#53, December 2015

Newstreams

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

AUSTRALIAN NEWS

Native Fish Forum brings scientists and fishers together

After an absence of several years, the return of the Murray-Darling Basin Native Fish Forum was welcomed by fishers and scientists alike. Talks that were particularly well received covered topics such as how to better manage water flows for native fish by taking into account impacts of floodplain inundation and the maintenance of hydrodynamic complexity; screening technology for irrigation pumps; the economic value of riparian vegetation to farms and the value to fish; and the potential release of the Koi Herpes virus for carp control. Abstracts of the program and the broader Aust. Society of Fish Biology conference are available at : http://asfbconf.asnevents.com.au/

International forum focus on MDB fish habitat

A session of the 2015 American Fisheries Society Conference was dedicated to the topic: 'Rehabilitating Native Fish Populations in Australia's Murray-Darling Basin: Integrating Research, Management and Community Advocacy'. Speakers talked about flows and connectivity; how irrigators can lead the recovery of native fish; and the integration of science, management and community participation to ensure there is a future for native fish habitat rehabilitation. The program and abstracts, with author contact details, can be accessed at: https://afs.confex.com/afs/2015/webprogram/Session3486.html

The fish of Sydney Harbour

Nearly 600 fish species have been recorded in Sydney Harbour and this level of fish diversity is high relative to other major estuaries worldwide. However, less is known about how the Harbour ecosystem works. Two recent studies identified that while human impacts have changed the ecology of the harbour significantly, much less is known about the implications of these changes for fish. To read more about these studies in *Marine and Freshwater Research*: http://www.publish.csiro.au/paper/MF15159.htm and http://www.publish.csiro.au/paper/MF15157.htm

The Banded Sea Perch: one of the fish species found in Sydney Harbour. To see more photos like this one and explore specific areas, visit www.underwatersydney.org.

Rehabilitation at Sydney Olympic Park

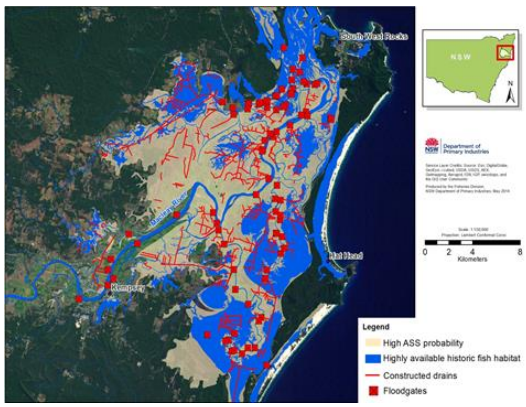
Twelve years on, the efforts to restore the industrial area of Homebush Bay, Sydney, are providing improved fish habitat. While primarily an urban renewal and recreational area, there are 25 hectares of remnant coastal saltmarsh and 73 ha of mangrove forest on the site. Management of estuarine communities has focussed on weed invasion, mangrove colonisation and tidal flushing. Restoration of tidal flushing has resulted in improved estuarine health and a significant expansion in the area of saltmarsh. Read more of the review by O'Meara and Darcovich in *Ecological Management and Restoration* [Open Access]: http://onlinelibrary.wiley.com/doi/10.1111/emr.12150/pdf

The drain on the plain that reduces fish pain

It still looks like a drain, but what lies beneath is good news for the fish of the Great Barrier Reef. Image: Queensland Country Life.

Ray and Rosemary Vicarioli's cane farm near Babinda, Far North Queensland, averages 4,000mm of rain a year. Managing the water that drains from farms, such as this one, via local waterways into the Great Barrier Reef is a challenge. The Vicariolis have improved the quality of the water leaving their farm by laying 24 big pipes to take most of the water flowing down a deep gully. The pipes were covered with sand, then narrow seepage pipes were laid over the top to take water from the adjacent cane fields. The channel was filled with layers of gravel, sand and dirt, which filter sediment from the water as it seeps through. The top has been planted with grass to prevent future erosion and a rocky silt trap catches any surface water that remains before the junction of the drain and the local creek. The project compliments the revegetation work the family has done along the creeks which flow through their farm. More on this story: http://www.queenslandcountrylife.com.au/story/3436738/babinda-growers-turn-drain-into-water-filter

And the drains that didn't



The extent of floodgates and drains in the Macleay floodplain, northern NSW Image: DPI Fisheries

In NSW, the decline and loss of coastal wetlands was driven by the construction of flood mitigation structures, such as floodgates and drains. A review of the extent of these structures, including analysis of historical data, has been used to quantify the loss of prime fish habitat from the large coastal floodplains. The review identified pre-European distribution of approximately 477,000 ha. of coastal wetlands. Of this 87,000 ha of this was considered prime fish habitat and 62,000 ha was impacted by the flood mitigation works that continued into the 1970s. This means a loss of 72 percent of prime fish habitat from the coastal floodplains of northern NSW. Read more of this work by Rogers and others in *Regional Environmental Change*: http://link.springer.com/article/10.1007/s10113-015-0872-4

Saving seagrass worth it for the carbon

Damage to seagrass: not good for the seagrass, for fish or for carbon management. Photo: SeagrassWatch.org

Seagrass meadows are able to sequester carbon at a rate 35 times faster than tropical rainforests, but the relative impact of disturbing seagrass was not known. Researchers have found that disturbing seagrasses in coastal environments can release ancient carbon and reduce the capacity of seagrass meadows to capture carbon and store it. For example, in the 1960s the creation of holes up to 30 metres wide in the meadows in Jervis Bay, New South Wales, destroyed large areas of seagrass and it has not yet regrown. Soil carbon which had accumulated over hundreds to thousands of years declined by 72 per cent as a result. However, the research also showed that seagrass areas that had recovered were once again capturing and storing carbon. For more on this research by Macreadie and others in *Proceedings of the Royal Society B*: http://rspb.royalsocietypublishing.org/content/282/1817/20151537

More good news for Condamine fish

A series of rising rock pools has opened up 100 kilometres of the Condamine River from Cotswold to the Condabri Weir, in southern-central Queensland. The fishway on the Condamine Town Weir removes a significant barrier to fish passage and already fish are using it, with sightings of dozens of native fish resting in the pools during a flow in the river. Native species expected to benefit from the improved connectivity include the Murray Cod, Golden Perch, Eel-tailed Catfish, Carp Cudgeon and Bony Bream. For more on this story: http://www.queenslandcountrylife.com.au/story/3472883/ladder-gives-fish-a-step-up-over-condamine-weir/

The Condamine Town Weir fishway. Image: Queensland Country Life.

Watching Whiting

Recreational fishers in the Upper Spencer Gulf, South Australia, were sure that the conventional understanding that King George Whiting only spawn in deep offshore waters outside of the St Vincent and Spencer Gulfs was not quite right. They had been catching females with eggs in shallow waters in northern parts of Spencer Gulf. So the fishers took the fish frames and photographs to fisheries scientists at the South Australian Research and Development Institute. It appears the fishers have identified the most northern reproductive maturation for this species in SA's Gulfs. The information is important given that the official stock assessment for King George Whiting in the Gulfs is 'below sustainable'. For more information, contact oa@recfishsa.com.au

King George Whiting are now known to be spawning in northern Gulf areas of South Australia. Image: FishesofAustralia.net.au

Judas Carp wins award

Glenelg Hopkins CMA won an Innovation Award from the River Basin Management Society for their approach to tackling Common Carp in the Glenelg River, Victoria. The 'Judas Carp' approach involved tracking a tagged fish that then provides information about the patterns and distribution of Carp in the river. The work has identified that there are now approximately 10,000 Carp in the river, but they utilise small home ranges and congregate around complex snags and shallow reed beds in large numbers during the Autumn/Winter when water temperatures are lower. Understanding this behaviour will enable more effective capture and removal. For more on this story: http://www.ghcma.vic.gov.au/news/article/judas-carp-wins-innovation-award

First, find your snags

The first stage of the Abercrombie River resnagging project is complete: twenty five massive felled trees have just been delivered to the site. The Box Gum trees were tagged for removal by the local Council during road works, but rather than being burned they will instead become strategically placed habitat for native fish. The new snags will be installed at the junction of the Tuena Creek and the Abercrombie River, west of Crookwell, central NSW, an area where fish habitat surveys identified a low density of snags. The site is a critical drought refuge and biodiversity hotspot in the headwaters of the Lachlan River system. For more on this story: http://centraltablelands.lls.nsw.gov.au/resource-hub/media-releases/2015/trees-felled-as-snags-in-abercrombie

Queensland's saltmarsh habitats

Samphire dominated saltmarsh community south of Townsville. Source Ross Johnston (extracted from report)

Over a third of Australia's saltmarshes occur in Queensland, found from the seasonally dry areas of Cape York to the south-east's permanently wet conditions. Saltmarsh is recognised as an important habitat for fish and for the invertebrates that fish feed on. Populations of Banana Prawns, in particular, are strongly associated with estuarine wetlands, and the extent of intertidal habitat, such as saltmarsh, is a strong indicator of prawn catch. However, since European settlement around 35,000ha of saltmarsh has been lost. A study has reviewed the extent and impact of this loss, as well as the impacts of saltmarsh rehabilitation. It was found that saltmarsh vegetation returned once tidal inundation was restored. One of the report's primary recommendations is the removal of tidal levees. To access the report by Wegscheidl and others [open access]: https://research.jcu.edu.au/tropwater/publications/1554Queenslandssaltmarshhabitats.pdf

Not all flows the same for fish larvae

Changes to natural flow regimes are recognised as having a severe impact on the health of river ecosystems and fish populations. Researchers have looked at how larval fish respond to different flow conditions in the lower River Murray, in south-eastern Australia. They found that hydrology was the key factor in explaining differences in larval fish between years, however different species of fish responded differently to conditions. Small to medium bodied native species were more abundant during low-flow conditions, others responded more to temperature and the larvae of two large-bodied species were only abundant during overbank flows. To read more of this research by Cheshire and others in *River Research and Applications*: http://dx.doi.org/10.1002/rra.2946

Estuaries in transition

Restoration of the Glenelg River estuary is good for fish and for fishing, as this happy angler shows. Photo: http://travwantsakayak.blogspot.com.au/2013/04/glenelg-river-holy-grail-2013.html

Estuaries are a transition zone for fresh and saline water and key habitats for many fish species. Some estuaries are also in transition towards a healthier state. A review of estuary conservation projects in southern Australia has identified some of the factors that assist this transition. One of these is government agencies and local communities working well together. Another is aligning the social values of the estuary with ecosystem management plans. The case studies include the Glenelg estuary in Victoria, Leschenault Bay in Western Australia, seagrass ecosystems of South Australia's Gulfs, the Derwent estuary in Tasmania and NSW's 'Oyster Coast'. To read these reviews by Koss and others in *Australian Journal of Maritime and Ocean Affairs* [Open Access]: http://www.tandfonline.com/doi/pdf/10.1080/18366503.2015.1014014

INTERNATIONAL NEWS

Mullet's flexible when it comes to habitat

A study has found that the ways in which New Zealand Grey Mullet use freshwater or brackish habitats varies with climate and latitude. The Grey Mullet is known to be able to adapt to a wide salinity range, giving it access to highly productive estuaries and riverine lakes. Researchers used the otoliths (fish ear bones) to determine the habitats the fish had lived in. It was found that at the southern ends of their distribution, this species shows more flexible migratory behaviour and uses both freshwater and brackish habitats to maximise foraging success. To read more of this research by Górski and others in the *Journal of Fish Biology*: http://onlinelibrary.wiley.com/doi/10.1111/jfb.12777/abstract

A different sort of Salmon run

Trout Unlimited's North Coast Coho Project, in California, gets people going the extra mile for fish habitat rehabilitation at the end of each season of on-ground works – literally. An important part of long term rehabilitation projects is generating and maintaining local people's interest and motivation so the project team hosted a Salmon Run. The race along the river included several options, from 10km to 1km. Eighty-six participants ran and raised $3,000 towards a restoration project to improve instream habitat conditions in a nearby stream. Read more: http://www.tu.org/blog-posts/big-fun-for-big-fish-on-big-river?gid=5228

23 culverts later, the Salmon are back

Salmon have returned to Guichon Creek, near Vancouver, western Canada. Road crossings had been a major impediment for the fish. 23 crossings were made fish-friendly, including one under the Trans-Canada highway which had been a narrow, dark steel pipe completely blocking fish passage upstream. The next major hurdle is a 700 metre long culvert under a road and college campus. Plans are underway to 'daylight' this stretch of the creek. More: http://globalnews.ca/video/2310591/salmon-returning-to-burnaby-stream

Rock stars in Lake Michigan

For the native fish of Lake Michigan, USA, the reconstruction of rocky reef habitat is expected to help populations recover from the triple blows of overfishing, habitat degradation and invasive species. The lake once teemed with Lake Trout, Lake Herring and Lake Whitefish, but around 1960, the Lake Herring population crashed, followed by Lake Trout. One of the key habitats that had been lost was the rocky reefs used for spawning. However, fish need more than rocks: they need rocks that are baseball to softball size, with some variation available, they need to be piled 6 to 10 feet high, with a recognizable slope, and there needs to be currents that flow over the reefs to keep the eggs oxygenated. A reef with exactly these characteristics has been created in time for this year's spawning. Fish have spawned here in the past, but in low numbers and with poor success. The fish will find much improved habitat when they begin showing up. For more about this project: http://blog.nature.org/science/2015/10/27/restoring-reef-lake-michigan-native-fish/

The rocky reef in the large, freshwater Lake Michigan. Photo: Matthew Dae Smith / Big Foot Media

Alewives bringing back other species

Alewives in one of the fish lifts. This past Spring 2.1 million Alewives were lifted over the Benton Falls dam. Photo: Rick Lawrence

Alewives are a sea-run Herring that play a large role in the ecosystems in which they occur. As spawners ascended rivers in Spring, they were much needed food for starving Atlantic salmon returning to the salt after their own spawning. In Autumn, masses of alewife fry provided cover for descending salmon smolts, protecting them from predation by their sheer mass. However, dams and weirs have led to massive reduction in the Alewife population. The US state of Maine has more potential Alewife spawning and nursery habitat than all others combined and is having notable success at recovery through the removal of barriers. One example is the Sebasticook River, where the removal of key structures in the late 2000s restored the access for Alewives, along with Striped Bass, Atlantic Salmon, and Brook Trout; to much of their historic spawning grounds in the 1,000-square-mile watershed. The size of the native-fish migration in the river is now described by biologists as 'epic', with the biggest Alewife run in the USA. For more on the Alewife story: http://blog.nature.org/science/2015/10/13/recovery-alewives-the-little-fish-with-a-big-role/

Court victory for water quality

Getting three-quarters of rivers, lakes and wetlands up to good health would boost the UK economy by £8.5 billion. Photo: Angling Trust

It was a win for the UK's Angling Trust and its partners to be awarded the right to take the UK Government to court over claims ministerial involvement had stifled action to address harmful pollution from farms. The Judicial Review in the High Court has now taken place and the High Court judge recognised the need for urgent action to protect the 44 protected freshwater sites that were the focus of the case and the wildlife, including fish, living there. As a result of the legal victory, the Government must now evaluate the measures which have so far failed to protect these vulnerable places from farm pollution. Additionally, in October 2015, the European Commission issued legal guidance warning the UK Government of its failures to implement EU water legislation. For more on this story: http://www.anglingtrust.net/news.asp?section=29&sectionTitle=Angling+Trust+News&itemid=2830

Trout Unlimited Report Card

Chris Wood, President and CEO of Trout Unlimited, introduces his annual report card on the organisation's activities by saying 'Conservation is about people. It is about people who make a determined commitment to lend their time, talent, and treasure to make their communities better places to live'. Trout Unlimited volunteers have donated more than 650,000 hours in service to their communities with the result that in the past year nearly 1,400 stream miles across the US are now protected, over 570 miles of spawning and rearing habitat for fish has been reconnected, and over 140 miles of river restored. For more: http://www.tu.org/blog-posts/state-of-tu-2015

Water quality key concern for anglers

A national poll of fishers and hunters in the USA has found they care about water quality. Specifically, 83 percent supported legal protections for smaller streams and wetlands through the application of the rules and standards of the 'Clean Water Act' to these areas. Support for this policy was strong across the political spectrum with 77 percent of Republicans, 79 percent of Independents and 97 percent of Democrats in favour. Nearly 90 percent agreed with the statement: 'We can protect our water quality and have a strong economy with good jobs for Americans at the same time, without having to choose one over the other'. To read more about the poll and the results: http://www.nwf.org/News-and-Magazines/Media-Center/News-by-Topic/Wildlife/2015/07-22-15-New-Poll-Hunters-and-Anglers-Nationwide-Support-the-Clean-Water-Rule.aspx

Finally! An adult Eel spotted in the Sargasso

Eel larvae have been observed the Sargasso Sea since 1904 but the location of the place used by American Eels for reproduction remained conjecture. Researchers fitted adult Eels with satellite transmitters, and one of these fish was tracked to the Sargasso after a 2,400km migration. This is the first time an adult Eel has been observed in this part of the Atlantic Ocean. All the tracked Eels migrated along the coastline but only the one moved into the open ocean when it reached the edge of the continental shelf. For more about this research by Béguer-Pon and others in *Nature Communications*: http://www.sciencedaily.com/releases/2015/10/151027132839.htm

The American Eel. Photo: North American Native Fishes Association

Dirty columns good for fish

Urban stormwater runoff, particularly from highways and parking areas, is toxic and has long been known to be killing many of the adult Coho Salmon in urban streams along the West Coast of the USA. More than half of the Coho returning to stormwater-dominated streams every year die before they can spawn. Researchers found that inexpensive filtration of the runoff through a metre-high column made up of layers of gravel, sand, compost and bark completely prevented the toxic effects on fish. They found that all the exposed Coho survived as well as they did in clean water. For more about this research by Spromberg and others in *Journal of Applied Ecology*: http://www.sciencedaily.com/releases/2015/10/151008152225.htm

Happy fish at Hexham

The fishway at Hexham Bridge, on the River Tyne, UK, has been completed just in time for the peak of the Salmon and Sea Trout migration period. The Hexham Bridge represented a challenge for migrating fish, especially in low water. Many leaps are unsuccessful and fish were wasting energy in failed leaps, resulting in less energy for spawning when they arrive upstream. The new fishway enables migrating fish to by-pass the bridge footings by swimming up two low-gradient channels to continue on their journey up the Tyne. For more information about this project: http://tyneriverstrust.org/hooray-for-hexham-fish-pass/

The start of the construction of the Hexham Bridge fishway. Photo: Tyne River Trust

Upper Thames River gets rocked

Fanshaw Bay on the Upper Thames River, in Ontario Canada, needed more structure. Heavy machinery was used to install 200 tonnes of river stone for underwater shoals and gravel spawning beds. 125 metres of wooden cover structures were created to provide underwater shelves. The use of aquatic vegetation, stone, cedar logs and gravel will create spawning and refuge habitat as well as food producing areas for Bass, Pike, Perch, Walleye and Pumpkinseed fish. To view progress: https://www.youtube.com/watch?v=cWdSNRUdXHk

Fish ‘cribs’ were the first stage of the creation of more fish habitat. Photo: Upper Thames River Conservation Authority.

Mangrove rehabilitation in high erosion areas

A study in Vietnam compared two different approaches to mangrove rehabilitation: one a basic fence and the other a more elaborate system of fencing. The more elaborate design delivered better rehabilitation, both in terms of the trees and in the populations of crabs and other invertebrates. To read more of this research by Thornton and Johnstone in *Estuarine, Coastal and Shelf Science*: http://www.sciencedirect.com/science/article/pii/S0272771415001626

RESOURCES

Methodology for tidal wetland and seagrass carbon

This methodology provides procedures for how to calculate, report and verify greenhouse gas reductions for tidal wetlands (salt marsh, mangroves and seagrass. More information is available here or to download the methodology: http://www.v-c-s.org/methodologies/methodology-tidal-wetland-and-seagrass-restoration-v10

The story of a lost river

Silt Road is the story of the River Wye, a small chalk-stream which rises in a copse in a meadow, but is soon lost under the car parks and streets of the town its waters once gave life to. To read more about this book or to order a copy: http://charlesrangeleywilson.com/silt-road-the-story-of-a-lost-river/

River Detectives

'River Detectives' is a sustainability education program facilitated by Victoria's North Central CMA. It includes a variety of engaging, practical, multi-age, cross-curricular activities: http://riverdetectives.net.au/

Conservation of Freshwater Fishes

This book is the first assessment of the global state of freshwater fish diversity, synthesising the opportunities, challenges and barriers facing the conservation of freshwater fish biodiversity: http://www.cambridge.org/fr/academic/subjects/life-sciences/ecology-and-conservation/conservation-freshwater-fishes

South-west Australian rare freshwater fishes and their habitat

A video taking viewers on an aerial, ground and underwater journey across rivers and lakes crucial to the survival of rare and endangered freshwater fishes, the Western Trout Minnow, Balston's Pygmy Perch and Little Pygmy Perch: https://www.youtube.com/watch?v=3QeT5gh0PFI

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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Recreational Fishing Trusts

NSW GOVERNMENT Department of Primary Industries

FISH HABITAT NETWORK

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

Capital Region Fishing Alliance http://crfa.org.au/

Ecofishers www.ecofishers.com

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

Fisheries Victoria www.dpi.vic.gov.au/fisheries

Freshwater Fishing & Stocking Association of Queensland (FFSAQ) www.ffsaq.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/

RecfishSA www.recfishsa.com.au

RecfishWest www.recfishwest.org.au

Recreational Fishing Alliance of NSW www.rfansw.com.au

SUNFISH www.sunfishqld.com.au

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Western Australia Department of Fisheries: www.fish.wa.gov.au/Pages/Home.aspx