

Newstreams

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

Welcome to Newstreams #77. As we are now emerging from lockdowns, I hope you find inspiration in the stories of people like yourselves unlocking fish habitat, building on our understanding of fish habitat, and making more fish happen naturally. 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](#)

Get involved in fish habitat! Applications close 10th December 2021

If you've got a fish habitat project in mind, have a look at the many examples of projects that have been funded through the [NSW Habitat Action Grants](#) (HAGs). The Habitat Action Grants are funded through the NSW Recreational Fishing Trusts and have provided over \$7.5M investment in 332 habitat restoration projects throughout NSW since 2008. Angling clubs, individuals, community groups, local councils and natural resource managers throughout NSW can apply for grants of up to \$40,000. Habitat rehabilitation projects that have been funded include:

- removal or modification of barriers to fish passage;
- rehabilitation of riparian land;
- re-snagging waterways with timber structures;
- removal of exotic vegetation from riverbanks and replace with native species;
- bank stabilisation works; and
- reinstatement of natural flow regimes.

For more information: [Habitat Action Grants Program](#).

Read about some funded projects – big and small – that are contributing to improved fish habitat throughout NSW here: [HAG case studies brochure \(PDF\)](#).

Funded projects now underway or recently completed include:

- Bank stabilisation projects on the Wallamba & Manning Rivers using reclaimed oyster shells from Wallis Lake and engineered rock filllets: [more](#).
- Re-snagging along the Tarcutta Creek: [more](#).
- Replanting the banks of the Lachlan River at Forbes: [more](#).



AUSTRALIAN NEWS

The only way is up – Richmond River working on its D minus rating

In 2015, the Richmond River in north-eastern NSW had a D minus health rating. The works to improve the state of the river since then include the restoration of 38km of riparian habitat, preventing 2,800 tonnes of run-off through sealing dirt roads, stabilising banks and controlling erosion, and installing 100 log fillets in positions that both provide fish habitat and minimise the impact of the wake from boats on the banks. Already locals are reporting seeing more fish and the beginnings of mangrove habitat returning. More: <https://www.abc.net.au/news/rural/2021-09-18/plan-to-improve-water-quality-richmond-river/100466282>.



Log fillets protect a newly formed mangrove nursery from boat wave wash. Photo: North Coast Local Land Services.

Glenelg's new shellfish reef doubled in size

The final stages to expand the native shellfish reef off the coast of Glenelg in South Australia from two-hectares to five-hectares are now complete. By boosting water quality and improving fish habitat, shellfish reefs can have a major impact in areas like Glenelg where fishing is a major employer and economic contributor. Limestone rocks sourced from a local quarry and more than two million hatchery-raised Australian Flat Oyster spats used to complete the reef. More: <https://minister.awe.gov.au/ey/media-releases/reef-twice-big-adelaide-oval-now-complete>.

'Shellfish Revolution' underway at Port of Brisbane

Using the success of the One Billion Oyster project in New York Harbour in the USA as a model and billed as the 'shellfish revolution,' volunteers have now started work on the 19.4 hectares of shellfish reef restoration at the Port of Brisbane in Queensland's Moreton Bay. More than 50,000 so-called 'Robust Oyster Baskets' will have to be built by hand then filled with recycled oyster shells which have been collected and sterilised. These structures are used as the base for baby oysters to grow on. The project is a follow-on from the trial further north in Pumicestone that is now delivering dividends for fish productivity, including 16 times more harvestable fish abundance and four times more fish diversity at the reef site. More: <http://www.fishingworld.com.au/news/largest-community-driven-shellfish-reef-restoration-in-australia-gets-started>.



The Robust Oyster Baskets that are the basis – literally – of the shellfish revolution. Photo: OzFish Unlimited.

Picking up the lost pieces of Seagrass

Recreational fishers are working with researchers to collect remnant pieces of the Posidonia seagrass that wash up on the shores of Lake Macquarie on the central coast of NSW. The sprigs are then used to re-bed sea floors with this important seagrass species. The seagrass beds in Lake Macquarie have declined significantly, representing a loss of fish habitat. More: <https://newsroom.unsw.edu.au/news/science-tech/doing-posedons-work-how-citizen-scientists-are-helping-restore-endangered>.

Tropical fish moving into temperate habitat zones

The Black Rabbitfish is one of the tropical fish species being found in the temperate waters off the coast of Western Australia. Researchers found that this species may be able to establish itself as a self-recruiting population far into the Great Southern Reef area, partly due to its diverse diet. It can and does feed on kelp, one of the foundation habitats of this reef and one that is under increasing pressure. The study demonstrated that projected favourable climate conditions, continued large-scale genetic connectivity between populations, and diet versatility are key for tropical range-shifting fish to establish in temperate ecosystems. More of this research by Gajdzik and others in *Communications Biology*: <https://www.nature.com/articles/s42003-021-02733-7> [Open Access].

Fewer Carp and more habitat helping fish in the Ovens River

Since 2015, 16.95 tonnes of Carp have been removed from the rivers, wetlands and private dams around the Victorian town of Wangaratta, including from the Lower Ovens River. The Lower Ovens River floodplain is recognised as a nationally important wetland complex containing 1800 individual wetlands, supporting an abundance of fish species. Removing Carp assists native fish to get a foothold back into their natural habitat and healthy populations of native fish can help reduce Carp numbers through competition and predation. The fish habitat in the Lower Ovens River has also been improved with re-snagging, removing fish barriers, and restoring riparian areas. The Carp removed during the electrofishing surveys is transported to a factory and converted into fertiliser. More: <https://www.necma.vic.gov.au/News-Events/News/ArtMID/431/ArticleID/1653/Supporting-native-species-by-managing-carp-in-local-waterways>.

Mustering mussels for the Peel

Progress is being made on restoring shellfish habitat in Western Australia's Peel-Harvey Estuary with about 220 kilograms of locally grown Mussels loaded onto a barge at Wannanup jetty before being placed onto specially developed mussel beds in the estuary. These first trial beds in the estuary will be used to explore mussel growth and survival in specially selected locations ahead of pilot shellfish reefs planned for construction in the estuary in the first half of next year. Locals grew the Mussels from juveniles to adults in specially designed baskets over the last year, while also collecting important data about mussel growth and survival and other colonising marine life. More: <https://www.natureaustralia.org.au/newsroom/peel-community-mussel-220kg-shellfish/>.



One of the 'shellfish gardeners' with some of the Mussels ready to be deployed into the estuary. Photo: Nature Conservancy Australia.

Critical reflections on the assessment and management of fish kill events

A study of catastrophic fish kill events in the Murray-Darling Basin argues there is a need for a philosophical change in the approach to assessing and managing such events. As well as the death of sometimes thousands of fish, fish kills also include a loss of biological, social and cultural assets. 15 Key recommendations were identified from this paper. Most notably it was recognised that improvements are needed regarding the assessment and evaluation of the loss of fish and other aquatic life, and how the community, cultural and recreational values are recognised and included. Read more of this work by Koehn in *Marine and Freshwater Research*: <https://www.publish.csiro.au/mf/Fulltext/MF20375> [Open Access].

INTERNATIONAL NEWS

Wild Trout are back in Lake Erie

Recently hatched Lake Trout fry have been identified from a rock reef west of Lake Erie's Barcelona Harbor in New York State, USA. Decades of work and investment in improving water quality and fish habitat has been needed to get this far after the once plentiful population of Lake Trout collapsed due to overfishing, habitat degradation and invasive species. Lake Trout were once the top predator in Lake Erie with records of fish weighing 75 pounds. Commercial fishing for Lake Trout in the Lake began in the late 1700s, and the population had significantly declined by the late 1800s and was considered extinct by 1965. Restocking and habitat improvement efforts maintained a fish population, however the evidence that Lake Trout are spawning, and their eggs are surviving and hatching successfully is significant. More: https://www.thelcn.com/news/local/environmental-restoration-wild-lake-trout-confirmed-in-lake-erie/article_d6b3f940-34db-5a82-b1a7-1c64c0b0582e.html.

Cleaning up Papahānaumokuākea

A team of divers has spent 30 days removing marine debris from the shallow reefs and shorelines of the Papahānaumokuākea Marine National Monument, which encompasses 583,000 square miles (1,509,963 km²) of ocean waters, including ten islands and atolls of the Northwestern Hawaiian Islands. These remote islands and atolls are centred among Pacific currents that carry lost and abandoned fishing nets and gear from all over the Pacific Ocean. The debris entangles wildlife and damages corals. In only 18 days, they collected nearly 124,000 pounds (56,245 kg) of debris, which included many abandoned fishing nets and nearly 5,300 pounds (2,404 kg) of plastics and other debris. More: <https://www.fisheries.noaa.gov/feature-story/success-2021-mission-clean-marine-debris>.



The clean-up team and some of the nets that were removed from the remote reefs. Photo: NOAA Fisheries/James Morioka.

Sturgeon getting a lift in the Menominee River

In order to access good spawning and juvenile habitat in the Menominee River on the Wisconsin – Michigan border in the USA, the long-lived Lake Sturgeon are required to use a so-called fish elevator to bypass two dams. The process is an involved one, involving a metal hopper lowered to the bottom of the river, an artificial flow to encourage fish entry, a 30-foot lift to a sorting tank, inspection and tagging of Sturgeon – and an ultrasound of fish likely to be ready to spawn, transfer to another tank, then road transport to a boat ramp where the fish can finally continue their upstream migration to spawn. Downstream migration is a simpler matter: Lake Sturgeon pass through dams via open gates or use fish-bypass structures specifically built for this species at each dam. More: <https://www.upnorthvoice.com/outdoors/2021/09/giving-lake-sturgeon-a-lift/>.



Several lake sturgeon in the hold of a trailer, prior to their release into the Menominee River. Photo: Michigan Department of Natural Resources.

The State of the Thames Report

Stretches of the Thames River in England were declared 'biologically dead' in 1957 however the tidal stretch has made a significant recovery. The latest State of the Thames Report documents an increase in its range of birds, marine mammals and natural habitats since the 1990s, however, a number of fish species found in the tidal areas of the Thames have showed a slight decline. Sharks, including Tope, Starry Smooth Hound and Spurdog, and more than 100 species of fish in the 215-mile-long river. There have been significant long-term improvements in water quality, largely due to updated sewage treatment works. For an overview: <https://www.bbc.com/news/uk-england-london-59222372> or the full report: https://www.zsl.org/sites/default/files/ZSL_TheStateoftheThamesReport_Nov2021.pdf.

Restoration increases Brown Trout but not Brook Trout

Conway Creek in Wisconsin, USA, is a cold-water stream with very high water quality but severe streambank and in-stream habitat loss after flooding events. Restoration works have stabilised and enhanced fish habitat within this creek using rock riprap, revegetation with cold-season grasses, and bank re-shaping. Logs and boulders were installed in-stream to create permanent deep pools, overhead cover and resting places for fish. A substantial increase in Brown Trout numbers was recorded after the habitat restoration work, from 678 to 3,408 Brown Trout per mile, however the numbers of Brook Trout declined. Work is ongoing to identify the habitat work that would benefit Brook Trout specifically. More: <https://www.swnews4u.com/local/environment/work-completed-conway-creek-streambank-restoration/>.

900 years later and fish can move along the River Dove

The removal of Dovecliffe weir, on the Derbyshire/Staffordshire border in England, allows the free passage of fish along the River Dove and its tributaries for the first time in almost 900 years. The weir dated back to the 1200s, but no longer served a functional purpose. Removal of the weir has opened more than 550km of waterways for fish and will also improve the habitat for fish to spawn and grow as it creates a more natural river environment. More: <https://www.bbc.com/news/uk-england-derbyshire-58915696>.

River Keekle projects wins the UK River's Prize

The River Keekle, near Whitehaven in West Cumbria, England, was heavily modified until the 1990s due to nearby coal mining. After mine spoil was buried across the site the river was lined with an HDPE plastic liner. This liner was failing and heavily degraded. The project to remove 180-ton plastic liner from 2.5km of the River Keekle and restore the riverbed with natural stones and gravels has transformed the local environment. The river is re-naturalising and should create habitat for fish spawning. More: <https://www.westcumbriarivertrust.org/news/river-keekle-restoration-scoops-prestigious-national-award>.



The remediation of a major habitat degradation problem in the River Keekle has won the UK River's Prize for 2021. Photo: West Cumbria Rivers Trust.

Once were Snapper nurseries

A study has identified that Snapper in the Hauraki Gulf, New Zealand, have lost what were once critical nursery areas. Snapper otoliths from two Māori middens were carbon-dated to the 16th and 15th centuries respectively and were used to build a chemical profile that enabled the researchers to recreate snapper movement through the gulf's prehistoric riverine, estuarine, and marine environments. The analysis found that 600 years ago the gulf was a pristine environment with plenty of freshwater rivers emptying into it, creating vast nearshore brackish environments. Snapper used to spend a year in these nearshore nursery areas, all coming in synchronously after hatching and enjoying the protection of nursery environments before venturing back to the sea as young adults. Modern Snapper are not doing this. Not only are some of them are refusing to come into nearshore areas after hatching, those that do come are chaotically going back and forth between nursery and adult habitats. It appears the loss of nearshore nursery habitats, such as seagrass meadows, and the decline in estuary health associated with modern land-use changes have contributed to this change. Read a summary: <https://www.nzherald.co.nz/nz/ancient-insights-how-the-gulfs-snapper-lost-crucial-nurseries/2FXDG5MCNA33AR5OEKFF5EWI6U/> or the research by Sabetian and others in *Ecological Indicators*: <https://doi.org/10.1016/j.ecolind.2021.108225> [Open Access].



The bones of Snapper caught long ago can be used to understand changes in habitat use and availability. Photo: Museum Victoria. License_ CC BY Attribution.

Trout spawning following rehabilitation work

Black Beck was an important spawning tributary of the River Eden in the Cumberland region of England. Recent habitat rehabilitation works have recreated the meanders and bends that would have existed prior to the beck being straightened. The meanders have allowed the natural channel of the beck to form again and in-stream features, such as natural bed material, have provided essential habitat for fish and insects to thrive. Trout have now been found to be spawning in Black Beck again. More: <https://www.newsandstar.co.uk/news/19667795.wildlife-thrive-vital-improvements-made-black-beck/>.



Trout responded quickly to the recreation of the natural conditions of Black Beck. Photo: newsandstar.co.uk.

Maintaining the flow good for fish with minor impact on power generation

Researchers studied the impact of minimising zero-flows on fish in the Ume River system in northern Sweden which has 19 major hydropower stations. In a normal year, the hydropower stations are still, with no discharge, up to 55% of the time. This changes the river from running water habitat to stagnant water. These zero-flow events affect the behaviour of fish and alter the fish community. The introduction of minimum flows for the entire Ume River catchment would result in an additional 240ha of shallow running water habitat resulting in gravel streambeds having flows suitable for fish species such as Grayling. With this maintenance of flow, structural rehabilitation of reaches within the river system would create an additional 107ha of similar fish habitat. It is estimated these measures would result in a mean loss of hydropower production of 0.5% per year for the entire river system. Read more of this work by Widén and others in *Science of The Total Environment*: <https://doi.org/10.1016/j.scitotenv.2021.147010>.

RESOURCES

***Posidonia australis* school resource (Aus)**

An activity-based booklet for school-aged children in Years 5 and 6, including teacher support information: <https://www.dpi.nsw.gov.au/fishing/threatened-species/school-resources>.

Illustrated map of Murray Cod and Golden Perch journeys in the Darling-Baaka River (Aus)

An interpretative map, with key elements highlighted relating to habitat use and migration for the two species: <https://finterest.com.au/a-stunning-illustrated-map-of-murray-cod-and-golden-perch-journeys-for-you-to-explore/>.

The Economic Value of America's Estuaries: 2021 Update (USA)

The 2021 Update includes 6 detailed case studies: <https://estuaries.org/wp-content/uploads/2021/11/2021-Report.pdf>.

New story map: *Reopening Rivers to Migratory Fish in the Northeast (USA)*

This storymap highlights the many benefits that opening rivers and streams to fish passage provides: <https://storymaps.arcgis.com/stories/c7dfb5ea18da4c7db9eb77848b827b6f>.

State of the World's Mangroves 2021

This report presents the latest information about mangroves and what is being done to support these habitats: <https://www.mangrovealliance.org/mangrove-forests/>.

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 <https://www.fishhabitatnetwork.com.au/newstreams>.

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