

Newstreams

A newsletter for recreational fishers and others interested in improving fish habitat to build native fish stocks.

No 22 October 2009

About Newstreams

Newstreams is an email newsletter to keep people up to date about NSW fish habitat activities and important aquatic habitat developments elsewhere. It is published electronically every two months by Industry & Investment NSW. In NSW many estuarine and freshwater habitats for juvenile and adult fish have been degraded or lost through urban, industrial and agricultural development. Communities around NSW work actively to restore fish habitat.

DEPARTMENT NEWS

Fish habitat grants close on 16 October

Fish habitat action grants funded by NSW Recreational Fishing Trusts and made available through Industry and Investment NSW, close on 16 October 2009. The grants are available to fishing clubs, Landcare and Rivercare groups, community groups, individuals and local councils interested in rehabilitating fish habitat. Past grants have helped to remove invasive vegetation, re-establish native vegetation on riverbanks, remove barriers to fish movement, re-snag waterways, restore natural tides to former estuarine wetlands, open floodgates and fence riverbanks to prevent cattle trampling the banks. Find out more at the website below, or ring Charlotte Jenkins on 02 6626 1107.

<http://www.dpi.nsw.gov.au/fisheries/recreational/info/habitataction>

Temporary fishway for sandbarred fish in Tuross River



When Tuross River flows are low, local dairy farmers place a sandbar across the river to create a water storage, and include a temporary fishway so fish can move past the barrier. When the river flow increases, the fishway is taken out and the sandbar washes away. The fishway was constructed by I&I NSW and funded by the Southern Rivers CMA. Photos: Trevor Daly.

trevor.daly@industry.nsw.gov.au

making more fish ...naturally

aquatic habitat rehabilitation

Workshop on habitat in stormwater drains

Stormwater drains aren't the first area that comes to mind when thinking about fish habitat, but fish, including the threatened Oxylean pygmy perch, live and breed in them. Design and maintenance of these drains can influence fish survival, so I&I NSW has put together a practical workshop for anyone with an interest in managing stormwater in rural areas. It includes sessions on planning, onground works and field visits with staff from Richmond Valley Council. The free workshop is supported by the NSW Government through its Environmental Trust. It will be held at Casino, northern NSW, 3 November (afternoon tea will coincide with Melbourne Cup coverage). RSVP October 20 2009 to Charlie Carruthers 6626 1360 or email.

charlie.carruthers@industry.nsw.gov.au

http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0003/296076/stormwater-workshop.pdf



Is this a stormwater drain or threatened species habitat? It's both! (Photo: Richmond Valley Council)

Tagging fish for Nepean habitat project

Hundreds of fish are being fitted with tags as the Nepean River undergoes one of the largest rehabilitation projects ever to be undertaken on a coastal stream in NSW. I&I NSW fisheries researchers at Narrandera have been awarded a three-year contract to monitor fish response to the 13 new fishways to be built. The researchers are fitting fish with yellow external tags and microchips, taking fin clips to see if the fishways contribute to genetic diversity, and electrofishing to survey fish in the river before and after fishway construction. The fishways will all be vertical slot designs to cope with the number of fish and the range of sizes. If people catch a legal sized fish with a tag they can keep it and report it to the hotline 1800 185 027 to collect a reward, but it will help the research effort more if the fish are returned to the water.

http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0005/299057/33-million-project-helps-fish-migration-in-the-Nepean-River.pdf

Fish Friendly Farmers revitalising fish stocks in the Murrumbidgee



Chris Muller by his fenced off riparian zone, which he has since replanted. Photo: Charlotte Jenkins

Beef farmers Chris and Lila Muller hosted a Fish Friendly Farms field day at their 'Parklands' property near Wagga Wagga on October 1. Parklands is one of eight farms across the state which has received funding to become more fish friendly and enhance habitat for native fish. The Mullers have carried out extensive works on their property, including fencing and off-stream water troughs to manage stock movement near watercourses, and revegetation of the river banks with native trees and shrubs. Farmers, landcarers, and local recreational fishers were invited to see what the Mullers are doing to help improve the health of Tarcutta Creek and the Murrumbidgee River, and boost native fish numbers. For further details, contact Charlotte Jenkins on 6626 1107 or email.

charlotte.jenkins@industry.nsw.gov.au

Fishway survives floods



A rockramp fishway completed earlier this year on the Orara River (a Clarence River tributary located near Coffs Harbour) has stood up well to the floods in May-June. Despite strong flows, localised scour and floating camphor laurel trees, the rocks did not move, and gaps between the rocks are now filled with gravel, further stabilising the structure. Moreover, recent sampling above the crossing revealed a 600mm eastern freshwater cod, a federally listed endangered species.

Photo: Matt Gordos.

Wetlands on Farms in the Lachlan catchment

Over the last ten months seven landholders in the Lachlan Catchment area have worked with the Wetlands on Farms program team (funded by the Lachlan CMA) to complete wetland management plans. Lachlan catchment wetlands include billabongs, floodplains, upland lakes, riparian areas and the nationally recognised Booligal Wetland south of Hillston that provides critical habitat for numerous waterbird species and is one of Australia's most important breeding sites for straw-necked, white and glossy ibis.

Landholders participating in the Wetlands on Farms program are making positive changes that will benefit the future viability and health of these vital wetland areas, most of them highly stressed due to lack of significant rainfall or flooding in recent years. Actions include fencing, altering grazing regimes, planting riparian revegetation, controlling weeds and pests, and installing off-wetland watering points.

Wetlands on Farms project officers work closely with landholders and the CMA to identify appropriate goals and actions to reduce the impacts on these wetlands. The CMA assists with incentive funding for onground works and training to increase skills. For more information contact I&I NSW in Dubbo on 02 6881 1284.



Above: Booligal Wetland during a dry phase.
Photo: Grant Gunthorpe.

WANTED

Seeking recreational fishers for a habitat network.

Receive info about habitat rehabilitation.

Share habitat stories.

Find out about habitat funding.

Phone: 02 6626 1107 Email: fish.habitat@industry.nsw.gov.au

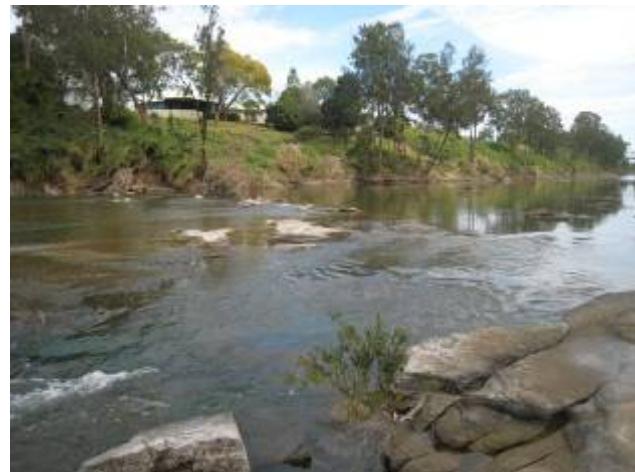
BRINGING BACK THE FISH: PHOTO FILE

Bringing Back the Fish is a three year project between I&I NSW and NSW's five coastal CMAs. The CMAs provided \$3 million in funding and I&I NSW staff provided technical input. The project aimed to improve fish passage at priority barriers and improve key fish habitat. On the following pages most paired pictures show before (left) and after (right) recently completed works in coastal regions. A final report will be produced for the project and will be available from I&I NSW website by the end of the year. Photos by I&I NSW staff. If you'd like to know more about any of the projects, email Matt Gordos about northern projects, and Scott Nichols about Sydney and south coast projects.

matt.gordos@industry.nsw.gov.au scott.nichols@industry.nsw.gov.au

Northern Rivers CMA region

Manyweathers weir, Richmond River, Casino



This weir, owned by the State Water Corporation, provided town water, but became redundant in the 1990s due to the upgrade of an upstream weir. SWC removed the weir in July and native fish, including Australian bass, now have access to 300 km of upstream habitat. Additional funding was provided by SWC and NSW Recreational Fishing Trust.

Hickeys Creek weir, Macleay catchment



This weir, also owned by the State Water Corporation, was built in 1970 to provide droughtproof stock water, but no longer pooled water during baseflows. SWC removed the weir in September, improving fish passage to 60 km of upstream habitat.

Old Lismore Road crossing, Oxley River, near Murwillumbah, Tweed catchment



This crossing restricted fish passage due to excessive headloss across the 22 cell box culvert. A 10 m low-flow section was inserted to provide improved fish passage to 16 km of upstream habitat. Additional funding was provided by the NSW Recreational Fishing Trust, and Tweed Shire Council.

Houghlahans Creek crossing, near Lismore, Richmond catchment



A downstream bridge replaced the need for the four-celled pipe culvert several decades ago, but the crossing remained and limited fish passage due to excessive headloss and high water velocities. The Crown Land crossing was removed in a single day, and rock inserted into the banks and bed of the creek to stabilise the site. Fish can now move upstream for another kilometre.

Tucki Tucki Creek crossing, near Lismore, Richmond catchment



This obsolete rock fill/concrete crossing was removed in a single day, improving fish passage to 16 km of upstream habitat. Additional funding was provided by Lismore City Council through Northern Rivers CMA.

Lack Creek, near Mullumbimby, Brunswick catchment



Road realignment left two obsolete crossings (above left) that were breached but directed water onto adjacent banks, causing mass bank failure (below left). Works involved removal of the crossings (above right) and regrading adjacent banks to improve stability and reduce sediment in the creek (below right).



Brunswick River, near Mullumbimby



As part of its construction of a new sewerage treatment plant for Mullumbimby, Byron Shire Council is undertaking extensive property rehabilitation to improve biodiversity and aquatic health along Brunswick River. Works include fencing of two km of waterway, revegetation of the riparian zone, stabilisation of massive bank failure, and rehabilitation of two oxbow lakes. Funding for all projects on this page was mainly provided by Byron Shire Council with additional funding from NSW Recreational Fishing Trust.



Hunter Central Rivers region

Locketts Crossing, near Coolongolook, Great Lakes catchment



This new fishway at Lockett's Crossing, near Coolongolook, has restored fish passage to 65km of instream habitat in the Coolongolook River. Additional funding was provided by NSW Recreational Fishing Trust, Caring for our Country, and Great Lakes Council.

Clarksons crossing, Wallamba River, Great Lakes catchment



Clarksons Crossing was a redundant crossing that had been long been identified as an important fish barrier on the Wallamba River. The crossing's concrete cap has been removed and a fishway installed to restore fish passage to 3km of upstream habitat. Additional funding was provided by NSW Recreational Fishing Trust and Greater Taree City Council.

Old Pacific Highway crossing, Wang Wauk River, Nabiac, Great Lakes catchment



This crossing was replaced by a bridge several decades ago, but continued to restrict tidal exchange and fish passage. Greater Taree City Council removed the crossing in a week, and revegetated banks. Fish can now move a further 15 km upstream. Additional funding was provided by council.

Lansdowne weir, Manning catchment



Mid Coast Water modified Lansdowne weir to improve fish passage through the bypass rock-ramp fishway. More water will now flow through the fishway before spilling over the weir, thereby improving fish access to over 5 km of upstream habitat. Additional funding was provided by Mid Coast Water.

Darawakh wetland/Wallamba River, north of Forster, Great Lakes catchment



Great Lakes Council has completed rehabilitation works for the Bringing Back the Fish project in Darawakh Wetland and along the Wallamba River. Council breached levees within Darawakh Wetland to improve water transfer in a 100ha area (left). Massive bank erosion was addressed along a 1 km stretch of the Wallamba River through the insertion of rock fillets which provide bank stability and assist in mangrove recruitment (right). Additional funding was provided by Great Lakes Council.

Sydney region

Ingleburn weir, Georges River



This heritage weir was breached in the early 1990s, allowing some fish passage, but debris limited movement at low flows. The breach has now been widened by removing loose rock which in turn was used to strengthen other parts of the deteriorating structure. The weir is now stabilised, and fish have access to 1.3km of upstream habitat at low flows, and 5.5km at low-medium flows. Additional funding was provided by Campbelltown Council.

Parramatta River, Melrose Park



Parramatta City Council has controlled dense exotic vines in 3000m² of fringing saltmarsh and mangroves next to Wharf Road, Melrose Park. The vines had been shading out and killing the saltmarsh and mangroves that provide valuable fish and crustacean nursery and breeding habitats. Additional funding, follow up weed control and replanting provided by council.

Hawkesbury & Southern Rivers regions

Bayview, Hawkesbury catchment, and Shoalhaven Heads, Shoalhaven catchment

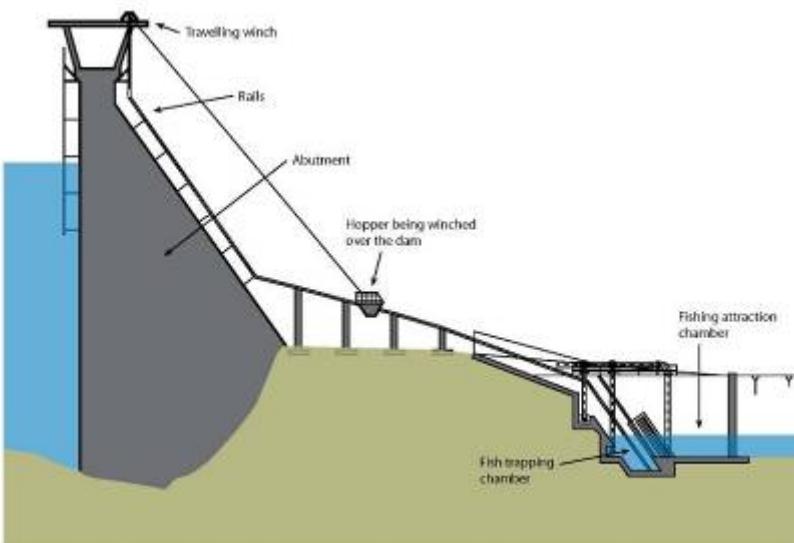


Auto-tidal floodgates have been installed at Bayview on the Hawkesbury (left), and Shoalhaven Heads, in the Shoalhaven (right) as part of the Bringing Back the fish project. These structures open and close with the tide which gives fish access to upstream habitat. The tidal exchange improves upstream water quality, buffers the effects of acid sulfate soils (where present), increases oxygenation, and reduces nutrients. The projects were supported by Shoalhaven City Council, Pittwater Council, local Shoalhaven Heads landholders, and Bayview Golf Club.

NSW NEWS

Tallowa Dam fish lift opens

Fish can now move over the 43 metre Tallowa Dam wall on the Shoalhaven River thanks to a new fish lift. When fish reach the dam wall they meet a flow of upstream water which guides them into a 2500-litre hopper. When the hopper doors close, fish and water are carried over the wall and released. The hopper makes the trip 18 times a day.



The lift is fitted with places for fish to hide, and Sydney Catchment Authority has also established refuge habitats for smaller fish to hide in as soon as they are released upstream. Angling is banned near where the fish are released. Altogether \$26 million has been spent on the project which includes the lift, a new downstream fishway, and a dam upgrade to allow environmental flow releases downstream at improved temperatures. The new flows are designed to better mimic natural river flows and will see more water released downstream overall.

<http://www.sca.nsw.gov.au/news/ministerial-media-releases/01aug09>

Above: A cross section diagram of the lift. Diagram ©SCA

Left: An aerial view of the fish lift. Photograph by TVU supplied by Sydney Catchment Authority. ©SCA

NSW river restoration news

New fishways and regulators are helping improve environmental water flows in inland NSW under the NSW Rivers environmental restoration program (RERP). Regulators in the Lachlan and Lowbidgee catchment will improve flows to downstream wetlands, and fishways will improve fish movements at Marebone weir on the Macquarie River northeast of Warren, Tarabah Weir on the Lowbidgee River, and Lake Brewster weir on the Lachlan. Other projects include restoration of the Gingham watercourse in the Gwydir catchment, a Narran fish rehabilitation study, and temperature curtain for Burrendong dam.

<http://www.statewater.com.au/About+Us/News+and+Events/Media+releases/Awarding+of+contract+to+fish+freeway>

New plan for Macquarie Marshes

The state and federal governments have developed a new plan to try to save the Macquarie Marshes near Warren in western New South Wales. The Adaptive Environmental Management Plan concedes for the first time the internationally significant wetlands are in trouble. To stop the decline the draft plan recommends water recovery, building on sustainable land management practices and improving water management infrastructure. The Federal Government has warned Ramsar of a likely adverse change in the wetlands' ecological character. The final version of the Plan due to be released by the end of 2009.

http://www.wetlandrecovery.nsw.gov.au/Management_Framework.htm

Proposed Tillegra Dam will affect Williams River fish and habitat

The environmental assessment of the Tillegra Dam proposed for the Williams River in the Hunter Valley has identified 12 species of native fish in the river, eight of which migrate to estuarine habitats as part of their life cycle. The report notes that the most significant environmental costs will be losing aquatic and riparian habitat upstream of the dam wall. The dam would form a barrier approximately 76 metres high and 800 metres wide across the Williams River at Tillegra, permanently isolating the uppermost 54 kilometres of the main river channel and associated tributaries. This would effectively prevent upstream and downstream movement of aquatic species along the river permanently. A fishway would cost around \$30 million and the assessment states 'it is considered there would be greater environmental and social benefits for less cost by taking a catchment-wide view of opportunities to offset impacts'. Submissions to the assessment close on 13 November.

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=1687

Endangered and threatening processes

The NSW Fisheries Scientific Committee is proposing to list the seagrass *Posidonia australis* in Port Hacking, Botany Bay, Sydney Harbour, Pittwater, Brisbane Waters and Lake Macquarie as endangered; and to list human-caused climate change in NSW as a key threatening process.

<http://www.dpi.nsw.gov.au/fisheries/species-protection/fsc/proposed-determinations>

AUSTRALIAN NEWS

Native Fish Forum features aquatic innovations

The 2009 MDBA Native Fish Forum held in Albury on 1-2 September showcased native fish rehabilitation projects including carp separation cages, two-in-one fishways, weirs fitted with undershot gates, resnagging; and carp hotspots. The forum also highlighted the year's activities, including emergency responses to rescue six threatened species' populations following drought and the Victorian bushfires last summer; completion of most of the fishways under the 'Sea to Hume Dam' initiative, resnagging sections of the Murray River, and establishment of 10 demonstration reaches across the Basin.

<http://www.mdba.gov.au/system/files/Agenda-NFS-forum-2009.pdf>

Salt interception scheme will benefit Ramsar wetland

A \$30 million salt interception scheme to be built on the Murray River at Murtho near Renmark will stop an estimated 36,000 tonnes of salt entering the river each year and will boost the ecological health of the nearby Riverland Ramsar wetland site. The scheme will intercept saline groundwater flows and pipe it to Noora Disposal Basin. The scheme is expected to be running by 2012.

www.environment.gov.au/minister/wong/2009/mr20090903.html

Fishers being paid to catch carp

The SA government is paying fishers \$4.50 a kilo to catch carp in Lake Albert near the mouth of the Murray. The aim is to reduce fish numbers before rising salinity kills freshwater fish in the lake. The government has allocated \$500,000 for the two week trial, and if the catch rate is high, may continue payments after the trial.

<http://www.premier.sa.gov.au/news.php?id=5399&print=1>

Waterbird numbers, species and breeding all down

The 2008 survey of waterbird communities of The Living Murray icon sites found 48% fewer birds and fewer species at Barmah-Millewa, Hattah, River Murray, Lower Lakes and Coorong compared with 2007. Breeding declined across all icon sites in 2008 with only two species recorded breeding, white ibis and black swan.

www.mdba.gov.au/system/files/Aerial-Survey-of-Icon-sites-final-rpt-July09.pdf

Fish sit out aftermath of bushfires

The Victorian government is fish-sitting hundreds of endangered native fish until stream health improves in areas burnt in February's bushfires. 394 barred galaxias and 35 Macquarie perch are in safe refuges at Heidelberg and Snobs Creek protected from poor water quality in streams affected by ash and sediments. The nationally endangered barred galaxias is only known in 21 populations worldwide and exists in a small area of Victoria that has been severely damaged by fires in 2006 and 2009. Only a small number of fragmented populations of Macquarie perch now exist in Victoria and, prior to the fires, one population was being supported by the local community along King Parrot Creek between Kinglake and Strath Creek.

www.dse.vic.gov.au/ari

Saltmarshes feed estuarine fish

Analysis of 12 estuarine fish has found that all fed in saltmarsh areas, three almost exclusively on larvae released in high numbers by saltmarsh crabs. The diets of the other species comprised macroinvertebrates, crabs, insects and/or detritus. The study highlights the importance of saltmarsh in providing protection and abundant food resources for fish species, and the need to include saltmarsh in management plans for fish.

<http://www.publish.csiro.au/nid/126/paper/MF08164.htm>

Golden perch are flexible

Research into young golden perch (*Macquaria ambigua*) found in Menindee Lakes in 1997 has revealed that the fish spawned at lower temperatures ($\leq 18.8^{\circ}\text{C}$) than has previously been reported from Murray-Darling Basin. As well, spawning can occur without floods, and perch in Menindee Lakes can be derived from year round spawning in contrast to the more southerly locations of the Basin.

<http://www.royalsociety.org.nz/Site/publish/Journals/nzjmfr/2009/049.aspx>

River frontage and floodplain rehabilitation grants on offer

Grants for community projects aimed at protecting and rehabilitating frontages and floodplain areas along the Victorian side of the Murray River are available from the Mallee CMA. Grants are available for works and activities aimed at improving river health, including fencing, erosion control, pest plant control, revegetation, track rationalisation, litter removal, disused pump site rehabilitation, recreation management and cultural heritage protection works. To apply, or for more information, contact Ray de Groot at Mallee CMA on 03 5051 4350; or mobile 0428313177

<http://www.malleecma.vic.gov.au/index.php?id=15&PHPSESSID=fa9ca81e8114b569f68f3a8c3fb80987>

Cleanup benefits fish



These bottles were fish habitat until cleared from a boat ramp on the Mary River in Queensland in July. Volunteers from the Fraser Coast 4WD club and OceanWatch Australia met for an easy morning's cleanup, only to find 500 kilograms of bottles, and 980 kilograms of mixed rubbish including crabbing wire and mesh, hundreds of bait bags and plastic bags, fishing line, clothing, oil drums, 16 car tyres and household rubbish. The clean-up at Beaver Rocks is just one of a series of marine clean-ups that occurred in the Burnett-Mary region with help from commercial and recreational fishers. For more information, contact OceanWatch project manager Michelle Haase on 0401 890 069.

Oxley Creek wins national Riverprize

Queensland's Oxley Creek Community Association is this year's winner of the National Riverprize. The Oxley Creek is a tributary of the Brisbane River, and drains a catchment area of approximately 26,000 ha in the local government areas of Logan City and Brisbane City, and a small area of Ipswich City. The 2009 International Thiess Riverprize winner is California's Lake Simcoe Region Conservation Authority.

http://www.riverfoundation.org.au/index.php?option=com_content&task=view&id=27&Itemid=45

INTERNATIONAL NEWS

Riparian vegetation affects fish numbers

NZ researchers have found that fish numbers are directly related to the amount of vegetation on the streambanks. Removal of overhanging vegetation and in-stream wood changed stream structure, and reduced inanga to a quarter of their original numbers. Adult longfin eel became less abundant, and elvers more abundant. In another study, 10 years after riparian vegetation was restored and stock access removed from paddock streams, populations of giant kokopu and redfin bully had more than doubled, banded kokopu had slightly increased, and shortfin eel had decreased by about 40%. Riparian restoration was most effective for the fish species that use cover and pool habitat.

<http://www.royalsociety.org.nz/Site/publish/Journals/nzjmfr/2009/066.aspx>

Salmon return to the Seine's cleaner waters

After an absence of nearly a century, Atlantic salmon, a threatened species in Europe, have returned to France's Seine River. The migratory salmon return from the sea between December and June to their freshwater birth place to reproduce, but became extinct in the Seine after WWI due to construction of dams, and pollution from industry and agriculture. Massive efforts over the last 15 years, including a new water purification plant, have removed most of the pollutants. The results suggest that when it comes to conservation, restoring an ecosystem is probably a better strategy than restocking depleted waters.

<http://www.theage.com.au/executive-style/business-travel/salmon-fishing-in-the-seine-20090813-eizj.html>

\$167 million for US aquatic habitat projects

The US government has provided \$167 million for 50 aquatic habitat restoration projects as part of its move to restore the economy through green jobs. The projects will restore more than 8,900 acres of habitat, remove obsolete and unsafe dams to open more than 700 stream miles, remove more than 850 metric tons of debris, rebuild oyster and other shellfish habitat, and reduce threats to 11,750 acres of coral reefs.

http://www.noaanews.noaa.gov/stories2009/20090630_restoration.html

Millions of salmon vanish from Canadian river

Millions of sockeye salmon have disappeared from a river once known as the world's most fertile spawning ground for sockeye. Up to 10.6 million salmon were expected to return to spawn this summer on the Fraser River, but fewer than one million have returned. Among the theories put forward, climate change may have reduced food supply for salmon in the ocean, they may have been infected with sea lice en route to the Fraser River, or rising river temperatures may have weakened the fish. The Canadian Government believes the sockeye are dying off in the ocean, not in fresh water, based on healthy out-migrations.

http://www.abc.net.au/nature/news/NatureNews_2656194.htm

HABITAT RESOURCES

Freshwater research newsletter

Freshwater Research News is a free newsletter that brings recently-published research findings to a general audience. The newsletter contains brief summaries of the background and significance of research projects from around the world. The emphasis is on transferable ideas and applications, and on projects that highlight connections between physical and ecological processes. To subscribe, email Kev Warburton.

K.Warburton@ug.edu.au

WetlandCare Australia art competition 2010

WetlandCare Australia's national art and photography competition 2010 is now open for entries. The theme for this year's competition is Wetlands, biodiversity and climate change, reflecting the theme of World Wetlands Day 2010. Entry forms and information on the competition can be found on the WetlandCare Australia website or alternately contact Liz Hajenko on (02) 6681 6169.

www.wetlandcare.com.au

Creek to coast newsletter

Creek to Coast is produced by Great Lakes Council to keep people up to date with NRM activities region.

<http://www.greatlakes.local-e.nsw.gov.au/environment/1497/66851.html>

HABITAT DATES

**International river health conference, Canberra
18-21 October**
<http://www.onelifeoneworldourfuture.com/index.php?pageid=218>

**National water week
18-24 October**
<http://www.nationalwaterweek.org.au/>

**NSW coastal conference, Ballina,
3-6 November**
<http://www.coastalconference.com/>

**River restoration conference,
York UK
14-15 April 2010**
http://www.therrc.co.uk/rrc_conferences.php

**Australian Fish Biology, conference, Melbourne
12-14 July 2010**
<http://www.asfb.org.au/>

ABOUT I&I NSW AND FISH HABITAT

NSW DPI is responsible for management of, and research into, fish habitat in NSW.

On-ground activities

Map, priorities and modify structures that block fish passage
Map and rehabilitate aquatic habitat such as wetlands.
Reintroduce snags (large woody debris) into streams.
Revegetate streambanks to provide habitat and improve the quality of water running into streams.

Research activities

Document the fish communities associated with different aquatic habitats
Understand the basic biology of key fish species- what they eat,

when they breed, and their habitat requirements.

Evaluate management actions to see how effective they have been and what improvements may be possible.

Policy and planning activities

Review developments that may impact on fish habitats and negotiate impact reduction and/or compensatory works
Incorporate aquatic habitat protection requirements into land use planning, water management, and estuary and floodplain management.
Help developers, local councils and other state agencies understand the importance of aquatic habitats for fish and options for ensuring their protection and rehabilitation.

Aquatic habitat staff

Sydney (Cronulla) 02 9527 8411
Sydney (Wollstonecraft 02 8437 4909

Batemans Bay 02 4478 9103
Huskisson 02 4441 8969

Port Stephens 02 4982 1232
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Tamworth 02 6763 1100

Dubbo 02 6881 1270

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Research staff

Port Stephens 02 4982 1232

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Website

<http://www.dpi.nsw.gov.au/fisheries/habitat>

Subscribe to Newstreams

Newstreams is a free email newsletter available to anyone interested in fish habitat. To subscribe or send in your habitat news, email the editor, Rebecca Lines-Kelly.

rebecca.lines-kelly@industry.nsw.gov.au

Back issues

<http://www.dpi.nsw.gov.au/aboutus/resources/periodicals/newsletters/newstreams>