

Newstreams

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

Welcome to Newstreams #79 and my last as Editor. Over the last 55 issues (since February 2010) it's been my privilege to share your stories about your work to improve fish habitat with like-minded people all over the world. I've appreciated your feedback and your input, but most of all I'd like to thank you personally for the work you are all doing to make the world just that bit better for fish. Kind regards, Liz Baker.

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](#).

AUSTRALIAN NEWS

Barramundi benefitting from Palm Creek fishway

The fishway at Palm Creek weir near Ingham in Northern Queensland was constructed in December 2019 and is allowing fish to access habitat that had been inaccessible for more than 60 years. Recent monitoring has recorded sixteen fish species using the fishway, including Barramundi, Tarpon, Spangled Perch, Bony Bream and Eel-tailed Catfish. During periods of high flow this creek connects to the Herbert River so the fishway is assisting fish species that undertake seasonal migrations, such as Barramundi, to feed and reproduce. More:

<https://ozfish.org.au/2022/02/barra-benefiting-palm-creek-fishway-monitoring-efforts/>.



The Palm Creek weir fishway is enabling fish to take advantage of seasonal flows and migrate to spawning and feeding habitat. Photo: OzFish Unlimited.

Saltwater history – NSW Oysters

NSW has lost most of the oyster reefs that were once prevalent along the coast, bays and estuaries. These reefs were critical fish habitat and also supported local communities. There are now several large projects underway to restore shellfish reefs in those areas where they were once abundant. For an overview of the history of oysters in NSW, based on historical evidence, oral histories and science, and the recent efforts to restore these vital ecosystems: https://www.marine.nsw.gov.au/knowledge-centre/newsroom/news/sydneys-forgotten-oyster-reefs?follow_link=true or watch a presentation: <https://www.youtube.com/watch?v=2sOu9YthMJl> [Go to 3:35mins]. For a collection of early accounts of oystering in and around Sydney's Pittwater: <https://www.pittwateronlinenews.com/oysteringinthepittwaterestuary-oysterpearlkings.php>.

Maccas in the Georges River

For the first time in many years there is evidence Macquarie Perch are present in the Georges River near Sydney in NSW. Traces of Macquarie perch DNA have been found in water samples collected from various locations along the river. This fish requires a very specific habitat - fast-flowing, rocky water with shady trees and bushes along the banks. This habitat can be found in the Georges and importantly, there are no Redfin Perch here. More: <https://finterest.com.au/maccas-in-the-georges-river-found-using-edna>.



The Upper Georges River has areas of ideal Macquarie Perch habitat and there is evidence that these fish are present in this river. Photo: Georges Riverkeeper.

Provide the structure and they will come

ROBs are Robust Oyster Baskets and 1,450 of these were deployed into the Moreton Bay shellfish reef restoration site during the summer spawning season. The ROBs are made from mild steel mesh filled with recycled oyster shells. Researchers lifted several ROBs after 2 months and found thousands of oyster spat had settled on the structures. Other sea life was also already using the structures. More: <https://ozfish.org.au/2022/03/moreton-bay-coup-as-restoration-takes-hold/>.

‘Gap year’ benefits for Barramundi

More than a third of adult Barramundi spend their ‘teenage’ years in fresh water, and those that do so grow significantly faster and larger than those that spend their whole lives in salt water. Researchers analysed otoliths and found 33% of Barramundi caught in the Townsville and Burdekin marine fishery in Queensland had spent at least one year in fresh water as juveniles. These fish were born in salt water, then made their way upstream to freshwater lagoons during wet seasons. The researchers found that the biggest benefit to the wild Barramundi population comes from juvenile fish getting access to healthy freshwater habitats. More: <https://www.daf.qld.gov.au/news-media/media-centre/agriculture/departamental-news/barramundi-benefit-from-gap-year-in-fresh-water>.

Fish adapt to dredged habitat

The structurally diverse habitat found in natural estuaries supports diverse communities of fish species. Researchers have found that dredging an estuary repeatedly significantly altered the terrain of the estuaries, creating areas that were deeper and had steeper sides. Dredging also changed how fish utilised the estuary. In both natural and dredged estuaries, fish diversity and abundance were strongly linked to variation in seafloor depth, curvature, roughness and slope. In a natural estuary fish species abundance and diversity were linked to habitat features with lower roughness and steeper slopes, but linked to higher roughness and gentler slopes in dredged estuaries. The three most abundant species in natural estuaries were Yellowfin Bream, Estuary Perchlet, and Sea Mullet; in dredged estuaries they were Yellowfin Bream, Southern Herring, and Estuary Perchlet. More on this research by Borland and others in *Landscape Ecology*: <https://link.springer.com/article/10.1007/s10980-021-01394-5> [Open Access].

The good and the bad of floods for fish

Rain and run-off can benefit fish, providing food and flows to support migration. Too much rain, however, can lead to flooding. Flooding can also provide benefits for fish, but the changes made to catchments and floodplains mean that flooding can also destroy habitat and create conditions that have a negative effect on fish. The late Summer – early Autumn events in Southeast Queensland and Northern NSW provide a storyline that has been used to outline what floods mean for fish – the good and the bad. Long-term benefits of floods for fish include the formation of pools and deeper channels, and the positioning of large woody material to provide shelter. Flooding can also reconnect waterways and create seasonally important connections between channels and floodplains. The most obvious negative effects are the inflow of nutrients, pollutants and silt, and deoxygenation of the water, all of which are more of a problem where land management practices have exposed soil, reduced water infiltration, enabled erosion and reduced vegetative cover. The extent, duration and timing of the flooding also contribute to whether it will have a negative impact for fish. Flooding can also allow invasive fish species to travel between impoundments and waterways. The negative impacts of floods on fish can be reduced with improved land and water management. More: <https://ozfish.org.au/2022/03/we-are-in-flood-but-what-does-this-mean-for-the-fish/>.



Understanding the effects of a flood is important for understanding the issues that impact our fish as the ecological effects of floods are poorly understood. Photo: OzFish Unlimited.

Cooked mangroves not reviving

Mangroves burning during bushfires is not a new phenomenon, however for the mangroves along the Clyde River near Bateman's Bay in southern NSW the impact of the Black Summer fires was to scald and cook them with radiant heat. Some of the mangroves killed during the fire were upwards of 300 years old. What is unusual is that these mangroves are not recovering, and so efforts are underway to start replanting mangroves. Local oyster growers have got involved by gathering seedlings that are caught up in oyster farming infrastructure, and caring for them in a nursery before replanting them at the burnt sites. More: <https://www.abc.net.au/news/2022-05-02/mangroves-killed-black-summer-bushfire-batemans-bay/101023676>.

Private water donations boosting King River habitat

Landholders along the King River in north-east Victoria have more than doubled the river's environmental water allocation from the usual 50ML to 142ML. One private landholder donated 50ML of water entitlements for environmental flows. The donated water was added to an existing water flow entitlement in order to give the river and its fish greater benefits. More: <https://www.abc.net.au/news/rural/2022-03-23/riverside-landholders-donate-water-entitlements/100930526>.

From bone dry to a flourishing wetland

A vast area of grassy plains east of Broome in the Kimberley region of Western Australia has been transformed into a wetland by monsoonal rains. Fish, including Barramundi, and other aquatic animals such as estuarine crocodiles are taking advantage of the water where cattle usually graze. This area known as Gumaranganyja, or the Roebuck Plains, only floods every few years and for now the wetland and the waterholes are full. Vast amounts of food and nutrients are also coming off the plains into Roebuck Bay, providing a flush of food for fish in the estuary. More: <https://www.abc.net.au/news/2022-03-18/grassy-plains-kimberley-transformed-monsoonal-rain/100918248>.



The flood-induced transformation of Gumaranganyja into a wetland is providing a flush of nutrient and food into Roebuck Bay. Photo: ABC Kimberley: Ben Collins.

Cleaning up for fish ... the Coorong

Over 45 bags and 6 cubic meters of rubbish were removed from one beach in the Coorong in South Australia. The litter included plastic, ropes, nets, polystyrene eskies, buoys, bait-pots, and several large rusty gazebos. All of the litter collected was sorted, counted, and will be entered into the Australian Marine Debris Database which is used by researchers to determine the best way to combat marine litter. More: <https://ozfish.org.au/2022/04/volunteer-4wders-clean-up-the-coorong/>.



Piles of rubbish and litter are an all-too-familiar sight when cleaning up waterways and beaches. Photo: OzFish Unlimited.

... Tunuba

Tunuba, also known as the Fitzroy River, in Northern Queensland had 628kg of rubbish removed. As well as plastic, the rubbish included a shopping trolley, innerspring mattress, an LPG gas tank, a headboard from a bedroom, star pickets, part of a car door, and some guttering. The rubbish was sorted to separate recyclable material and plastics from non-recyclables. More: <https://www.fba.org.au/tunuba-fitzroy-river-rubbish-reduced-by-628kg/>.

... Port Phillip Bay

Port Phillip Bay was one of six sites where volunteers cleaned up beaches. The 307.8 kg of litter that was removed consisted of 8850 pieces, 70% of which was plastic. More: <https://conservationvolunteers.com.au/national-day-of-action-2022-wrap-up/>.

... Brusselton

In less than two hours, a group of divers pulled out more than 100 kilograms of rubbish and debris from under the 1.8-kilometre timber jetty at Busselton in Western Australia. The haul included some pottery, a large pole with an octopus hiding in it, and lots of fishing gear as well as lots of plastic bottles and bags. More: <https://www.abc.net.au/news/2022-03-08/volunteer-divers-pull-out-rubbish-and-debris-at-busselton-jetty/100887032>.



Divers collected rubbish from under the Brusselton Jetty, the longest timber jetty in the Southern Hemisphere, Photo: supplied to www.abc.net.au.

Fish respond to stream restoration in a ranching landscape

Crystal Creek and Black Slough were two degraded and incised streams in ranch country in central Idaho, USA. The restoration of 5.2 km of Black Slough and 8.4 km of Crystal Creek involved raising the streambeds, reintroducing gravel and reconnecting them to the floodplain, while also creating off-channel oxbow ponds and wetlands. As a result, average groundwater levels increased, flows increased, residual pool depths increased, spawning substrate sizes increased, and egg-to-fry Trout survival rates increased from less than 20% to more than 90%. Six years after restoration, fish diversity has increased from three to seven species, and the number of Brown Trout and Rainbow Trout have increased dramatically in both restored streams based on natural recruitment. More on this research by Pierce and others in *Ecosphere*: <https://doi.org/10.1002/ecs2.3986> [Open Access].

Reintroducing Dace into a restored Santa Cruz River

In 1913, irrigation diversions and groundwater pumping caused the once-perennial Santa Cruz River to run dry through Tucson in Arizona, USA. Treated wastewater is being used to restore this river and its fish habitat. The restoration is now at a point where one of the fish species – Longfin Dace - has been able to be reintroduced. Another small fish, the Gila Topminnow, was reintroduced into the Santa Cruz in October of 2020 and is doing quite well along the re-watered river, with the transplanted population of around 500 growing to roughly 2,000 fish. More: https://tucson.com/news/science/environment/native-fish-comes-home-to-tucson-as-part-of-river-restoration/article_c2904ec4-aa29-11ec-8603-fb17b0cdd83e.html.



The reintroduction of Longfin Dace into a restored river where flows are sustained with treated wastewater. Photo: Mamta Popat.

North American Freshwater Migratory Fish Database

Researchers have developed the North American Freshwater Migratory Fish Database to synthesize current knowledge of migratory status, pattern and behaviour of native and non-native freshwater fish throughout North America, including Canada, the United States and Mexico. In compiling the data for a list of 1250 species of freshwater fish, the researchers found that at least 25% of North American freshwater fishes are migratory, 23% are non-migratory and 44% have undetermined migratory status. More of this work by Dean and others in *Journal of Biogeography*: <https://doi.org/10.1111/jbi.14367>.

70,000 more seagrass seed bags in place

Around 70,000 seed bags spanning 3.5 hectares of seabed have been planted as part of the seagrass restoration project in Plymouth Sound in England. About 10,000 seagrass seed bags are used for each half-hectare. Methods of planting seedlings directly into the seabed using 'pillows' with several seedlings are also being trialled. More: <https://www.gov.uk/government/news/englands-largest-ever-seagrass-planting-hits-new-milestone-2>.

Smart Wetlands to battle the Dead Zone

So-called 'Smart Wetlands' are being trialled to combat the Gulf of Mexico's dead zone, an area of oxygen-depleted (hypoxic) water covering more than 5,000 square miles at the Mississippi River Delta in the USA. Hypoxia occurs after rain runoff carries phosphorus and nitrates into the Gulf from the Mississippi River. This dead zone threatens to deplete valuable fisheries in the Gulf. Wetlands are one of the most effective ways to filter water and reduce the nutrient runoff that contributes to hypoxic conditions developing. The Smart Wetland concept involves creating precision-sized marshes directly at the source of nutrient runoff. A trial four-acre Smart Wetland successfully treated runoff from 40 acres of the surrounding farm. Monitoring showed that between 2016 and 2019, the small site removed more than 7,200 pounds of nitrates, or up to 46 pounds per acre of drainage area, per year. More: <https://www.ducks.org/conservation/glar/illinois/smart-wetlands-to-combat-gulfs-hypoxia-threats?poe=home>.



The trial Smart Wetland demonstrated how effective wetlands can be at removing nutrient from run-off before it enters waterways and impacts fish habitat. Photo: Bureau County Soil & Water Conservation District.

Some fish like living on the edge

Across the world, shellfish reefs are being restored. Researchers studying a restored oyster reef found that there is more to how fish use the restored habitat than just the fact that there were more fish around the reef than were found on nearby unstructured sandy habitat. They found that the species that made up the fish community and the biomass also differed between the edge and interior of individual reefs because of species-specific patterns of use. These patterns were only weakly linked to oyster density, suggesting that other factors that vary between reef-edge and reef-interior, such as predator access or interspecies interactions, are likely more important for community structure on oyster reefs. Read more of this research by Davenport and others in *Restoration Ecology* : <https://doi.org/10.1111/rec.13693>.

Any habitat work helps Brown Trout and Atlantic Salmon

An analysis of the impact of habitat restoration projects on Brown Trout and Atlantic Salmon has found that both these species responded positively to habitat restoration regardless of the specific restoration action. These included the addition of spawning gravel, installation of in-stream structure, channel restoration, barrier removal, nutrient restoration and liming. The analysis suggests both small-scale and large-scale salmonid habitat restoration is effective. For example, effects of small-scale restoration such as gravel bed addition were not significantly different from the effects of larger-scale restoration efforts, such as dam removal. What did affect the response of these fish species was stocking. In rivers without stocking, salmonid populations significantly increased in response to the habitat restoration. However, where stocking was carried out, salmonid populations did not respond to habitat restoration. Read more of this graduate research by Elizabeth Thomas: <https://www.wildtrout.org/wttblog/is-habitat-restoration-effective-for-brown-trout-and-atlantic-salmon-populations>.



Salmonids respond positively to habitat restoration but not if stocking also occurs. Photo: Wild Trout Trust.

The welcome sound of jackhammers in the river

The sound of a hydraulic hammer pounding away at a 200-year-old dam in Norwood in Massachusetts USA was a welcome one for fish of the Traphole Brook. The stream is home to the largest number of native Brook Trout in the region but the dam has severed their population in two. The populations have been isolated for years. Traphole Brook is one of the last remaining good cold-water streams with robust populations of trout.

More:

<https://www.wbur.org/news/2022/03/01/dams-river-massachusetts-demolish>.



Heavy machinery made short work of removing one of over 1000 dams and weirs that impacting fish passage. Photo: Robin Lubbock/WBUR.

Fathead Catfish and more with restoration

A Fathead Catfish has been found in the Cuyahoga River at Akron in Ohio, USA, the furthest upstream from the Great Lakes that this species has been seen in living memory. To get to Akron from Lake Erie, the fish had to have taken advantage of the removal of Brecksville Dam. The presence of the Catfish is among several positive indicators of the river's return to health with the restoration of about 200 acres of former dairy farm-turned golf course. The restoration included the excavation of between six and eight feet of material over six acres to recreate more than 60 acres of floodplain, and the installation boulder clusters, which are creating scour pools. Before the restoration, monitoring recorded 226 fish per kilometre which increased to 806 fish per kilometre after the restoration. The number of species present increased from eight to twenty six after the work.

More: <https://spectrumnews1.com/oh/columbus/news/2022/04/21/summit-metro-parks-cascade-valley-restoration>.

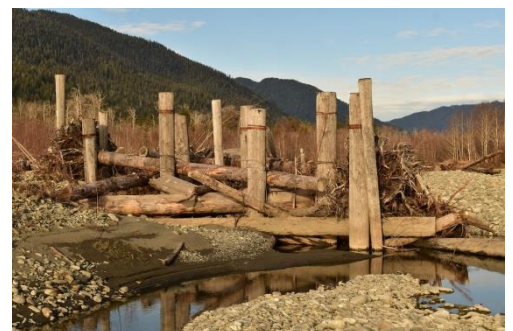


The Fathead Catfish has been found well upstream of the Great Lakes, taking advantage of a dam removal and habitat restoration. Photo: tw.americanfishingassociation.com.

Log-jamming and the 'long game' of restoring Quinault fish habitat

In the upper Quinault River in the USA's Pacific Northwest almost 50 engineered log jams have been installed during low-flow periods as part of the process to remedy the impacts of about 100 years of logging the surrounding forest. The removal of trees led to increased erosion of the riverbank and a decrease in suitable spawning habitat for Sockeye Salmon. After the log jams were installed, the water channel split around the structures and started creating multiple channels through the floodplain. The log jams are slowing the water flow, forming cooler water pools for the salmon to rest and hide in during the hot summer months, and is causing gravel to accumulate, which creates areas of substrate suitable for spawning salmon. Young trees have been planted on the substrate of stabilized log jams to encourage vegetation to grow and further stabilize the floodplain. It is hoped that mature forested islands will establish within 50 to 80 years.

More: <https://news.medill.northwestern.edu/chicago/engineered-log-jams-restore-natural-river-flow-fish-spawning-in-pacific-northwest/>.



One of the log jams installed in the Quinault River. Photo: Fiona Skeggs/MEDILL.

Gunnison River restoration project complete

The restoration of sections of the Gunnison River near the city of Gunnison in Colorado, USA, included instream habitat improvements that will enhance holding areas for trout, improve the function of the river channel and two irrigation structures, stabilize previously eroded banks and revegetate degraded riparian areas. A fish survey last year found that there was already an improvement in the fish utilizing the reach. More: https://www.montrosepress.com/free_access/partnership-completes-gunnison-river-restoration/article_19c6794e-b799-11ec-ae99-6f7198bfe0aa.html.

River restoration reducing seal predation on Salmon

Researchers have found that river restoration efforts and increasing river herring runs in the Penobscot River in Maine, USA, may be helping lessen the impacts that seals have on Atlantic Salmon. Seal-induced injuries to Salmon declined between 2012 and 2019, coinciding with an increase in river herring and overall estuary fish biomass. It appears that even though seal populations in the region are increasing, the increase in the river's forage fish, like river herring, may provide Atlantic salmon with some level of protection from seal predation. Read a summary: <https://umaine.edu/news/blog/2022/03/15/umaine-study-shows-penobscot-river-restoration-efforts-may-benefit-both-salmon-and-seals/> or access the research by Leach and others in *Aquatic Conservation: Marine and Freshwater Ecosystems*: <https://doi.org/10.1002/aqc.3783>.

'Smart Salt' to reduce impact on freshwater waterways

Winter in the northern hemisphere's urban areas include the practice of salting roadways to de-ice them and make driving safer. In the USA, 20 million metric tons of salt are used on the roads each winter. The most common kind of salt used for de-icing is sodium chloride, i.e., rock salt, but calcium and magnesium chlorides are sometimes used for colder weather. Once it enters a body of water, salt is almost impossible, and expensive, to remove. Chloride, in particular, binds tightly to water molecules, and can be highly toxic to fish and zooplankton. In Minnesota, 54 lakes and streams are designated 'impaired' by high salt concentrations. Several regions in the USA are using a 'smart salt' approach. This encompasses a range of technologies and techniques, including using brine rather than salt, timing the application, and in some areas piping waste hot water under the road. Read an overview: <https://grist.org/cities/road-salt-is-imperiling-us-waterways-states-might-have-a-solution/> or the research by Hintz and others in *Frontiers in Ecology and the Environment*: <https://doi.org/10.1002/fee.2460> [Open Access].

Fish like the regenerating Kelp beds in Sussex

A year ago, bottom-towed trawling was excluded from over 300km² of the coastline off Sussex in England. The kelp beds are starting to regenerate and the fish are returning. Over 96 per cent of kelp in Sussex had disappeared since 1987. To follow the progress of the kelp's return: <https://sussexwildlifetrust.org.uk/sussexkelp> or watch a video <https://www.youtube.com/watch?v=Tf00eZ2jqBQ> or access presentations at the Kelp Summit held later last year: <https://sussexwildlifetrust.org.uk/kelpsummit>.



Fish recorded by underwater camera positioned in the regenerating kelp beds off the Sussex coast. Photo: Sussex Wildlife Trust.

RESOURCES

Port Phillip Bay Reef Cam (Aus)

A live-stream, marine webcam located in Victoria's Port Phillip Bay at Pope's Eye. Livestream or watch a 7-day highlights: <https://www.natureaustralia.org.au/what-we-do/our-priorities/oceans/ocean-stories/reef-cam-underwater/>.

Fisher Science Tackle Box (Aus)

A collection of resources to build the capacity of recreational anglers to map, monitor, learn and educate about their local fish and waterways, and the knowledge and skills needed for participation in citizen science research: <https://ozfish.org.au/fisher-science-tackle-box/>.

Fish and Fisheries in Estuaries: A Global Perspective

A book covering major aspects of fish and fisheries in estuaries throughout the world. The text describes the biology of estuarine fish and their connections with estuarine and adjacent marine and freshwater ecosystems, as well as examining the ways human industrialization and global events such as climate change are impacting both native and non-native species: <https://doi.org/10.1002/9781119705345>.

European diadromous species distribution data 1750 – 2021

A dataset is now available on the distribution of European diadromous species (lampreys and fish) in selected catchments in Europe, the Middle East, and North Africa from 1750 to present time. The data includes information about the presences/absences and population functionality: <https://doi.org/10.1016/j.dib.2022.107821> [Open Access].

The Chalgrove Brook - Rescuing A Chalk Stream (UK)

A video story of one small Oxfordshire chalkstream heading into the Thames and the local community that's fighting for it: <https://www.youtube.com/watch?v=5rA2CWFxAG0>.

Kelp-watch (USA)

This data imaging tool, created by analyzing satellite imagery of coastal waters, enables estimates of the presence and size of kelp forests, and observe how they change over time: <https://kelpwatch.org/>.

Outreach and Education in Coastal Communities (USA)

A webinar discussing education, outreach, and community engagement to further coastal resilience and restoration in and around Chesapeake Bay, USA: <https://www.youtube.com/watch?v=ITE6T01SDDs&t=7s>.

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 [Fish Habitat Network team](#) .

Back issues can be accessed from <https://www.fishhabitatnetwork.com.au/newstreams>.

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 **Freshwater 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.



Department of
Primary Industries



Website www.fishhabitatnetwork.com.au

Facebook www.facebook.com/fishhabitatnetwork