

Newstreams

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

Welcome to Newstreams #73. As we come to the end of 2020, it's heartening to find stories of people continuing their efforts to rehabilitate fish habitat across Australia and in so many other countries despite the challenges the year has brought. We hope you find something in these stories that makes you feel proud to be involved in whatever way you are in this much needed work to restore our native fish.

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

All set for Golden Perch spawning

Golden Perch larvae have been found during routine monitoring in the lower Goulburn River in Victoria. The ideal conditions for Golden Perch spawning are water temperatures between 18°C and 22°C and flows around 7,000 megalitres a day in late spring. These conditions have not been met for several years. Now, water temperatures are above 18°C and inflows from tributaries after recent rain are providing plenty of food for fish. The good flows in the Goulburn and Murray rivers are allowing fish to move up and downstream and are being augmented with water for the environment to ensure spawning is triggered. Similar river and weather conditions in 2016 led to large-scale Golden Perch movement and spawning. More: https://www.gbcma.vic.gov.au/news_events/golden-opportunity-to-trigger-native-fish-spawning.html.

Black Bream spawning success in Gippsland Lakes

Black Bream spawning success in Victoria's Gippsland Lakes has been recorded at its second highest level of the last ten years. Spawning varies from year to year and is influenced by environmental factors such as river flows and waterway health, however the trend for Black Bream over the last four years is significantly better than the six years prior to that. More: <https://vfa.vic.gov.au/about/media-releases/good-news-for-bream-numbers-in-gippsland-lakes>.



A Black Bream. Black Bream take about six years to reach their minimum size of 28cm. Source: lachlanf / iNaturalist.org. License: CC by Attribution-NonCommercial.

A unique approach to seagrass restoration

Another method of restoring seagrass is underway at Mourilyan Harbour, south-east of Innisfail in Queensland. The method being trialled attached seagrass fragments (called 'sprigs') to mesh frames which are then installed into a designated section of the harbour. Mourilyan Harbour once had dense and productive seagrasses however the meadows were lost in 2010 after major storm damage and have failed to return due to their isolation from other seagrass areas. More: <https://www.fishingworld.com.au/news/seagrass-restoration-kick-started-at-mourilyan-harbour-innisfail>.

10m fish grotto installed off the Tweed River

This artificial reef is deployed in 25 metres of water offshore and south-east of the Tweed River mouth in north-east NSW. It consists of a 10-metre-high steel 'fish grotto' surrounded by 32 concrete modules, each standing five metres tall. More: <https://www.fishingworld.com.au/news/tweed-reef-deployment-underway>.

Fish screens – benefits for fish, fishers, irrigators, communities

In 1929, a Fisheries Inspector recommended the “installation of screens at all irrigation and other pumping plants” (Register News-Pictorial 1929) because hundreds of fish were being diverted into irrigation channels. The contemporary impacts of pumped diversions are difficult to precisely quantify, however we know they are significant compared to our broader restocking efforts of recreational species. <https://fishscreens.org.au/evidence/scientific-evidence-of-fish-losses/>). In June this year, 1,207 Murray Cod, 143 Golden Perch, 199 River Blackfish and one Silver Perch were rescued from irrigation channels off the Murray River that were being dewatered (<https://www.facebook.com/VictorianFisheries/videos/1160954320941332/>).



Fish exclusion screens provide more efficient irrigation and can reduce losses of native fish by 90%, supporting other fish rehabilitation efforts. Photo: fishscreens.org.au

A fish exclusion screen acts as a physical barrier to stop fish being sucked into large pipes, lost to the river system and/or macerated. Modern screens have a large surface area, fine mesh and are self-cleaning. They reduce the velocity of water entering a water intake, without affecting the volume. As well as saving hundreds of fish a day, it means irrigators do not have to deal with dead fish in pipes and pumps, which is costly and unpleasant. Several fish exclusion screens have now been installed, including a large screen on a major pump that feeds 33 farms from the Macquarie River, near Trangie in central west NSW (<https://www.abc.net.au/news/2020-06-19/state-first-as-fish-exclusion-screen-installed-near-trangie-nsw/12343218>). Read more about the research and application of fish screens in Australia: <https://fishscreens.org.au>.

Cold water pollution blues

In central west NSW, the failure of Lake Burrendong's cold water pollution curtain has unfortunately resulted in another season of lower temperatures in the Macquarie downstream of the dam wall. The water being released from the dam can be up to 10 degrees cooler than waters flowing into the storage and has impacted temperatures over 100km downstream. Fish like Murray Cod, Yellowbelly, Silver Perch and Trout Cod were expected to be breeding in the affected reach. The Burrendong thermal curtain has had ongoing reliability issues since its installation in 2012. More: <https://www.fishingworld.com.au/news/fish-breeding-event-killed-macquarie-river>.

Researchers studying the impacts of cold-water pollution on the larvae of Silver Perch, Trout Cod and Golden Perch found that that low water temperatures resulted in reduced body size, particularly in terms of body width and head size. While not lethal, the larvae do not grow as well or as quickly, making them more susceptible to predation and more restricted in terms of the food they themselves can eat. More of the research by Michie and others in *Environmental Biology of Fishes*: <https://doi.org/10.1007/s10641-020-01041-z>.

'Cold shock' is another impact of cold-water pollution. Researchers have found that cold shock caused mortality and reductions in swimming ability in larval and juvenile Murray Cod, Silver Perch and Golden Perch. A 10°C drop in temperature caused the highest mortalities. More of the research by Michie and others in *Conservation Physiology*: <https://doi.org/10.1093/conphys/coaa092>.

Water helping fish and reducing blackwater risk

Water for the environment delivered across the lower Loddon River, Serpentine Creek and Pyramid Creek in north-central Victoria have benefited native fish, such as Murray Cod and Golden Perch, and now Murray Darling Rainbowfish are also showing signs of responding. However, the water for the environment is also aimed at reducing the risk of blackwater events this summer. The flows are washing the accumulated leaf litter away while the weather is still relatively cool. More: <http://www.nccma.vic.gov.au/media-events/media-releases/importance-fish-friendly-flows>.

Not all blackwater is bad. Good blackwater often has a pale brown appearance and naturally occurs due to the breakdown of leaf litter and other vegetation falling into the river. This type of blackwater gives a boost to the food web in the forest, creeks, and river. A video explaining the causes and effects of blackwater can be accessed here: <https://www.vrfish.com.au/2020/11/12/risk-of-blackwater-this-summer/>.

Life in the weir pool is a little bit the same, little bit different

Golden Perch and Murray Cod living in a weir pool on lower Broken Creek in south-eastern Australia showed some behaviours in common with fish living in the main river channels. The main difference researchers found between the two populations was that the weir pool-based fish rarely undertook the journeys of tens to hundreds of kilometres that river-based fish are known to do. Golden Perch were observed using woody habitat in much the same way in the two sites. The movements of the Murray Cod in the weir pool were characterised by shifts away from usual locations for one to two days, or shifts to new areas for four to six weeks followed by return movements to areas previously occupied. Read more of this work by Koster and others in *Fish Biology*: <https://doi.org/10.1111/jfb.14275> [Open access].

Habitat helps Southern Pygmy Perch

Monitoring has shown substantial rises in the population and distribution of Southern Pygmy Perch since 2017. After extended periods of decline and low numbers, including a massive decline as a result of the 2010 floods, the population has staged a significant recovery in the Coppabella Creek in southern NSW. The long-term conservation program has focussed on addressing the loss of aquatic plant habitat. Carp had contributed to the loss of aquatic plants and a key part of the program has been to repair an existing barrier to prevent Carp entering this area of Southern Pygmy Perch habitat. Other works have included fencing, weed control, and revegetation of riparian areas. More: <https://www.lls.nsw.gov.au/news-and-events/news/m-news/2020/pygmy-perch-makes-a-comeback>.

Fish already know about this giant reef

New mapping of Australia's underwater environment has 'found' a 500m high, 1.5km wide reef offshore of Cape York Peninsula on a deep ledge extending out from below the Great Barrier Reef shelf. Plenty of reef fish have already been spotted around it, from small Hatchetfish to Grey Reef Sharks. It is also home to an abundance of sponges, sea fans, and soft corals. A four-hour video of the submersible's travels around the reef is available [here](#), or read more: <https://www.sciencealert.com/a-new-reef-discovered-off-australia-s-coast-is-taller-than-the-empire-state-building>.



One of the fish spotted living on the newly found reef. Sourced from the video, Schmidt Institute.

Deniliquin Lagoons get more habitat

The recent addition of fish hotels and additional riparian vegetation is part of the longer project to restore the Deniliquin Lagoons in southern NSW. As well as a breeding population of Eel-Tailed Catfish, the lagoons also support the threatened Southern Pygmy Perch. The water levels in the lagoons are managed to mimic natural flow patterns, and the lack of snags has meant the fish have been more vulnerable to bird predation during low-water periods. More: <https://www.riverineherald.com.au/2020/11/15/2066448/new-fish-habitat-in-deniliquin-lagoons-for-threatened-species>.

Riparian work part of the process to 'Heal the Peel'

Over the last few years, the fish in the Peel River in central NSW have had been through fish kills and fish rescues and the river itself has suffered from drought and a range of ongoing pressures. One very neglected 5 km stretch close to the Tamworth town centre has been the focus of willow control and replanting, with 1,000 native trees and shrubs planted in the riparian area. This work has added value to the previous habitat rehabilitation work and by being the link between these projects creates a larger stretch of rehabilitated riverbank. More: <https://ozfish.org.au/2020/11/peel-river-set-to-begin-healing/>.

Once a Darling River, even in drought

Researchers have found that under natural conditions the Darling River once flowed 85 per cent of the time, even during the worst droughts on record, including the Federation drought from 1895 to 1903. Documentation showed that during historical droughts, flows in the Darling River exceeded 700 megalitres per day at Walgett and 1,300 ML/d at Wilcannia and Menindee 50 per cent of the time. In contemporary droughts the flows were 175 ML/d at Walgett, 70 ML/d at Wilcannia and 195 ML/d at Menindee. The zero flow and extremely low flows in the river during the last drought have been exacerbated by diversions. In addition, weir-pools create artificial still-water conditions that can favour alien species such as carp for around 1000 kilometres – that is 40 per cent – of the river.



Water flowing down the Darling River for the first time in 2 years earlier this year.
Photo: Rachel Strachan.

Some of the recommendations for maintaining flows in the river during drought include managing flow differently using depth, velocity, and turbulence, instead of focusing on volume in order to improve the environment for fish, and creating better linkages between the management of tributary flows which supply 99 percent of the water into the Darling River. Read a summary here: <https://www.theland.com.au/story/6960892/finding-the-darlings-flows/?cs=4941> or the research by Mallen-Cooper and Zampatti in *Ecological Management and Restoration*: <https://doi.org/10.1111/emr.12428> or full text: <https://res.cloudinary.com/ozfish-unlimited/images/v1602124295/Mallen-Cooper-and-Zampatti-2020-Darling-River/Mallen-Cooper-and-Zampatti-2020-Darling-River.pdf>. A video presentation by Mallen-Cooper on this research can be accessed here: <https://www.youtube.com/watch?v=Sxn2yCYrvDk&feature=youtu.be>.

Four years of fishers, fish, and riverbanks

Four years of the Angler Riparian Partnerships Program has seen 1,045 volunteers from 156 angling clubs and community groups repairing land along 30 waterways across Victoria. 70km of riparian land has benefitted from the planting of over 41,555 native trees and the control of 174 hectares of weeds. More about the projects: <https://www.vrfish.com.au/2020/10/31/recognising-four-years-of-the-angler-riparian-partnerships-program/>.

INTERNATIONAL NEWS

Walking the 'why' of habitat rehabilitation on the River Wye

Over the past 25 years, habitat rehabilitation projects along the Wye and Usk Rivers in Wales have removed 117 weirs, built fish passes through other weirs, and re-introduced thousands of tonnes of new gravel. Local farmers are also reducing phosphate-laden run-off entering the river. Take a descriptive walk past some of these Salmon rehabilitation projects on the Wye here: <https://www.theguardian.com/travel/2020/nov/08/walking-the-river-wye-trail-salmon-conservation>.



The reintroduction of gravel has seen a four-fold increase in fish at this the sample site. Photo: Wye and Usk Foundation.

The conservation work is proving successful. Surveys of the Elan River, a tributary on the upper Wye River, this year found Salmon fry at every survey location for the first time, including as far upstream as the gravel introduction site just below Caban Coch, the lowest dam on the Elan. For the first time since surveys began in the 1970s, the whole length of the Elan is now being used by Salmon to spawn in. In 2016, the average number of Salmon fry at each survey site was 1.1. In 2019 this had increased to 11.8 and in 2020 the average was 20.7. In addition to Salmon fry, the numbers of both Trout fry and adults have more than doubled since the project started in 2016. More: <https://www.wyeuskfoundation.org/news/twentyfold-increase-in-the-elans-salmon-fry-since-2016>.

Fix the barriers and the Trout move on and through and up

In 2012-2013, Cutthroat Trout were almost completely absent from the reach of Poose Creek in Colorado above the one road crossing but relatively abundant in the reach below the crossing. Long-term monitoring showed that Trout densities were 0 fish per mile upstream of the culvert and approximately 437 fish per mile downstream of it. A fishway was constructed and within a year Cutthroat Trout began using it. The same long-term monitoring station that contained Cutthroat Trout at a density of 0 fish per mile in 2012 contained them at a density of approximately 2,752 fish per mile in 2020. In addition, the presence of multiple age classes, and, in particular, of young-of-year fish confirmed that Colorado River Cutthroat Trout were spawning in and recruiting to the headwaters of Poose Creek. More: https://www.tu.org/blog/potentially-immeasurable-benefits-of-fish-habitat-connectivity/?_zs=sdJCb&_zl=GlrJ2.



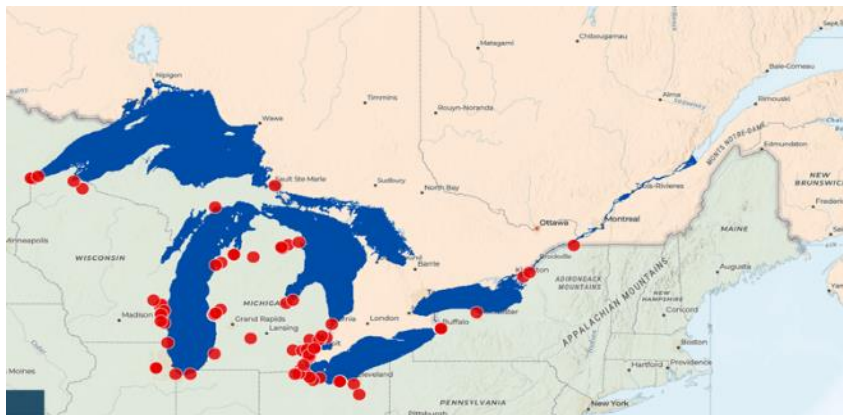
Cutthroat Trout making their way upstream in response to the removal of a significant barrier. Photo: Brian Hodae / Trout Unlimited.

Fish thank farmers for the fences

Riparian areas from which stock are excluded and that have a mixture of grasses, shrubs and trees, and little ridges, dips and hollows are very effective at capturing and retaining run-off and reducing the sediment and pollutants that otherwise would be entering waterways. A technical report into the ways in which riparian vegetation and topography intercept pollution and buffer waterways demonstrates multiple benefits for fish and fishers (<https://www.gov.uk/government/publications/3d-buffer-strips-designed-to-deliver-more-for-the-environment>). In a short video, a simple tin can shows very clearly the difference in permeability between stocked grassy areas, unstocked grass areas and mixed vegetated areas: https://youtu.be/00tcTY_UEk4.

The Great Lakes – a challenging restoration journey

The Great Lakes in the central north USA is the largest freshwater system on earth, and supports recreational and commercial fisheries, industry, transportation, recreation, and tourism. The quality and quantity of habitat for fish, such as Lake Whitefish, Walleye, Yellow Perch, Ciscoes, Trout, and Muskellunge, in the Great Lakes has declined for decades, affected by degrading habitat, overfishing, invasive species, marine debris, and pollution from oil and chemical spills. The restoration efforts over the past decade involved improving fish passage, cleaning up contaminated debris, restoring coastal wetlands, and removing invasive species, all of which have led to the restoration of than 4,500 acres of habitat for fish and wildlife and opened up more than 500 miles of rivers and streams to fish migration. More: <https://storymaps.arcgis.com/stories/fbf602248e6b4a4ea2d2d507a01ff8c6>.



Restoration projects are found across the Great Lakes. Information about each of the projects can be found on the [storymap](#)) Source: NOAA)

Serving their country again

Across the United States, veterans are getting involved in fish habitat rehabilitation projects, including constructing and installing woody structure to restore Salmon habitat in California's Eel River by, building environments to support White Abalone, and creating living shorelines for oysters in Mississippi. Read more about these projects and the benefits for both veterans and fish: <https://www.fisheries.noaa.gov/feature-story/celebrating-veterans-serving-habitat-conservation>.

Dauber Gill Trout respond to 6 days work

Dauber Gill, a small tributary of the River Nidd in North Yorkshire, England, had some fish in it but the population structure suggested there was a bottleneck in terms of spawning habitat. The stream had been re-aligned, walled and diverted, which meant it did not retain the finer substrate like gravel for trout spawning or invertebrate habitat, or the leaf litter which is vital resource in these upland streams. Ahead of the 2019 spawning season, 30 woody deflectors were introduced to take the sting out of the gradient and to retain the 25 tonnes of approximately 20 mm gravel that was also added. The practical work and surveying accounted for about six days work in total, and within a year there was a positive outcome. Recent monitoring found numbers of Trout were up by about 80 percent, especially in the young-of-year category, despite it not being a good spawning year. More: <https://www.wildtrout.org/wttblog/delighted-of-dauber-gill>.



Dauber Gill – Trout here faced some spawning habitat shortfalls but responded quickly to rehabilitation work. Photo: Wild Trout Trust.

100 years later, Seagrasses in Virginia bays are flourishing again

In the late 1920s, a pathogen began killing seagrasses in the seaside bays along the coast of Virginia, USA. A 1933 hurricane finished them off. For more than a half-century, the bay bottoms were muddy and barren, and the fish, shellfish, and molluscs were gone. Over the past 21 years, more than 70 million eelgrass seeds have been spread in four previously barren seaside lagoons, spurring a propagation of underwater meadows that has so far grown to almost 9,000 acres. Monitoring the restored seagrass meadows has found improving water quality and increasing total finfish biomass. The now rich and abundant fish communities are dominated largely by Silver Perch. Read a summary: https://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=301462&org=NSF&from=news& or the research by Orth and others in *Science Advances*: <https://doi.org/10.1126/sciadv.abc6434> [Open access].



A seahorse at home within the now-restored seagrass meadows. Photo: Virginia Institute of Marine Science.

Habitat restoration in the 'Land of the Giants'

So-called because of the big Rainbow Trout and Brown Trout found there, the Land of the Giant's Beaver Creek in Montana, USA, is being restored to return natural flows and connect the stream to wetlands. The creek is the lone major spawning tributary on this stretch of the Missouri River. Earlier restoration efforts focussed on adding rocks and other hard objects along stream banks (known as 'riprap') to reduce erosion. However, hardening the stream



From little streams, big fish grow. Photo: Thom Bridge.

banks caused the channel to become more incised and made it harder for vegetation to take hold. That led to increased sedimentation and fewer side channels where fish could shelter. Now, the natural floodplain and channel being reconstructed, and the channel is being altered to create a more meandering flow. The inclusion of woody debris is the next step. More:

https://helenair.com/outdoors/restoration-underway-for-major-trout-spawning-stream-near-helena/article_290eb00a-90ad-5ac0-8d32-21021c60a0a1.html.



One of the 'giants' the area is known for. Photo: www.crosscurrents.com.

WATCH THIS SPACE

4 dams, 1 river, and the rebirth of a fishery

It will be the largest dam removal project in America's history: the simultaneous removal of four dams, with a combined height of 411ft (125m) on the Klamath River in California, USA. The result will be 400 stream-miles of restored habitat for Salmon, Steelhead Trout and Pacific Lamprey, the opening of previously inaccessible spawning grounds, and the reduction of water temperatures in the river as a whole. Watch this story: <https://www.bbc.com/future/article/20201110-the-largest-dam-removal-project-in-american-history>.



At 173ft (53m) high, the Iron Gate Dam is the largest dam set to come down on the Klamath River. Photo: Dave Meurer.

RESOURCES

RiverFest 2020 online

Recordings of the virtual RiverFest for 2020 are available here: https://www.youtube.com/playlist?list=PLtLwIXdmPaFHvATjVqGENUBT5gghhQKr&mc_cid=3562bc972d&mc_eid=a9fd0dd6b4.

Rivers Full of Fish webinars

Two webinars were held as part of World Fish Migration Day 2020 and are now available. Part One: *Transformational Change – A Movement for Rivers* here: <https://www.youtube.com/watch?v=ua3mQPIC6sA&t=3s> and Part Two: *A Celebration of Free-flowing Rivers!* here: <https://www.youtube.com/watch?v=SB4xuxrCZqs&t=24s>.

Living Planet Index for Migratory Freshwater Fish

The Living Planet Index for Migratory Freshwater Fish is the first comprehensive global report on the status of migratory fish. The technical report finds migratory freshwater fish are under immense threat from human-made impacts: https://worldfishmigrationfoundation.com/living-planet-index-2020/?fbclid=IwAR0T8O5vClr-IDxkUlWrgUibk7cR94FC8OnH_CG9gUs_7SAkciktNdvpglU.

More Queensland Catchment Stories

Catchment stories use map journals, integrated spatial information, photographs, animations and an informative narrative to demonstrate the features of catchments. The latest available are the Endeavour catchment, the Jeannie catchment, and the Lake Eyre Basin including the Georgina, Diamantina, and Cooper Creek catchments. More: <https://wetlandinfo.des.qld.gov.au/wetlands/ecology/processes-systems/water/catchment-stories/>.

The ripple effects of Atlantic Salmon conservation - Infographics

Two infographics illustrating the ecological and community benefits arising from restoring habitat for Atlantic Salmon: <https://www.fisheries.noaa.gov/infographic/ripple-effects-atlantic-salmon-conservation>.

European Native Oyster Habitat Restoration Handbook

A “how to” guide for native oyster restoration in the UK and Ireland. The native oyster is now almost extinct in many areas around Europe, having declined by over 90 per cent due to human impacts: <https://nativeoysternetwork.org/resources/>.

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** please fill out 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 Licence fee.

Newstreams is published electronically every three months by the **Aquatic Environment Branch** within NSW Department of Primary Industries - Fisheries 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.



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