

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, and [OzFish Unlimited](#), with funding from the Fisheries Research and Development Corporation, as part of a project to build the capacity of recreational fishers in Australia to address fish habitat issues.

It's also time to revisit what you think about *Newstreams*. We last heard from you in 2010, so please take 5 minutes to fill in the anonymous [subscriber survey](#). Your feedback is appreciated and helps to help *Newstreams* on a tight line. Thank you!

SPECIAL MENTION

World Fish Migration Day 2018

552 events in over 63 countries focussed attention on the highs and lows of fish migration around the world. More: <https://www.worldfishmigrationday.com/> or search the [map](#).

In Australia, there were trees planted for fish in North Queensland's [Burdekin River](#); a celebration of the Dubbo fishway on the [Macquarie River](#), in central-west NSW; celebrity fun and games at [Koondrook](#), in Victoria; and a continuation of the great work being done by for Australian Bass in the Nepean River by [Bass Sydney](#).

In Europe, Rik Bomer made a '[Happy Fish Tour](#)', cycling nearly 4000km across Europe, visiting rivers where fish now migrate and the people who made this happen. The community found out more about the fish habitat in South Africa's [Mooi River](#); and hundreds of people help remove water hyacinth to help [migratory fish in Lake Tana](#), Ethiopia. In England, volunteers helped [Salmon](#) continue their journey to the sea by collecting smolts above a barrier on the River Tyne so they could be relocated downstream. Finnish film-makers have documented the impact of old hydro-infrastructure of the now-endangered Finnish migratory fish species ('[Concrete reasons](#)'). And Jeremy Wade, of *River Monsters* fame, made his plea for flowing rivers and fish access to habitat in a short [video](#).

Celebrating volunteers

Volunteers are in the spotlight during Australia's National Volunteers' Week in May. On behalf of the *Newstreams* team, a big 'thank you' to the many of you who get your hands (and feet) dirty (and wet) to improve fish habitat. Fish can't do it without you!



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AUSTRALIAN NEWS

Bonney fish hero

Kym Manning is a fisher who is leading the way for others who want to make a difference for fish in their local waterway. His focus is Lake Bonney, near Barmera, South Australia. Kym started with an annual fishing competition to get as many Carp out of Lake as possible, then moved onto adding fish hotels to provide much needed fish habitat. Over three years he and his mates have created 90 hotels made into reefs, using about six hotels to a reef, and each with a yellow marker buoy to satisfy government safety concerns. Kym is now getting reports of anglers catching more native fish. Read more: <https://www.weeklytimesnow.com.au/country-living/kym-manning-is-saving-lake-bonney-one-carp-and-one-murray-cod-at-a-time/news-story/e3c9da2eae11de55ef79979b000aaf3c?nk=194ee5cbac2d8c0aee8bb0ad51aff894-1526367064>.



Kym Manning, doing more for fish in Lake Bonney, SA. Photo: OzFish Unlimited

Water comes down, fish go up

Surveys of fish populations along Victoria's Glenelg River have found that native species are benefiting from the improved opportunity to migrate as water for the environment is released downstream of Rocklands Reservoir. Deep pools are being reconnected, which is particularly important during periods of lower rainfall. Juvenile Tupong were found about 180km upstream from the river mouth, which shows the fish have been able to migrate into and up the river during late spring and summer from the estuary. Estuary Perch are also moving back to their old range: they were found more than 270km upstream of where they were back in 2010. More:

https://info.ghcma.vic.gov.au/wp-content/uploads/2018/05/GHCMA_20180507-FINAL-VEFMAP-results.pdf.



Estuary Perch are moving back into old territory in Victoria's Glenelg River. Photo: Scott Thomas, www.fishingworld.com.au.

Fish losing reef habitat

The 2016 underwater heatwave that bleached large areas of the Great Barrier Reef was so severe it transformed the makeup of the reef and removed important habitats for fish. The branching corals that act as a nursery for juvenile fish experienced a catastrophic die-off, which has been followed by a radical shift in the composition of the reef. Large areas of mature and sprawling, intricately shaped corals, such as the Staghorn variety, are being replaced by flat, mound-shaped formations. Branching corals provide the habitat that fish and other creatures rely on. More: <http://www.abc.net.au/news/2018-04-19/marine-heatwave-so-bad-it-cooked-parts-of-great-barrier-reef/9667518>.

Sawfish surprise

A surprise catch of a 2.7m Sawfish 500km from the ocean has led to questions about how many of these rare relatives of sharks are hanging on in remote Northern Territory habitat. Sawfish are not known to live so far inland, but there are signs that the Gurindji people, who are the Traditional Owners, have known of it in the past. Rock paintings in the same remote area clearly show a Sawfish. Scientists are now working with the Gurindji communities to try to understand the importance of this inland habitat. More: <http://www.abc.net.au/news/2018-04-16/sawfish-find-surprise-indigenous-rock-art/9662032>.



The Sawfish, known as "kunpulu" in the Gurindji language, was once known from inland reaches of the Victoria River. Photo: Felicity Meakin

Fishways plus water plus habitat equals fish

Two new fishways in north-central Victoria, on the Loddon River at Canary Island, and Box Creek at Kow Swamp, have opened hundreds of kilometres of feeding and breeding habitat for fish. River regulation has mixed up the cues fish rely on to know when it was time to breed, as well as preventing access to spawning habitat. Fishways are part of the solution, especially when the fish can be encouraged to move upstream at the right time.



One of the Murray Cod making use of improved fish passage in the Loddon River. Photo: NCCMA

Alongside the installation of snags to give fish safe places to rest and feed, fencing off and revegetating waterways to help provide food and clean water, and ensuring water flow at the right time, fishways are part of the reason why monitoring is showing more fish in these rivers. The numbers of fish moving through the Loddon chute fishway increased substantially during coordinated flows. There was also significant movement of both Silver Perch and Golden Perch in the lower Loddon. More: <http://www.nccma.vic.gov.au/media-events/media-releases>.

Naturally the Murray is more than a series of pools

Researching old photographs, early parliamentary reports and 130-year old publications has turned common wisdom on its head. It has long been believed that the Murray River naturally dries to a series of pools during droughts, but the documentation shows that the Murray did not stop flowing naturally. This has implications for thinking about fish. Aquatic scientists and fisheries managers have assumed that the fish living in the Murray must be adapted to pool-like conditions. Now, data suggests that even in droughts the river flowed all the time. Under natural conditions, the Murray River was low in late summer with typical flow of 1000-2000ML per day. Diversion by irrigation pumps quickly reached this capacity and, in 1889, 33 years before the first dam or weir was constructed on the Murray River, the NSW Government reported that pumps could divert more than 1800ML/day and predicted there could be periods of no flow downstream. However, it was not until 1901 that there were a confirmed zero flow event. In 1915 the governments of the day agreed to a schedule of irrigation pumping so downstream settlements could get water: when the pumping stopped, the river flowed downstream again. It appears the Murray River has been transformed from a naturally flowing river, supporting healthy and abundant fish populations and with water extracted for irrigation, to a series of pools with the resultant catastrophic impact on river health and fish. Read more:

<https://www.farmonline.com.au/story/5403208/drought-myth-holds-murray-darling-back/> or access the article by Mallen-Cooper and Zampatti in *Ecohydrology* here: <https://ozfish.org.au/more-fish-in-the-lower-murray-bring-back-the-running-river/>

Black Bream in the Coorong

Black Bream is a long-lived, hardy species common in most estuaries across southern Australia. However, the population in South Australia's Coorong has been in severe decline since the late 1980s, with few if any juveniles recorded in recent years. Late last year an adult female Black Bream was seen below the barrages, in good condition and ready to spawn. In the late Spring and Summer water was delivered to support Black Bream spawning and recruitment. It helped create a salt wedge (an area where freshwater sits above salt water), which keeps Black Bream eggs and larvae buoyant and provides food for the larval fish. The result was more than 100 healthy Black Bream fingerlings were found during monitoring.

More: https://www.environment.sa.gov.au/news/News_Events_Listing/180502-baby-black-bream-fish-return-to-the-Coorong.



Monitoring in Autumn found more than 100 Black Bream fingerlings. Photo: SA Dept of Environment.

31,000 fish in 8 hours

Recent monitoring demonstrated that fishways are providing clear passage for fish to access Mackay's Gooseponds wetlands and connecting it to Janes Creek and the wider Pioneer River Basin, Queensland. In fact, over 31,000 fish successfully ascended the fishway in just 8 hours. The species included juvenile Barramundi, Red Scat, Crescent Perch, Sea Mullet and Empire Gudgeon. Significantly, ongoing monitoring at nearby Boundary Creek wetlands captured 43 Barramundi fingerlings, including the smallest barramundi ever monitored locally at 30 mm. These juveniles could only have used the fishway to move out of their coastal habitats behind the mangroves and upstream into the wetland. More: <http://reefcatchments.com.au/community/31000-fish-all-in-a-days-work/>.



A 30mm Barramundi fingerling. At 30mm fingerlings have only just started swimming. Photo: Catchment Solutions.

Gudgeons making the most of a stormwater drain

Fish, such as Gudgeons, make the most of the habitat they can access. In a North Queensland stormwater drain, Snakehead Gudgeons and Empire Gudgeons got to the business of spawning in response to the summer deluge. In wet years, the flow in the drain can support a freshwater fish community of a dozen species. Paperbarks and beach hibiscus line the drain and the beach hibiscus have grown long trailing roots into the water. An underwater camera caught the spawning fish in the act: <http://queenslandcoast.blogspot.com.au/2018/>.

Northern Basin flow on-track for fish

The Northern Connectivity Event is making its way through major tributaries of the Northern Basin and down the parched Barwon-Darling. The managed flow is connecting tributaries, as well as along the length of the Barwon-Darling itself. Monitoring has found 7 out of the 11 species predicted to occur in the Darling River, but in low numbers. The flow has highlighted the ongoing issue of barriers and the need for fishways. Of the 14 major weirs along the main stem of the Barwon-Darling system, only the Brewarrina Weir contains an effective fishway. Using held environmental water to drown-out weirs without fishways to provide fish passage is not practicable. More: <http://www.fishingworld.com.au/news/it-s-a-first-for-our-thirsty-fish> or read the updates: <http://www.environment.gov.au/water/cewo/northern-rivers>; or contact [Anthony Townsend](#), Senior Fisheries Manager (Fisheries Environmental Flow - North), NSW DPI.

INTERNATIONAL NEWS

NZ gets more fish-friendly

New Zealand now has national fish passage guidelines, which cover the planning, design, construction, management and monitoring of structures up to 4 metres high in waterways. New Zealand has 77 species of freshwater fish, 57 of which are indigenous and most of these are endemic. However, 72 per cent of these indigenous freshwater fish species are threatened with or at risk of extinction or even extinct. This is a higher proportion than almost any other country in the world. Some freshwater fish need to be able to move freely between lakes, rivers, streams and the ocean to breed but often can't because of barriers to fish passage. Read more: <http://www.scoop.co.nz/stories/PA1804/S00209/fish-friendly-guidelines-landed.htm>.

Human-sized kings a catch of the past

Chinook Salmon are also known as 'kings' and 100 years ago fishers caught fish as large as themselves and weighing 100 pounds (about 45kg). Salmon have been shrinking in numbers and in size for a long time: dam-building, overfishing, habitat loss and replacement by hatchery fish have cut the size of the average Chinook in half. Chinooks have been shrinking even faster in the past 15 years, and older and bigger fish are mostly gone. The two principal predators of adult Chinook are humans and Orcas. However, Orcas have been harvesting Chinook for as long as both have existed. A more recent factor is the depletion of the gene pool of wild Chinook through overfishing, habitat loss and hatcheries. This has resulted in smaller fish, which lay fewer eggs than bigger fish and which also have a harder time digging out gravel nests deep enough to protect their eggs from scouring stream flows. Read more: <http://www.ideastream.org/news/this-is-why-you-dont-see-people-sized-salmon-anymore>.



A photo taken in Astoria, Oregon, USA, circa 1910. It was stated that the chinook on the left weighed 116 pounds and the one on the right weighed 121 pounds. Photo: <http://www.ideastream.org>

It tastes nasty but it's a treat for water quality

Oysters and mussels are now recognised as an exceptional tool to reduce nutrient load along coastlines and in estuaries. However, eating shellfish in highly urbanised waterways can be a risky option. The Ribbed Mussel provides a habitat rehabilitation option that is both effective at cleaning water and at little risk of being harvested – because it tastes nasty. Research using Ribbed Mussel on a suspended raft in the Bronx River Estuary, New York, USA, found the raft cleared over 100 litres of Bronx River Estuary water daily, removing 160 kg of particulate matter from the water column. At harvest, 62.6 kg of nitrogen would be sequestered in mussel tissue and shell. Read more of this work by Galimany and others in Environmental Science and Technology: <https://doi.org/10.1021/acs.est.7b02838> or a summary: <https://www.economist.com/science-and-technology/2017/12/07/a-nasty-tasting-shellfish-could-be-just-the-job-for-cleaning-rivers>.



Ribbed Mussel – a habitat hard-worker in no danger of being removed for a feed. Photo: www.economist.com

One angler's take on "true things about weirs"

Using the River Dove, in England, as a case study, this essay is an angler's reflection on weirs and fish and fishing. Fish in the River Dove were being affected by compaction of spawning gravels in impounded reaches and a cut-off of downstream supply of spawning material, the reduction in habitat structural diversity with increased predation in the simple, uniformly-slow water habitat of the weir pools, and reduced potential for juvenile salmon to migrate downstream. The rehabilitation work has included natural generation of adult Trout habitat to avoid creating population bottlenecks. Installing stable woody material is increasing the structurally diverse habitat for both adult and juvenile fish and ensuring the presence of submerged "brash" cover is helping juvenile fish survive their first perilous year of life. Read more: <http://urbantrout.blogspot.com.au/2018/02/why-presume-to-remove-weirs-with-river.html>.



Arrows indicate spawning "redds" (the nests cut into the gravel by female trout) in a previously impounded section of river upstream of a weir. Photo: urbantrout.blogspot.com.au

Play river trash robot!

Urban Rivers has developed a robot that collects rubbish from the Chicago River, USA. The floating pollution in the river was impacting efforts to rebuild habitat and removing it was both difficult and taking a lot of volunteers' time. So, a robot was designed to do the job. It connects to the internet allowing it to be controlled from anywhere in the world and by anyone who signs up to do a few minutes trash collecting. The robot has wildlife sensors to reduce the risk of doing injury and transports the collected material to a base station for removal. More: <http://www.bbc.com/news/av/technology-43572010/trash-robot-cleans-up-chicago-river-s-rubbish> or visit [Urban Rivers](http://UrbanRivers.com).



Anyone with an internet connection can drive the robot helping keep clean up the Chicago River. Photo: extracted from video at www.bbc.com.

Carp as the good guys in riparian reveg

Researchers found whole seeds occurred at a high frequency and 42 seed species in the digestive system of common carp living in the upper Illinois River, Illinois, USA. Further analysis indicated that most seeds were incidentally ingested; however, the seeds of wild celery were found at rates greater than expected by random chance. It appears common carp may fill a similar functional role of seed dispersal for aquatic plant communities in temperate large river systems as they do for fruiting plants in the Neotropics. Read more of this work by VonBank and others in the *Journal of Freshwater Ecology*: <https://doi.org/10.1080/02705060.2018.1423645>.

Fish food from forests

Researchers found that the diet of fish living in a coastal freshwater stream in a Brazilian Atlantic-coast rainforest consisted mainly of terrestrial and aquatic insects and detritus. They examined 1700 freshwater fish of 20 species from a stream within a forest area with extensive riparian vegetation. The preference for certain insects by insectivorous fishes was associated with food selectivity rather than the availability of the resource and demonstrated the strong relationship between feeding behaviour and food preference. This work confirms the role of the forest as a food provider for stream fishes. Read more of this research by da Silva Gonçalves and others *Environmental Biology of Fishes*: <https://link.springer.com/article/10.1007/s10641-018-0749-8>.

When is a waterfall not a barrier to fish passage?

In Hawaii. Freshwater streams in Hawaii are not very large, water levels can fluctuate very quickly, and, in many areas, the topography is steep. To survive and thrive here native freshwater fish have some unusual adaptations. There are only five native freshwater fish species found in Hawaii, and four of these belong to the goby family. They all spawn in freshwater, where their eggs hatch and the larvae are swept downstream to the ocean. The larvae then feed and grow in the ocean for several months before returning to freshwater, developing into adults, and reproducing. Despite this lifecycle, the fish known locally as O'opu Alamo'o are found at the highest elevations, which includes above very high waterfalls. They get above the falls by climbing, using a suction disc and 'power bursts' that allowing them to climb approximately 12 body lengths per second for a short duration. Read more: <https://habitat.fisheries.org/chasing-waterfalls-freshwater-fish-from-the-hawaiian-islands-go-to-great-lengths-to-travel-upstream/>.



O'opu Alamo'o: this species has been documented to climb Hi'ilawe Falls, Hawaii, which has a vertical drop of nearly 1000 ft (300 m). Photo: Bishops Museum.

Fish grapple with 'urban stream syndrome'

Researchers in Berlin, Germany, have looked at whether juvenile fish are using areas within highly urbanised waterways where efforts have been made to create habitat. The findings were disappointing but provide guidance for future work. 'Urban stream syndrome' refers to the combination of factors, such as stormwater runoff, wastewater drainage, and habitat loss, that challenge the health of waterways and negatively impact fish communities. The researchers found negligible differences in juvenile fish densities between wave-protected areas of riverbank habitat designed to provide refuge for juvenile fish and typical channelized bank sites. Oxygen levels and vegetation density were more important factors for fish abundance. Habitat rehabilitation project sites were more densely vegetated, where rapid aquatic plant growth reduced the flow of dissolved oxygen, thereby reducing overall fish abundance. Read more: <https://habitat.fisheries.org/small-fish-in-a-big-city-can-urban-restoration-increase-juvenile-fish-densities-in-degraded-habitats/>.

Seagrass supports fish, fishing and fishers

Researchers have argued that seagrass meadows need targeted policy to recognise and protect their role in supporting fisheries production and food security. A key part of the argument is that Seagrass meadows provide valuable nursery habitat to over a fifth of the world's largest 25 fisheries, including Walleye Pollock, the most landed species on the planet. These areas also act as a nursery habitat for important species such as Atlantic Cod, Atlantic Herring and tiger prawns and provide knock-on supportive effect to fish living in adjacent deep-water habitats by providing a source of food. In the Indo-Pacific, 746 species of fish use Seagrass meadows, 486 in Australasia, 222 in the North East Pacific, 313 in the Caribbean, and 297 in the North Atlantic. Read more of this work by Unsworth and others in *Conservation Letters*: <https://doi.org/10.1111/conl.12566> [Open access].



Seagrass supports fisheries production globally, providing food and habitat for fish important to commercial, recreational and subsistence fishers. Photo: Swansea University

Bigger is better ... for egg production

It seems taking a single big fish has a bigger impact on the fish population than taking multiple small ones. This is because plus-sized female fish invest disproportionately more in the number of eggs and the size of individual eggs. A study surveyed egg number, egg volume and energy invested in eggs by 342 different marine fish species. Rather than finding a straight linear relationship - more weight implies more egg production – the researchers found a power-function relationship: as weight goes up, the effort put into reproduction rises exponentially. This suggests that one large fish is more valuable to the population than 2 smaller females even if the total weight of the two fish is the same as that of the single, large fish. Read more of the research by Barneche and others in *Science*:

<https://doi.org/10.1126/science.aao6868> or a summary: <https://www.sciencedaily.com/releases/2018/05/180510150058.htm>.

RESOURCES

From Sea to Source: protection and restoration of fish migration in rivers worldwide V2.0

An updated resource providing guidance about how to meet the challenges that lie behind restoration of fish migration in rivers around the world. Available as a free, low-resolution PDF download or as priced hardcopy: <https://www.fromseatosource.com/?page=HOME>.

Victorian guidelines for fish passage

Under the Victorian Waterway Management Strategy four key documents have been developed relating to maintaining and improving river connectivity:

- *Guidelines for the design, approval and construction of fishways*
- *Guidelines for fish passage at small structures*
- *Monitoring the performance of fishways and fish passage works*
- *Performance, operation and maintenance guidelines for fishways and fish passage works.*

These documents are available to download in PDF and Word format here:

<https://www.ari.vic.gov.au/research/rivers-and-estuaries/fishways-and-fish-movement>.

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>.

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Website www.fishhabitatnetwork.com.au

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Partners

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

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

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

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

Ecofishers www.ecofishers.com

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

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