

## AUSTRALIAN NEWS

### National award for a bunch of mates

The 2015 Habitat Hero Award was presented to Matt Hansen and the fishers of the Inland Waterways Rejuvenation Association ([IWRA](#)) based in Dubbo, central western New South Wales. This 'bunch of mates' realised that stocking fish alone is not the answer to healthy fisheries. They started working to restore native fish habitat, focussing mainly on what would benefit the native fish of the Macquarie River. Using a combination of science, local knowledge, humour and lots of hard graft, Matt and his mates continue to raise serious money to support their habitat work – and have a lot of fun in the process.

Read more about these Habitat Heroes:

<http://www.dailyliberal.com.au/story/3236578/dubbo-fisherman-wins-habitat-hero-award/?cs=12>



The 2015 Habitat Heroes: IWRA members (left to right) Paul Mullen, David Harris, John Brouff and Matt Hansen, with Craig Copeland (back, right). Photo source: Daily Liberal.

### What lies beneath (1)

100metres beneath the surface of the sea off Wilsons Promontory, Victoria, researchers found an unexpected landscape, including boulders, ridges and caverns of sponges and hard and soft coral. Using underwater video cameras and a robotic vehicle, marine life was recorded in many of the deeper areas for the first time, including fish species considered rare to Victoria, such as Australian Barracuda and Longsnout Boarfish. More information:

<http://www.abc.net.au/news/2015-08-22/deepsea-robot-discovery-rivals-great-barrier-reef-parks-victoria/6717028>



The newly identified deep reef habitats are comparable to Australia's better-known tropical reef areas. Photo: Parks Victoria

### What lies beneath (2)

The first assessment of over 50km<sup>2</sup> of the Port Stephens estuary, on the NSW central coast, has identified previously undocumented macroalgae-dominated habitats and found strong correlations between various habitats and the depth at which they occur. The researchers suggest that depth may be a useful proxy for estuarine habitat types where specific data are lacking. More of this research by Davis, Harasti and Smith in *Marine and Freshwater Research*: <http://dx.doi.org/10.1071/MF15123>

## What fish see in the Darling

Taking advantage of dry weather, researchers have mapped fish habitat along 1100km of the Barwon – Darling Rivers between Walgett and Wilcannia in north-west New South Wales. The deep holes and shallows, snags and plant life, are all important for fish and were described and identified with GPS coordinates. In the stretch of the river mapped so far, the team found more than 36,500 snags and 1,900 refuge holes greater than 3.5 metres deep.

More: <https://freeflow.govspace.gov.au/2015/08/20/fishing-for-answers-in-the-north/#.VdV-2yGgqkp>

## The good news for Mackay region fish

Lagoons Creek, in Mackay, central Queensland, is, like so many waterways, choked with weeds. In this case, the weed is Para Grass and it is blocking fish access to upstream wetlands. The creek is used by 70 to 120mm sized juveniles of many species, including Barramundi, Sea Mullet, Mangrove Jack and Tarpon. An excavator removed the thick Para Grass, then placed 200 tonnes of boulders along the creek, thereby reinstating fish passage. The juvenile fish can now access the productive habitat upstream, where they will grow to 30 to 40cm before migrating back to the sea to spawn. More on this project:

<http://www.abc.net.au/news/2015-08-03/lagoons-creek-rehabilitation-gives-fish-new-hope-in-mackay/6668374#.VePkr-psQz8>



Large boulders were carefully laid in the rehabilitated Lagoons Creek to create tiered levels which slow water flow and will help fish migrate through the Creek. Photo: ABC QLD Country Hour.

## And the not so good ...

Nearly half of the fish species throughout the Mackay - Whitsunday region on the central coast of Queensland are affected by barriers to migration and movement. A recent review identified 3 973 fish passage barriers throughout the region. Barriers have significant impacts on recreationally and commercially important species, such as Barramundi, Mangrove Jack, Tarpon, Jungle Perch and Long-Finned Eel, as these fish migrate between the estuarine habitat and the sea. Freshwater areas are used as a nursery by many species as the habitat provides lots of food and cover for juveniles. The barriers are limiting these species from migrating and completing their lifecycles. The report identified the highest priority waterways for immediate fish passage works. To read more:

<http://www.dailymercury.com.au/news/barriers-pose-a-danger-to-migrant-fish/2731728/>

## And again further north

A total of 3 748 physical barriers to fish passage have also been identified in the Wet Tropics region, Far North Queensland. The barriers, including bridges, culverts and causeways, are a first step towards a complete barrier inventory. The report by Kroon and Phillips in *Marine and Freshwater Research*: <http://dx.doi.org/10.1071/MF14397>

## Mussels on the decline

The only freshwater mussel found in the south-west of the country, *Westralunio carteri*, has disappeared from nearly 50 per cent of its former range. Researchers compared field surveys to historical records and found that the species is no longer found in many areas where the water has become even slightly more saline. As well as the increased occurrence and severity of water salinity, resulting largely from land clearing, being trampled by livestock is also thought to have contributed to the decline. Individual mussels can live for 50 years and the research suggests that the loss of genetic diversity is likely to be significant. More:

<http://sciencewa.net.au/topics/fisheries-a-water/item/3657-long-lived-mussels-disappear-from-half-their-range#k2Container>

## School is in for Southern Pygmy Perch

Five Southern Pygmy Perch are now observing lessons from a tank in the classroom in Holbrook Public School, southern New South Wales. These small fish are a threatened species, but are found in some creeks around the area. The captive-bred fish are part of a larger project, which is improving the habitat for these fish in Coppabella Creek and the Upper Billabong Creek where they still occur naturally. The tank is set up to mimic the natural habitat these fish prefer, including snags and in-stream vegetation.

More: <http://murray.ils.nsw.gov.au/resource-hub/media-releases/2015/new-life-for-native-fish-at-holbrook-school>



Luke Pearce (left) with students and teachers from Holbrook Public School helping the Southern Pygmy Perch settle in. Photo: Easternriverinachronicle.com.au.

## Estuaries good for Grunters

Researchers in Western Australia have used individually-aged fish to track how the Western Striped Grunter's use of different habitats varies with time of the year and life stage. They found that growth peaks in the summer, a time of better food supply and warmer waters, and that the migration behaviour between coastal and estuarine habitats changes with age. The species spawns from October to February and spends the first year of life in near-shore or estuarine seagrass meadows before it migrates into deeper coastal waters with sparser seagrass to mature. The fish move back into the estuary soon after maturing in mid-summer. The fish from the estuary were all less than 4 years old, whereas those caught in coastal habitats were up to 10 years old. This highlights the importance of the estuary as a nursery for this species. More information in summary: <http://sciencewa.net.au/topics/fisheries-a-water/item/3636-grunter-s-life-choices-chronicled-in-fisheries-study#k2Container> More on the research by Veale and others in *Marine and Freshwater Research*: <http://dx.doi.org/10.1071/MF14079>



The growth of Western Striped Grunter in the estuary was seasonal but peaked earlier and was greater than in marine waters. Photo: ScienceWA.net.au.

## Accommodation sector set to boom

They call them LUNKERS around Dalby, in southern Queensland – “Little Underwater Neighbourhood Keepers”, better known as fish habitat structures. 53 have been installed in Myall Creek along a stretch that has been eroding gradually. With the last two floods increasing this damage, the LUNKERS, which mimic the natural undercutting of a riverbank and work to slow water velocity, help combat the erosion as well as giving native fish shelter. Revegetation works along the bank are also improving both the erosion control and the habitat for fish.

More: <http://www.condaminealliance.com.au/#!news-aquatic-accommodation-sector-set-t/cni9>

The installed LUNKERS mimic naturally undercut banks. Photo: Condamine Alliance



## What to do when Catfish are a pest

Unlike in the eastern State's, in Western Australia Eel-tailed Catfish are an introduced pest. A successful removal program, coupled with *Salvinia* control, is helping native fish in Lake Marmion, in the State's south-west. The Catfish were also shown to be carrying Redspot disease, increasing their impact on local fish. Native Western Pygmy Perch and Western Minnow have been restocked into the Lake to kick start the process of rebuilding the fish population. More: <http://www.fish.wa.gov.au/About-Us/Media-releases/Pages/Pilot-project-finds-safe-home-for-native-fish.aspx>



## Estuary Perch are back

An Estuary Perch has travelled 300km upstream of the estuary in the Glenelg River, Victoria. This is the third time monitoring surveys have found big Estuary Perch in the area around Harrow, an area from which they had disappeared after the construction of nearby Rocklands Reservoir in the 1950s. The fish appear to be taking advantage of the removal of barriers to fish passage, an increase in environmental flows and work by local landholders to improve river health. Other native fish caught during the survey include three species of Pygmy Perch, Blackfish and Tupong. For more information: <http://www.ghcma.vic.gov.au/news/article/glenelg-river-marathon-for-estuary-perch>



Estuary Perch are now able to travel the 300km journey from the estuary to Clunies Hole. Photo: Glenelg Hopkins CMA.

## Feral Carp take advantage

The wild form of European Carp is listed as Vulnerable on the IUCN Red List, yet the feral form of the same species is a destructive pest. While the two forms are the same species, it is recognised that they differ in key aspects of their ability to adapt their lifecycles: for example, the feral form has a greater flexibility in relation to spawning. Researchers surveyed feral Carp in the Murrumbidgee Irrigation Area, in NSW, to identify what substrates Carp would take advantage of when spawning. Included among a range of natural and artificial surfaces, they found the fish would spawn successfully on stony substrates, something previously thought not to occur. The researchers identify the potential for irrigation waterways to provide more opportunities for Carp spawning that previously thought. For more on this research by Adámek and others in *Fisheries Management and Ecology*: <http://dx.doi.org/10.1111/fme.12123>

## Say hello to the 'Great Southern Reef'

The 'Great Southern Reef' (GSR) is the name being given by scientists to the 71 000km<sup>2</sup> temperate reef system, straddling five states across the southern coastline, from Brisbane to Perth. Kelp forests form a major part of the GSR, found off over 8 000km of Australia's temperate coastline, yet are largely unknown to most people. A review of the ecological, social and economic importance of these areas estimates that in regional coastal communities alone, tourism expenditure from the GSR, including reef-related tourism such as fishing, scuba diving, surfing and whale watching, was estimated at around \$9.8 billion per year. The GSR is relatively healthy compared to reefs elsewhere in the world, however it is under growing pressures from climate change, population growth and urban development. Many areas of the reef are already showing severe signs of stress and degradation. Read a summary <http://theconversation.com/australias-other-reef-is-worth-more-than-10-billion-a-year-but-have-you-heard-of-it-45600> or more of the review by Bennett and others in *Marine and Freshwater Research*: <http://dx.doi.org/10.1071/MF15232> [Open access]



Kelp forests are the 'biological engine' of the GSR, producing as much as 65 tonnes of biomass per hectare per year. Photo: Left: Adelaide.edu.au; Right: T Weinberg.

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## INTERNATIONAL NEWS

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### When poison works for fish

As the last glaciers retreated from North America, Arctic Char adapted to a freshwater life cycle. This species was once not rare but now survives in only a dozen ponds in northern Maine. Facing extinction in one of the most important refuges, known as 'Big Reed', the decision was made to use the fish poison rotenone to eliminate invasive fish species and give the Arctic char a chance to recolonise. In the three years preceding treatment only about a dozen of these fish were captured but they formed the basis of a conservation breeding program. The resulting fry, along with that of Big Reed's native Brook Trout, were restocked in Spring following the treatment. The Brook Trout population, which had also declined significantly, has exploded. The Arctic Char are now mature and thriving, but it appears their much longer life cycle means that they have not yet spawned. This is not the only example of the use of rotenone in fisheries management and it is not without controversy. For more on this and other stories about the use of rotenone: <http://blog.nature.org/science/2015/08/19/recovery-the-return-of-native-fish-victims-of-bucket-biology/>



The Arctic Char: a relic species helped by the use of rotenone. Photo: Maine Dept Inland Fisheries and Wildlife.

### UK Government being held to account

The High Court in the United Kingdom has granted permission for UK Government agencies to be taken to court over their failure to protect some of England's most important rivers, lakes and coastal areas from agricultural pollution. The focus of the court case is on habitats that the UK government is required by law to protect and to ensure they are in good health. The December 2015 deadline to achieve this appears unlikely to be met as current actions are thought to be insufficient to tackle the scale of the problem. The health of the rivers and lakes concerned is vital for important species such as Atlantic Salmon and other fish, and also supports local economies. Pollution from poor land management is seen as the core problem. If the court action is successful, and the Government's actions are found to be unlawful, the Government will have to identify the regulatory steps necessary to tackle pollution affecting these areas. To follow this story: <http://www.anglingtrust.net/news.asp?section=29&sectionTitle=Angling+Trust+News&from=2015/8/01&to=2015/09/01&itemid=2724>

### Taking the polluters to court

Fish Legal, based in the United Kingdom, has started legal proceedings against a farm insurance company, claiming compensation for its member club Grantham Angling Association. The claim is based on an event in which a farmer polluted the river Witham, near Grantham, with approximately 6,000 litres of liquid fertiliser, killing at least a thousand fish. To follow this story: <http://emarketing.blue-leaf.co.uk/tr-l-fittyt-dyydhdydt-yk/>

### Fish on the highway

Two more rivers in Yorkshire, northern England, are now available for fish migration for the first time since the Industrial Revolution. Weirs have been removed on the River Don in Sheffield and on the River Aire in Leeds. Both these rivers had similar characteristics in that they were deep, wide and slow flowing behind the weir. This slow water contributed to the smothering of the gravel beds many fish need to spawn. Both rivers are now returning to a natural series of shallow, fast sections separated by deeper pools, providing better habitat for the Grayling and Brown Trout that live there and for the invertebrates they feed on. More information: <https://environmentagency.blog.gov.uk/2015/06/22/putting-fish-on-the-highway-to-success/>

## Faster water helps Eels

The European eel has suffered a dramatic decline over recent decades and the number of juvenile fish returning to rivers down by over 90 per cent. One of the key factors contributing to this decline is river infrastructure, such as hydropower stations. Because of their long bodies, eels that enter turbine intakes are likely to be struck by the rotating blades, causing physical injury and high rates of mortality. Researchers have found that the higher the water velocity entering the intake, the more likely the eels are to avoid the structure. Under normal water velocity, when the eels encountered the constricted flows of the intake, 'search' behaviour was common prior to coming into physical contact with structures. However, under high water velocity gradients, the eels swam in the opposite direction to escape rapidly back upstream. More on this research by Piper and others in the *Proceedings of the Royal Society B*: <http://www.sciencedaily.com/releases/2015/07/150702073933.htm>



An avoidance path taken by an Eel moving downstream approaching the hydropower intake. Credit: University of Southampton

## Tides and salinity the key for nurseries

The juveniles of many fish species rely on mangroves and seagrass habitats for protection and food but how susceptible particular species are to changes in these habitats was not known. Better understanding of how juveniles used different habitats would help identify issues with the degradation of coastal habitats. Researchers looked at tropical coastal ecosystems around the world and found differences in the use of mangroves, seagrass and coral reef habitats between the Caribbean and the Indo-Pacific. In the Caribbean, for example, more juveniles were found in mangroves than in seagrass. Seagrass was more important in the Indo-Pacific. However, it appears that the size of the tides is a critical factor regardless of the biogeographic region. Also, higher water salinity led juvenile reef fish to make greater use of mangroves. The researchers argue that as water salinity and tidal access appear to drive how juvenile fish use estuarine and near-shore habitats, changes in sea level and rainfall due to climate change may have important effects on these species. More of this research by Igulu and others in *Plos One*: <http://dx.doi.org/10.1371/journal.pone.0114715>

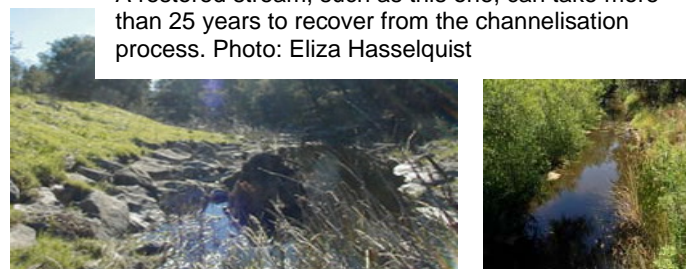
## Riparian recovery takes time

Researchers in Sweden have studied the recovery of riparian areas of streams that were channelized for timber floating and have found that it takes about 25 years for an area to return to a natural state. In one area, both the main channel and most tributary streams were channelized from the 1850s to the 1950s and boulders in the streams were blasted or pushed to the sides of the stream creating levees that disconnected the stream from the riparian zone. Restoration efforts started in the 1980s, mainly to benefit fish productivity. The slow rate of recovery of the riparian areas is also thought to reflect the current practice of relying on natural re-seeding rather than seeding and planting native plants. For more of this research by Hasselquist and others in *Ecological Applications*: <http://www.sciencedaily.com/releases/2015/06/150630100659.htm>



A restored stream, such as this one, can take more than 25 years to recover from the channelisation process. Photo: Eliza Hasselquist

## From little things ...



20 years later: before (left) and after (right) rehabilitation works on Brush Creek. Photo: NOAA



In 1996, the first of NOAA's Community-Based Restoration Program pilot projects got underway in Santa Rosa, California. The project – to restore Brush Creek which flowed through a highly urbanized area, involved school children planting 2,000 trees along 1.5 miles (2.3kms). The trees provided shade for Steelhead and stabilized the creek banks. By creating areas with lower flow, part of the creek was returned to a more natural condition and provided resting areas for adult fish as well as hiding places for juveniles. Read more:

<http://www.habitat.noaa.gov/highlights/celebratinghabitatsuccesses.html>

## Benefits from improving road crossings not showing up ...

Researchers looked at the response by cold water fish and macroinvertebrates to improved stream flow as a result of replacing poor road crossings with fish-friendly structures. Using 2 to 4 years' data from before the works and 3 to 5 years' data from after, they found no significant improvement in either fish or macroinvertebrate communities. They note that it appears that the restoration of stream ecosystems and natural flow regimes may not lead to a restored fish community, at least in the relatively short time-frames studied. Read more about this research by Ogren and Huskins in *Restoration Ecology*: <http://dx.doi.org/10.1111/rec.12250>

## But the benefits of in-stream rehabilitation are

A review of the monitoring results published for river restoration projects found the restoration of instream habitat had significant effects on fish and macroinvertebrates. The review also identified that restoration had a higher effect on abundance and biomass compared to richness and diversity: in other words, for example, there was likely to be more fish but not new species of fish. The reviewers note that the results were highly variable, indicating adaptive approaches that took each project site's land-use and ecosystem context into account were needed. For more about this study by Kail and others in *Ecological Indicators*: : <http://dx.doi.org/10.1016/j.ecolind.2015.06.011>

## A barrier no more for Brook Trout

An excavator has turned an impassable waterfall and a century old dam into free passage for Brook Trout. Within minutes, a small fish was seen to be taking advantage of the newly available access to 34 miles of upstream habitat. The dam, on the Wells River, was one of hundreds within the Connecticut River watershed, Vermont, USA. The immediate benefit of removing the dam is that the fish can now access colder headwaters where they can beat the summer heat. The river can now also flow into a floodplain downstream, something the dam had prevented, opening up more habitat for fish. More on this story:

<http://news10.com/ap/removal-of-groton-dam-opens-wells-river-to-fish-and-flood/>



The dam, built in 1909 and unused since 1927, is no longer a barrier for Brook Trout. Photo: digital.vpr.net

## The return of the Lamprey

Lamprey are ancient fish and have recently been seen in British rivers, including the Ouse, Trent and Derwent Rivers, for the first time in 200 years. The species largely disappeared after the rise in pollution associated with the Industrial Revolution, however habitat rehabilitation work, including removing weirs, installing fishways and improving water quality, have led to the Lamprey's return. For more information: <http://www.skynews.com.au/culture/offbeat/2015/09/05/fish-that-killed-king--back-in-uk-rivers.html>



Lamprey were once regarded as a luxury food, and popular legend has it that King Henry I of England, who was known for his love of the taste of lamprey, died by eating too many of them. Photo: skynews.com.au

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## RESOURCES

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### **Podcast: Recovering historic oyster reefs**

Around 150 years ago oyster reefs lined the South Australian coastline, improving water quality, clarity and fish life. Unfortunately, the reefs were harvested to extinction. Professor Sean Connell, a marine biologist from the University of Adelaide, spoke with Radio Adelaide about the oyster reef project. <http://blogs.adelaide.edu.au/environment/2015/07/29/podcast-recovering-historic-oyster-reefs/>

### ***State of the Trout***

Trout Unlimited has released their first ever State of the Trout report. This report describes the many and varied threats facing native and wild trout in the United States as well as describing major success stories towards monitoring and improving the status of these fish. <http://bit.ly/1LSVGZI>

### **Water movement through the Pumicestone catchment**

This animation shows how water moves within and through the Pumicestone catchment, illustrating the areas that affect water movement.

<http://qld.us3.list-manage2.com/track/click?u=41e197ab7d130dceb4e462565&id=35f8375307&e=c09eb12402>

### **Crucian Conservation**

The National Crucian Conservation Project, based in the United Kingdom, have produced a video to encourage angling clubs and fishery owners to create Crucian friendly waters in order to protect the species. <http://emarketing.blue-leaf.co.uk/t/r-l-fittytt-dyydhdydt-yd/>



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## ABOUT NEWSTREAMS

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*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>.

*Newstreams* is supported by funds from the NSW Recreational Fishing Trust, raised from the NSW Recreational Fishing Fee.

*Newstreams* is published electronically every three months by the Aquatic Habitat Rehabilitation Unit within Fisheries NSW on behalf of the Fish Habitat Network, a partnership of organisations working on fish habitat and a network of fishers engaged in fish habitat issues.



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Primary Industries



### Website

[www.fishhabitatnetwork.com.au](http://www.fishhabitatnetwork.com.au)

### Facebook

[www.facebook.com/fishhabitatnetwork](http://www.facebook.com/fishhabitatnetwork)

### 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](http://www.ansansw.com.au)

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

Ecofishers [www.ecofishers.com](http://www.ecofishers.com)

Fisheries NSW [www.dpi.nsw.gov.au/fisheries/habitat](http://www.dpi.nsw.gov.au/fisheries/habitat)

Fisheries Victoria [www.dpi.vic.gov.au/fisheries](http://www.dpi.vic.gov.au/fisheries)

Freshwater Fishing & Stocking Association of Queensland (FFSAQ) [www.ffa.com.au](http://www.ffa.com.au)

NSW Council of Freshwater Anglers [www.freshwateranglers.com.au](http://www.freshwateranglers.com.au)

NSW Fishing Clubs Association [www.nswfca.com.au](http://www.nswfca.com.au)

PIRSA Fisheries and Aquaculture [www.pir.sa.gov.au/fisheries](http://www.pir.sa.gov.au/fisheries)

Recfish Australia <http://recfishaustralia.org.au/>

RecfishSA [www.recfishsa.com.au](http://www.recfishsa.com.au)

RecfishWest [www.recfishwest.org.au](http://www.recfishwest.org.au)

Recreational Fishing Alliance of NSW [www.rfansw.com.au](http://www.rfansw.com.au)

SUNFISH [www.sunfishqld.com.au](http://www.sunfishqld.com.au)

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

Victorian Department of Environment and Primary Industries [www.depi.vic.gov.au](http://www.depi.vic.gov.au)

VRFish [www.vrfish.com.au](http://www.vrfish.com.au)

Western Australia Department of Fisheries: [www.fish.wa.gov.au/Pages/Home.aspx](http://www.fish.wa.gov.au/Pages/Home.aspx)