, have been restocked into those areas where habitat has been rehabilitated to kick-start the fish populations. Crucian Carp were also released into ponded areas. More: <https://www.gov.uk/government/news/river-great-ouse-gets-christmas-present-with-fish-restocking>.

Trout have new hiding places

In April of 2014, fishers stood in Oatka Creek in upstate New York, USA and watched the mass hatch of mayflies come off in clouds but they saw no fish rise to eat them. This was a result of cold winters, then hot and dry summers and a lack of habitat, especially shelter from predators. By the end of 2019, local fishers had 70 habitat installations in place in Oatka and Spring Creeks. The habitat structures were made from nearby dead trees with the root ball intact, cut to length, driven into the bank for about 10 feet just beneath the water's surface, and then pinned in with the stone on either side. More: <https://www.tu.org/blog/seth-green-chapter-seeking-to-restore-a-paradise-lost/>.

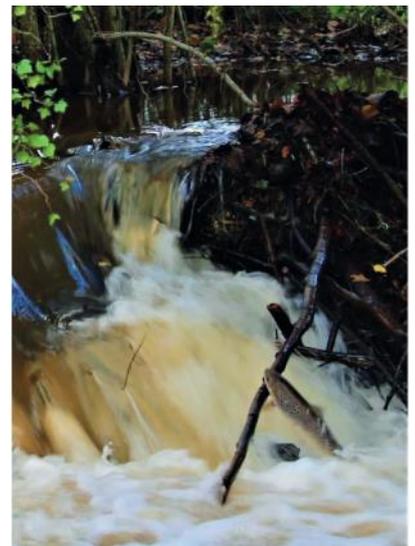


The newly installed structures give fish a chance of survival in an area that had previously left them exposed to predators. Photo: Trout Unlimited.

Beavers and fish?

Monitoring of the colonisation phase of Beavers into the River Otter and the River Tale in Devon, UK, has concluded that the Beavers' modifications to habitat have a mix of positive and negative impacts on fish. By constructing dams, the Beavers reduced peak flows and created and managed new areas of wetland habitat. Electrofishing of one of the Beaver pools found total abundance was 37 per cent higher than in other reaches, and more Trout were present than in either the upstream or downstream control sites.

These differences are thought to be driven by the contrast in habitat type brought about by the beaver dams - some deep slow water, some shallow faster water. The shallow, swift-flowing conditions created where a previous Beaver dam had washed away provided good habitat for juvenile trout which were abundant. The River Otter catchment was once recognised as an important river for breeding Atlantic Salmon. With so few Beaver dams coinciding with Salmon runs, there were very few opportunities to investigate the impacts of Beaver dams on Salmon migration, although Sea Trout were observed migrating upstream at a Beaver dam site. A critical factor appears to be how much room the river itself has to move and adjust to the Beavers' modifications. More: <http://www.exeter.ac.uk/crew/research/beavertrial/#read>.



Several small and large Trout were successful in negotiating this Beaver dam. Photo: Roger Auster.

Whitebait and Eels benefit from transformation

In 21 years, New Zealand's lower Waiau River has been transformed from predominantly bare farmland into thriving wetland habitats, to the benefit of Whitebait and Longfin Eel populations. Over 65 hectares of wetland have now been protected, with more than 90 interconnected wetland habitats and 50 hectares of open water habitat. 118 km of fences have been erected to protect 384 ha of riparian vegetation.

More: http://waiaustrust.org.nz/sites/waiaustrust.org.nz/files/pictures/Documents/NZ_Herald_Dec-2019_Rakatu_Wetlands.pdf.



The area now known as the Rakatu Wetlands, before (left) and now (right). Photo: Waiau Trust.

Trout 'sound out' habitat

Researchers studying how underwater sounds affect habitat use by freshwater fish have found a positive relationship between the numbers of Brook Trout densities and broadband sound pressure levels, irrespective of water velocity and depth. It appears there is an interaction with habitat type. Brook Trout might be using the underwater soundscape to select favourable feeding habitats. More of the study by Kacem and others in the *Canadian Journal of Fisheries and Aquatic Sciences*: <https://doi.org/10.1139/cjfas-2019-0311>.

River Stour habitat improvements

The improvements on a stretch of the River Stour at Friars Meadow in Sudbury, UK, involved bridge repairs, tree surgery, large scale removal of silt and vegetation and the creation of spawning areas. The changes should also encourage fish to spawn and improve the water quality. More: <https://www.gov.uk/government/news/fishing-licence-fees-help-restore-a-suffolk-river>.

Food makes a difference if the water is warm

Warm waters are a threat to cold water fish like Salmon and Trout. Researchers have found that habitat with abundant food sources may help buffer the effects of increasing water temperature. They identified that the availability of food in a natural system, not just stream temperature and flows, is an essential component of fish habitat. The researchers reared juvenile Coho Salmon in a series of enclosures within the Shasta River basin, USA, and found higher than expected growth rates during periods of high-water temperature. The availability of food was the critical factor. Fish metabolism increases as they warm up and if there is enough food around them in the form of aquatic invertebrates, it can help compensate for increases in temperature – up to a point. The researchers point out that many rivers inhabited by salmon are either nutrient-poor or are fundamentally altered and lack the food supply that might help Salmon cope with warmer water.

More: <https://www.nrcresearchpress.com/doi/story/10.4141/news.2019.12.10.100665>.

Salmon success in Denmark

The management approach used to restore Danish Atlantic Salmon populations in four major Danish rivers included changes in legislation, stocking practices, habitat restoration, population genetics and barrier removals. Read more of this review by Koed and others in *Fisheries Management and Ecology*: <https://doi.org/10.1111/fme.12385>.

Good news in a dry year

The installation of gravel beds in the Elan River, Wales, and changes to the way in which water is released from the dams to consider the needs of migratory fish, has meant much more of the river is now available to Salmon. In 2019, Salmon were found to have spawned in the Elan's newly introduced gravel for a second consecutive year. Salmon fry are now present in these areas and there has been a large increase in fry and parr numbers further downstream. Juvenile Salmon were also found further upstream than ever before. Salmon fry were found in 4 sites and trout fry at 6 of the 7 monitoring sites within the section that was previously denuded of gravel and fishless. This recovery in fish populations has followed a marked improvement in the river's invertebrates, which are the essential food source for juvenile Salmon and Trout of all sizes. More: <https://www.wyeuskfoundation.org/news/more-good-news-from-river-elan>.

Removing barriers works

A study of Chinook and Steelhead Salmon populations and habitat attributes at 32 culvert removal or replacement projects in the Columbia River Basin, USA, found no significant difference between the upstream and downstream sites. This suggests that these barrier removal projects have led to adequate fish passage, increased habitat availability and increased juvenile Salmon abundance immediately upstream of former barriers. Read more of the study by Clark and others in *Fisheries Management and Ecology*: <https://doi.org/10.1111/fme.12410>.

RESOURCES

Special Issue of *Freshwater Biology* - *Passive acoustics: a new addition to the freshwater monitoring toolbox*

A collection of articles relating to the use and potential of passive acoustics for monitoring in freshwater environments: <https://onlinelibrary.wiley.com/toc/13652427/2020/65/1>.

HydroATLAS

HydroATLAS is a high spatial resolution atlas that maps the environmental characteristics of all the globe's rivers and catchments. This standardised compendium that collates more than 50 environmental variables representing over 280 individual attributes will assist researchers and practitioners address gaps in river or catchment protection methods and understand the human impact on freshwater ecosystems. More: <https://phys.org/news/2019-12-hydroatlas-earth-river-catchment.html>.

National Recreational Fishing Conference 2019 (Australia)

Videos of the conference presentations are available: <http://www.arff.net.au/nrfc-2019-session-videos/>.

ABOUT NEWSTREAMS

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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>.

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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/](http://crfa.org.au)

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

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

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

NSW Fishing Clubs Association www.nswfca.com.au

OzFish Unlimited <http://www.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