

Newstreams

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

AUSTRALIAN NEWS

Fish habitat projects are winners

Three projects that improve fish habitat have come out winners in the Natural Environmental Protection and Enhancement: On-Ground Works category of the NSW Local Government Awards. Richmond Valley Council's *Fisher's Way: Working with stakeholders to repair Jabour Weir Fishway* project, which involved both recreational and commercial fishers, was Highly Commended. Also Highly Commended, Greater Taree's epic work *Big Swamp, Big Plume, Big Results*, which is restoring tidal flows and reducing acid run-off from drained floodplains into the Manning River. The winner in this category was Kogarah City Council for their innovative seawall, which mimics the habitat variation of a natural rocky foreshore. Since its construction, over twenty five species of aquatic flora and fauna, including juvenile fish, have established themselves in this new habitat. For summaries of the projects: <http://bit.ly/1yx18Jz>. For more detailed information about the seawall project: <http://bit.ly/12FUEiu>



Fishers working with Council to repair the Jabour Weir fishway, Richmond River. Photo: Pat Dwyer



Reducing acid run-off and reinstating tidal flows into the Manning. Photo: Greater Taree City Council



Re-thinking the seawall – a design that mimics natural rocky shore variation. Photo: Kogarah City Council

Fish enjoying the Gunbower Creek watering

Huge numbers of native fish have used a purpose-built lock to move from Gunbower Forest floodplains to Gunbower Creek and eventually the River Murray. 14,000 fish found the exit as managers implemented a 'fish exit strategy' which involved lowering inflows in a pulsing pattern. More recently, European carp have been detected in higher numbers. However, monitoring showed that some native fish continue to move during the night so the fishlock was turned off during the day to prevent young carp from moving into Gunbower Creek during daylight hours when they are highly active, while allowing native fish to migrate into the creek overnight. More: <http://bit.ly/1rNgLJ>



Tens of thousands of small-bodied native fish, such as Australian smelt (pictured) and gudgeons, exited Gunbower Forest's floodplain through the purpose-built fishlock. Photo: North-Central CMA

Floodplain farmers go with the flow

The 'Go with the Flow' program has enabled farmers on the Richmond River floodplain of the NSW north coast to improve natural wetland conditions as well as utilise once dry swamps for grazing. Many artificially drained wetlands along the NSW coast have poor soils, which produce sulfuric acid when dry and this contributes to fish kills. The installation of regulators has given farmers the ability to both manage their wetlands as part of a productive system and maintain higher groundwater levels. Around 300 hectares of wetland area has benefitted and seen significantly improved conditions for fish. For more information, contact [Simon Walsh](#) or visit: www.dpi.nsw.gov.au/aboutus/news/all/2014/farmers-go-with-the-flow-on-the-states-north-coast



What a difference some water makes! Good for fish and for farmers. Photos: Simon Walsh.

Nearly a million seedlings makes a winner

The Lakes Community Revegetation Project, run by the Goolwa to Wellington Local Action Planning Association, South Australia, has taken out the Australian Government Partnerships with Landcare Award for 2014. Since 2010, the project has resulted in volunteers from over 54 community groups (in excess of 3000 volunteers per annum) planting 951,770 seedlings on 97 sites. This project is part of the Murray Futures Program and focussed on the restoration and rehabilitation of the Coorong and Lower Lakes wetlands system. More information: <http://bit.ly/1txWKbm>

Back in Bookmark

The latest seasonal fish monitoring at Bookmark Creek, South Australia, provided data for the ongoing assessment of rehabilitation efforts as well as opportunities for volunteers to see different fish species, particularly native fish that typically would not be captured when fishing on the river. Bookmark Creek is considered a unique site in South Australia as it by-passes a lock, creating a significant flowing habitat that is now uncommon in South Australia due to river regulation. The range of habitats created – varied flows, deep and shallow water, a variety of submerged vegetation and snags – supports a diverse range of fish species. Fifteen species of fish, including ten native species, have been found. Small-bodied native fish species, including carp gudgeons, unspotted hardyhead and flathead gudgeons, have been the most abundant species captured during surveying. More information: www.naturalresources.sa.gov.au/samurraydarlingbasin/news/141125-bookmark-creek-fish-surveys

Is the habitat conversation happening?

A review of various forms of recreational fishing media has found that there is not much conversation about fish habitat. Where habitat is referred to, it is almost always in association with where to find an adult fish rather than what fish need to survive and thrive throughout their life cycle. To read the report by Miles and others: <http://bit.ly/1zaLxRX>

The historical ecology of Snapper

Snapper living along the east coast of Australia are an important species for both commercial and recreational fisheries. These fish can live for 30 years so the impacts of habitat change and fisheries management can have long-reaching implications for the population. A review of historical sources has come up with a way of validating data from different sources to enable a rigorous assessment of how Snapper populations have changed over time. An analysis of historical accounts, including newspapers, of the Snapper recreational fishery South-east Queensland from the late 1800s through to the 1930s the authors have quantified a catch rate of 3.75 snapper per fisher per hour. Data from the contemporary charter fishery (1993 – 2002) yields a catch rate of 0.4 snapper per fisher per hour. More of this study by Thurstan and others in *Fish and Fisheries*: <http://dx.doi.org/10.1111/faf.12103>



Catch from a snapper fishing trip, south-east Queensland, in about 1900. Image extracted from Thurstan 2014.

Bridging the gaps in mangrove rehabilitation

Mangrove habitat is important for fish and the recognition of the impacts of its ongoing decline have led to growing interest in rehabilitation. The success of these rehabilitation efforts, however, has been mixed. A review by Dale, Knight and Dwyer identified insufficient information, inappropriate methods, not involving local communities, and gaps in best practice as factors contributing to less successful rehabilitation efforts. They suggest that better integration between the ecological and social components relevant to each site would be beneficial. More on this review in *Wetlands Ecology and Management*: <http://link.springer.com/article/10.1007/s11273-014-9383-1#>

Marine debris and wildlife don't mix

Marine debris was listed as a key threatening process under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* but its sources, distribution and effects on wildlife were not well quantified for Australia. Researchers from CSIRO have found that plastic makes up approximately three-quarters of the rubbish along the coast. In coastal and offshore waters, the density of plastic ranges from a few thousand pieces of plastic per km² to more than 40,000 of pieces of plastic per km². Despite more than six million tons of fishing gear being lost in the ocean each year, it does not even make the list of the top 10 most common items found during coastal clean-up. More of this research by Hardesty and others: <http://apo.org.au/research/understanding-effects-marine-debris-wildlife>

Too much lead

The McArthur River Mine, Northern Territory, has been found to have more problems than it thought with acid mine drainage and lead pollution. The Independent Monitors Environmental Performance Annual Report found that in 2013, nine out of ten fish sampled in Barney Creek were above the ANZFSC guidelines for lead levels. This follows similar results in 2012 and in other sampling sites. The amount of waste rock that now has to be managed has risen from the original estimate of 10% to 80%. More: <http://afant.com.au/2014-mcarthur-river-mine-independent-monitor-report/>

Letting the lagoon go dry

Thegoa Lagoon, at Wentworth, NSW, is being allowed to dry out over summer. Drying phases are important for ephemeral wetlands like Thegoa Lagoon as it allows sediments to stabilise and the aquatic seedbank to reset, ultimately improving habitat for fish. However, the primary driver of this year's drying out is Carp. Already this year, five tonnes of mature carp have been removed from the lagoon and a drying phase will address the remaining carp population. A carp screen has been installed to prevent movement of adult carp from the river into the lagoon. There are plans to have environmental water flow into the lagoon in late autumn next year. More:

www.environment.nsw.gov.au/media/OEHMedia14111701.htm



Thegoa Lagoon – going dry over summer to kill off the Carp. Photo: Lower Murray Darling CMA.

INTERNATIONAL NEWS

Bringing back the curves

In the 1960s, the Kissimmee River in Central Florida, USA, was straightened into a 50-mile long canal to drain swampland. It worked, but created an ecological disaster. Even the piles of dirt dug for the canal have remained heaped on its banks. So it was decided to restore the river's slow-flowing, meandering path. Bulldozers have pushed the dirt back into the waterway, filling it and making way for the river's old meanderings to re-occur. Five dams are being removed, allowing the return of natural flows. While not yet complete, work to date is already showing benefits for fish and other wildlife. The oxygen levels in the river have improved and there are a lot more game fish in the river like bass and bluegill. Once the ecological function is restored, it's hoped that designating the area a 'water reservation' will enable some water to be held for ecological purposes and to maintain the system's hydrology. Read more: www.npr.org/2014/10/19/356647396/the-kissimmee-a-river-recurved



The Kissimmee River before and after efforts to restore its natural form and function. Image source: South Florida Water Management District.

A clean and marvellous explosion

Spain is also removing barriers to fish passage. The largest dam removal project in Spain is part of the Cofio River Restoration Project. The latest dam removal as part of this project was the 'clean and marvellous explosion' that removed a structure on the Colio River that was 23m high and 60m wide. More: <http://vimeo.com/107684886>

Fishing the benefits of habitat

In 2010, the Hutton Rudby Fly Fishing Club in the UK decided to stop stocking trout for the first time in 80 years and work with the Wild Trout Trust to improve the habitat of their river, the River Leven in Yorkshire. Club members' catch logs have revealed that the average catch rate for all members was 100% higher in 2014 than for previous years. They have also found immature grayling and Salmon, providing evidence that these species are now breeding in the river. The Club has been involved in improving bank cover, re-snagging, improving flows to re-create the habitat that will favour both juvenile and adult fish. Read more: <http://bit.ly/1wssN39>, with the December 2014 update here: <http://bit.ly/1A9eHKD>



Members of the Hutton Rudby Fly Fishing Club are seeing the benefits of their investment in habitat improvement, which has included re-snagging. One angler in November 2014 caught both a trout and a grayling on the one cast! Photos: Hutton Rudby FFC.

Sediment management good for fish

Researchers in New Zealand manipulated 50m stretches of river to find out more about the impact of sediment on aquatic invertebrates and fish, both the introduced brown trout and natives. It was known that high levels of fine sediment change the quantity and composition of the invertebrate community that fish prey upon, resulting in reduced feeding, growth and survival. The researchers found that adding sediment reduced the number of different invertebrate species, while sediment removal had the opposite effect. The average density of fish (brown trout, total natives and eels) was always lowest in the reaches where sediment had been added and generally highest where it had been removed. More on this research by Ramezani and others in *Freshwater Biology*: <http://dx.doi.org/10.1111/fwb.12456>

What river restoration means for locals

Researchers looked at how people living around the River Dearne, in the north of England, perceived the outcomes of a river restoration project 14 years on. Despite water quality improvements, by the 1980s poor in-stream physical habitat were limiting the potential for fish to spawn. The restoration scheme was implemented in 1995 to increase the longer-term value of the river for spawning. The researchers found that several features influenced people's perceptions, including how clean the river was, the presence of litter and how tidy different types of riparian vegetation appeared. While having a more natural river was seen as good for animals, including fish, many people had a more positive view of the 'tidy' banks and thought these were the restored areas, rather than the banks that had been revegetated. The cultural values of river restoration were found to be both varied and, at times, contradictory and this work highlights the need for such values to be considered alongside ecological factors in designing restoration projects. More on this work by Westling and others in the *Journal of Hydrology*: <http://dx.doi.org/10.1016/j.jhydrol.2014.09.029>

Mangroves and fish

A review of the importance of mangroves for fisheries provides a snapshot of the social and economic benefits associated with this habitat. The authors conclude that fish productivity from mangroves will be highest where there is high freshwater input from rivers and rainfall and where mangroves are in good condition. The area of mangroves in total is less important than the edges – more edge is better, and the complexity of habitat provided – patterns of channels, pools and lagoons as well as root structures is also important. Some 210 million people live in within 10km of mangroves and many benefit from mangrove-associated fisheries. It is estimated that the median value of inshore, largely subsistence fishing from mangroves was US\$106 per ha of mangrove per year. Globally, the mean value is around \$3114 per ha per year. More of this review by Hutchison and others: <http://bit.ly/1rOxVXD>



The global, mean value of complex mangrove habitat is estimated to be US\$3114 per ha per year in terms of fisheries production. Photo: Dylan Vandermeulan

The gift that keeps on taking!

In 1884, the visiting Japanese delegation to the World's Fair in New Orleans handed attendees a seemingly innocuous gift: a beautiful aquatic plant native to South America. Within a couple of years, it had choked backyard fish ponds, moved into rivers and was so thick in some rivers that navigation was impossible. The plant, water hyacinth (*Eichhornia crassipes*), now clogs waterways, blocks sunlight and de-oxygenates water across America. In California, the 2014 drought conditions and warm water temperatures have resulted in the worst outbreak of water hyacinth ever seen. The impact on migrating Salmon is not known so researchers used underwater cameras to look at how salmon behaved as they encounter the floating rafts. Their results were mixed, made more difficult due to a 90 per cent drop in number of Salmon returning to the river they studied. More: <http://fishbio.com/field-notes/the-fish-report/hyacinth-woes-gift-curse>



Water hyacinth is responding vigorously to the warm, drought conditions in parts of America. Fish numbers are down but it's not clear how much the weed is to blame. Photo: fishbio.com

Daylighting streams

Concreting or channelling streams into pipes was a common practice, particularly in urban areas where the control of surface run-off and stormwater was considered desirable. In the USA, some of the 'disappeared' streams are being 'daylighted' in order to provide habitat, prevent pollution and recapture the benefits of surface water. The process involves reconstructing the streams to have a gradual slope, so that they more closely resemble a series of small, stepped ponds than a single river. Small bumps and sand mounds slow water down and cause it to spread out, mimicking the actions of beavers or logjams that would have been a feature in the natural state. For more information:



At times, more like archeology than river rehabilitation but daylighting streams is all about restoring these waterways as functioning aquatic systems. Image source: www.nationalgeographic.com

<http://news.nationalgeographic.com/news/2014/11/141125-dc-daylighting-broad-branch-stream-restoration-science/>

The re-incarnation of a lost river

Norfolk Rivers Trust is bringing back the River Nar in the United Kingdom. Unusually, this chalk stream had about four hundred metres left more or less untouched and looking much as it would have since antiquity. Such a relic channel is a true rarity on English chalk-streams, which have been heavily modified. Restoring the relic channel was like peeling varnish off an old painting: carefully removing sediment but not damaging the underlying beds or bank profile. Now, for the first time in about two hundred years, water is flowing through the relic channel into the main river. More:

<http://charlesrangeleywilson.com/2014/11/11/restoration-drama/>



Before: it was not easy to see the relic channel



During: a delicate process



After: upstream, the river is as close to an unmodified English chalk-stream as exists.

Photos: <http://charlesrangeleywilson.com>

Wetland woes confirmed

Humans have been draining and in-filling coastal and inland wetlands for many centuries and it had been estimated that around 50% of these wetlands had been lost. A review has found this to be an underestimate. The average loss of natural wetlands was found to be between 54–57%, but loss may have been as high as 87% since 1700 AD. The conversion and loss of wetlands occurred at a much faster rate in the 20th and early 21st centuries, with the result that 64–71% of the wetland area present in 1900 AD was lost in the 20th century. In some regions, for example Asia, this figure was higher and the loss is continuing. More of this review by Davidson in *Marine and Freshwater Research*: <http://dx.doi.org/10.1071/MF14173>

New snags, old snags: different food for fish

The rough, decaying surface of old woody debris supports more macroinvertebrates than the smoother surface of new snags, but not more or different species. Researchers also found that despite the types of invertebrates living on both the old and the new snags being the same, what fish fed upon was different. The age and condition of the snag did not affect how much fish ate, just what they ate. More on this research by Czarnecka and others in *Freshwater Biology*: <http://dx.doi.org/10.1111/fwb.12446>

Replenishing a River

The Stanislaus River, which flows through California's Oakdale Irrigation District, is being restored to create habitat for adult Salmon to spawn and for juveniles to grow out. The river is valued as a community asset, supplying irrigation water and supporting both recreational fishing and tourism. A video documenting this project is available here:

www.youtube.com/watch?v=-yM9qfiQLA&list=UUaHWeevSgMm8fs0sbqM_p0Q



Salmon are one of the fish benefitting from the Stanislaus River restoration project. Image source: www.fishbio.com

Crowbars for croys

Three 'croys', structures made up of large boulders arranged in a line, in the River Dee, Scotland, have been removed to help restore the River's natural channel and improve habitat for fish and freshwater pearl mussels. The croys, created in the 1990s, were once a common fisheries management practice in Scottish rivers. It was thought that they would create pools for salmon and subsequently increase fish catches. This was not the case and by directing flow towards the middle of the channel, the croys led to scouring of the river bed, increased depth and speed of the water and erosion on the bank. This had a negative effect on salmon spawning habitat. The boulders that made up the croys have now been re-distributed randomly in the River, breaking up the flow and allowing the gravel spawning beds to recover. The boulders will also provide habitat for freshwater pearl mussels as well as 'lies' for adult salmon. For more information:

<http://www.riverdee.org.uk/blog&news/newsevents.asp?article0=181&srch0=#0>



The process of restoring the River Dee for Salmon. Photos: River Dee Trust.

The long arm of mining

Scientists at Michigan State University, USA, have found that mining can damage fish habitats kilometres downstream and even in streams not directly connected to the mines. They found that mines have a much stronger influence on fish than had been assumed and much further downstream. The impacts associated with mining vary but can include the addition of sediments and chemicals to rivers, alteration of flow and loss of vegetation, all of which can change fish habitats. By looking at cumulative data that includes catchment-wide information from headwaters and tributaries the researchers conclude that mines form a 'regional stress' affecting fish populations. More on this research by Daniel and others in *Ecological Indicators*: <http://dx.doi.org/10.1016/j.ecolind.2014.10.018> or a summary: www.sciencedaily.com/releases/2014/11/141125111851.htm

RESOURCES

Finbox – a demonstration reach toolbox

'Demonstration Reaches' were established across the Murray-Darling Basin as part of the Native Fish Strategy. The toolbox provides resources based on the insights into what is needed for successful creation and implementation of demonstration reaches and river rehabilitation in general, the challenges that exist and how best to address these.

<http://www.finterest.com.au/finbox-a-demonstration-reach-toolbox/>

Environmental watering of Hattah Lakes videos

Under The Living Murray program, the Hattah Lakes icon site is provided with environmental water to help achieve its ecological objectives. These videos explain the Hattah Lakes system and the issues and benefits associated with watering.

www.mdba.gov.au/about-basin/environmental-sites/hattah-lakes

UNEP-DHI online water and sustainability game

Participation is free in this global on-line competition to align the demands of government, commerce, health and industry to manage a water supply. Designed for students aged 11 to 17 years. Australian participation in 2015 will be hosted by Curtin University.

<http://bit.ly/1Gbh201>

FROM THE ARCHIVES – CHRISTMAS PAST

Night prawning *The Sydney Morning Herald* (Sydney), Wednesday 27 December, 1911

Good hauls of sand mullet, gar and flathead are reported from Narrabeen where night prawning is a popular pastime. ... The scene at night during the holidays at Narrabeen when hundreds of people were busy in bathing costumes catching prawns which were attracted to lights carried close to the water was a remarkable one. The prawns at Narrabeen are of splendid quality and are much sought as food by the thousands of campers of the district.

Christmas at Queanbeyan *The Age* (Queanbeyan), Friday 29 December, 1905

Several members of the Young Men's Club rode out to the Murrumbidgee on bicycles and spent their holidays in a laudable effort to coax its finny denizens from their cool retreat. In this they were moderately successful, and fifteen fine perch and cod fell to their rods and lines. Another party went to the Cotter and commencing at its junction with the Murrumbidgee, fished up for about six miles. Though fish were plentiful, they were not in the mood, and a very poor bag was secured. The magnificent scenery of this beautiful river, however, was a compensating element and a bathe in its crystal depths made up for the fish left behind.

The exodus of anglers *Western Mail* (Perth), Friday 24 December, 1915

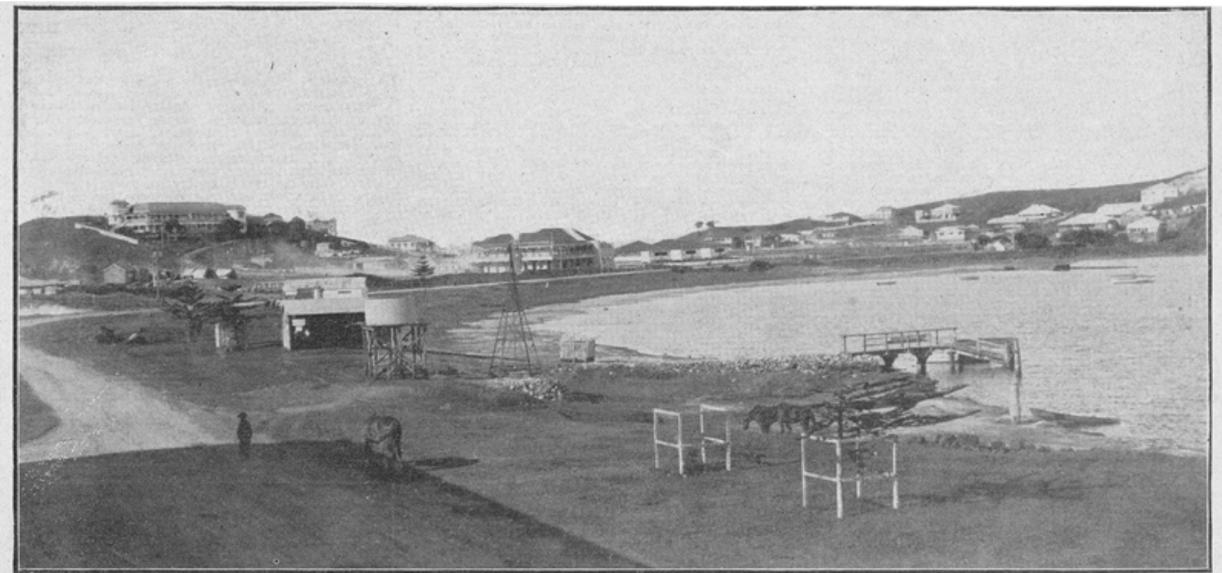
The exodus of anglers continues like the flowing tide, and as fishing is good all along the coast they should pass a very pleasant Christmas, and return full of health and renewed vigour for another year. Large snapper and jewfish have been extremely plentiful from Geraldton to the Leeuwin, and news of good catches ... [received from Mandurah]: " The catch included 35 beautiful snapper, averaging 151b.."

Murray cod for tea *Chronicle* (Adelaide), Thursday 17 December, 1936

I live near the River Murray, which is very high at present; it is a magnificent river and those who haven't seen it, have no idea of its size, or the beauty that surrounds it. People seem to flock to the riverside in the summer time, or even on any pleasant day; perhaps only to sit in the shade of a big gum tree and gaze at the placid waters. Others have a small boat and pull leisurely along. In the fishing season one sees scores of motor cars lined along its bank with the men sitting on the edge of the bank trying to catch a nice Murray cod for tea. We have gone out scores of times and brought home enough fish for several meals, and not small ones either some eight and ten pounders.

Christmas at Tweed Heads

(1921, Image: State Library of Queensland)



Caption under the photograph reads:

This delightful watering-place at the mouth of the Tweed River At Christmas time . . . nearly 10,000 people made it their rendezvous. . . . There is excellent sea-bathing, oysters are plentiful, fishing is good, . . . the scenery along the banks being most fascinating. . . . The district has made wonderful progress in recent years. . . . [And] a great deal of land has been brought into use, both by clearing the scrub and reclaiming by drainage a very large area of the swamp lands of the lower part of the river.

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 (newstreams@industry.nsw.gov.au). Back issues can be accessed from <http://www.fishhabitatnetwork.com.au/archive>.

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FHN 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/>

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.ffa.org.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

Sweetwaterfishing <http://www.sweetwaterfishing.com.au>

Victorian Department of Environment and Primary Industries www.depi.vic.gov.au

VRFish www.vrfish.com.au

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

Website www.fishhabitatnetwork.com.au

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