

Ramsar wetlands support threatened species and communities

If you care about threatened species, you care about wetlands

Gregory Andrews, Threatened Species Commissioner, Australian Department of the Environment

In the driest inhabited continent on earth, where there is water, life abounds. Wetlands feed and shelter some of Australia's rarest and most vulnerable plants, animals and ecosystems.

Needless to say, I care about wetlands. A year ago (August 2014), I was appointed as Australia's first Threatened Species Commissioner within the Australian Department of the Environment. The job brings a new national focus to efforts to conserve our threatened native plants and animals. That means raising awareness of what we stand to lose, brokering new partnerships and mobilising resources for flora and fauna at risk.

Last month (July 2015), this new national focus culminated in a landmark [Threatened Species Summit](#) and the release of a Threatened Species Strategy with hard and measurable targets for the conservation of

species on the brink. We now have a policy framework to guide our investment in threatened species at a national level. Areas of high biodiversity, such as wetlands, are a priority for us. Conservation actions that benefit multiple species are another. So too are those that engage the community in threatened species protection.

Here's an example of that approach in action. Earlier this year, the Australian Government announced it would spend \$35,200 to help restore coastal saltmarsh on Snake Island, within the Port Phillip (Western Shoreline) and Bellarine Peninsula Ramsar site in Victoria. This area of threatened temperate coastal



Threatened Species Commissioner, Gregory Andrews, with the Australian Department of the Environment

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The threatened fairy tern (Sternula nereis) (© Copyright, Georgina Steytler)

saltmarsh near Geelong is not only important in its own right, but also as nursery habitat for fish and feeding grounds for migratory shorebirds, including the vulnerable fairy tern (*Sternula nereis*).

Community monitoring has revealed that Snake Island has lost up to 90 per cent of its 15 000 shorebirds. This is mostly due to a simple issue - a damaged culvert that has interrupted water supply and led to toxic acid-sulphate soils and damage to habitat. Our funding of this threatened species project will help repair the culvert and reinstate those much needed flows.

We're lucky to have the help of Birdlife Australia, the Victorian Department of the Environment and Primary Industries, Corangamite Catchment Management Authority, Arthur Rylah Institute and Geelong Field Naturalists Club Inc on this project. We're lucky that organisations and community groups like these care about wetlands too, and we're willing to back their efforts to save them.

Learn more about the work of the Threatened Species Commissioner and the Department's work on threatened species here:

<http://www.environment.gov.au/biodiversity/threatened/commissioner>



*Temperate coastal saltmarsh, listed nationally as a
vulnerable ecological community* (© Copyright, Matt White,
Australian Department of the Environment)

Bitterns and rice: still on the conservation menu

Matthew Herring (Murray Wildlife), Neil Bull (Ricegrowers' Association of Australia), Andrew Silcocks (Birdlife Australia), Mark Robb, (Coleambally Irrigation), Wayne Robinson (Charles Sturt University) and Inka Veltheim (Federation University)

Australian rice crops support the largest known breeding population of the globally endangered Australasian bittern (*Botaurus poiciloptilus*), and they're home to other threatened species too. These agricultural wetlands now form part of a network of important habitats for some of our most threatened species.

Thanks to funding from Riverina Local Land Services, we've recently completed the surveys for our third rice-growing season, and it's our best sample yet. We had 80 sites covering 2050 hectares of rice on 41 randomly selected farms.

We have much analysis ahead, but it's already clear that in most years, 500-1000 bitterns descend on the rice crops of the New South Wales Riverina. That's around one quarter or one third of the global total. This year, we found eight nests, all from randomly selected rice farms, indicating widespread breeding. Importantly, we were also able to confirm successful breeding, with fully-fledged young.

Late in April, we were able to get our first bittern away with a satellite transmitter and begin discovering the network of non-breeding wetlands they use after harvest. Affectionately known as 'Robbie', the journey of this young male has been captivating.

He flew 557 kilometres, crossed two state borders and chose the recently restored Pick Swamp in South Australia, which forms part of the Piccaninnie Ponds Karst Wetlands Ramsar site. After a few days, he began

moving along the coast back into Victoria. He used habitat around the mouth of the Glenelg River, and then continued on to Long Swamp. Here, Nature Glenelg Trust has been undertaking some innovative wetland restoration trials. They think he has fine taste in wetlands and is a good endorsement for restoring them.

As a threatened species, the Australasian bittern is not alone in its use of Riverina rice fields. Remarkable numbers (hundreds) of Australian painted snipe (*Rostratula australis*) used rice during the 2012-2013 season. Equally surprising was the discovery of eastern grass owls (*Tyto longimembris*) roosting in rice during the 2013-2014 season, while the southern bell frog (*Litoria raniformis*) populations around Coleambally and in the western Murray Valley are among the largest known for the species.

For more information about the *Bitterns in Rice Project* and to follow the journey of Robbie and other bitterns in the future, check out our new website: www.bitternsinrice.com.au



This bittern chick was one of nine from three nests in adjacent rice bays, each with a female, but only one booming male, confirming polygamy (© Copyright, Matt Herring)



The journey of 'Robbie', a 3-4 month old rice-bred Coleambally male, to the South Australian coast
(© Copyright, Matt Herring)

*Australian rice crops support the largest known breeding
population of the endangered Australasian bittern
(*Botaurus poiciloptilus*)* (© Copyright, Matt Herring)



Freedom for the Frecklies

Grace Bourke, Hunter Wetlands Centre Australia

In a world first, the Hunter Wetlands Centre Australia, a community-owned environmental organisation, is proposing to release freckled ducks (*Stictonetta naevosa*) from our conservation breeding program and track them using satellite technology.

Located near Newcastle in the Hunter Estuary of New South Wales, the Hunter Wetlands Centre Australia is a Ramsar listed wetland of international importance. In addition to providing significant waterbird habitat to over 67 species, including the endangered Australasian bittern (*Botaurus poiciloptilus*) and the vulnerable magpie goose (*Anseranas semipalmata*), it serves as a breeding rookery and a welcome refuge for migratory bird species, especially during droughts.

Since commencing the program in 1993, the Hunter Wetlands Centre has been one of the world's most successful captive breeders of the vulnerable freckled duck. Freckled ducks are a wetland dependent waterfowl that nest in densely vegetated, inland Australian *wetlands*. They are adapted to the erratic fluctuations of water distribution, often seeking coastal refuges, such as the Hunter Estuary, in times of drought. The freckled duck is threatened from draining and clearing of vital wetland habitat, alterations to natural water flows as well as illegal shooting.

The freckled duck conservation breeding program was originally established to conserve the future of one of Australia's rarest ducks. Our largely volunteer-run program currently boasts a thriving population of 32 "Frecklies".

After years of deliberation, we have finally decided to fulfil the last stage of the program and release some of our un-imprinted freckled ducks back into the wild. The inaugural release, scheduled for autumn 2016, will launch our annual plan to release healthy juveniles, while also maintaining a viable breeding population on site.





Our freckled ducks (Stictonetta naevosa) making waves in their purpose built tepees at the Hunter Wetland Centre Australia (© Copyright, Grace Bourke)

But where will they go?

Freckled ducks, dispersive and nomadic by nature, may migrate thousands of kilometres in search of greener pastures. Based on expert advice and comprehensive research, we have decided that our best choice for monitoring their dispersal is the highly regarded but expensive satellite transmitter technology. This will allow individual birds to be tracked in real time, providing novel information on the distribution patterns and habitat use of the freckled duck.

The Hunter Wetlands Centre's ambitious *Freedom for the Frecklies* project, subject to funding and approval, will be a valuable contribution to the conservation management of this rare and vulnerable wetland dependent species.

For further information on the *Freedom for the Frecklies* project, please visit www.wetlands.org.au, email projects@wetlands.org.au or phone 02 49516466.

*Walking to Freedom? An inquisitive male freckled duck
(Stictonetta naevosa) coyly approaches at the Hunter
Wetlands Centre Australia. The base of the male's
bill turns crimson during breeding season*

(© Copyright, Gary Williams)



Discovering the secret life of microbialites in the Peel-Yalgorup System Ramsar wetland in Western Australia

Dr Michael Coote (Western Australian Department of Parks and Wildlife), Assoc. Prof. Ryan Vogwill (University of Western Australia), Mike Whitehead (Independent ecologist) and Jill Pryde (Western Australian Department of Parks and Wildlife)

These microbial communities do not swim, run or fly, they don't flower or shoot, but they have a character that is unique and their biology and chemistry have excited research groups around the world for decades.

Microbialites have been forming for thousands of years along the shores of the Yalgorup Lakes, in the Peel-Yalgorup System Ramsar site on the west coast of Western Australia. The microbialite community in Lake Clifton has been the subject of research since the early 1980s and recent investigations by independent researcher Mike Whitehead, and Ryan Vogwill from the University of Western Australia, are starting to unravel the geochemical and hydrological drivers that are responsible for the formation of these ancient limestone structures.

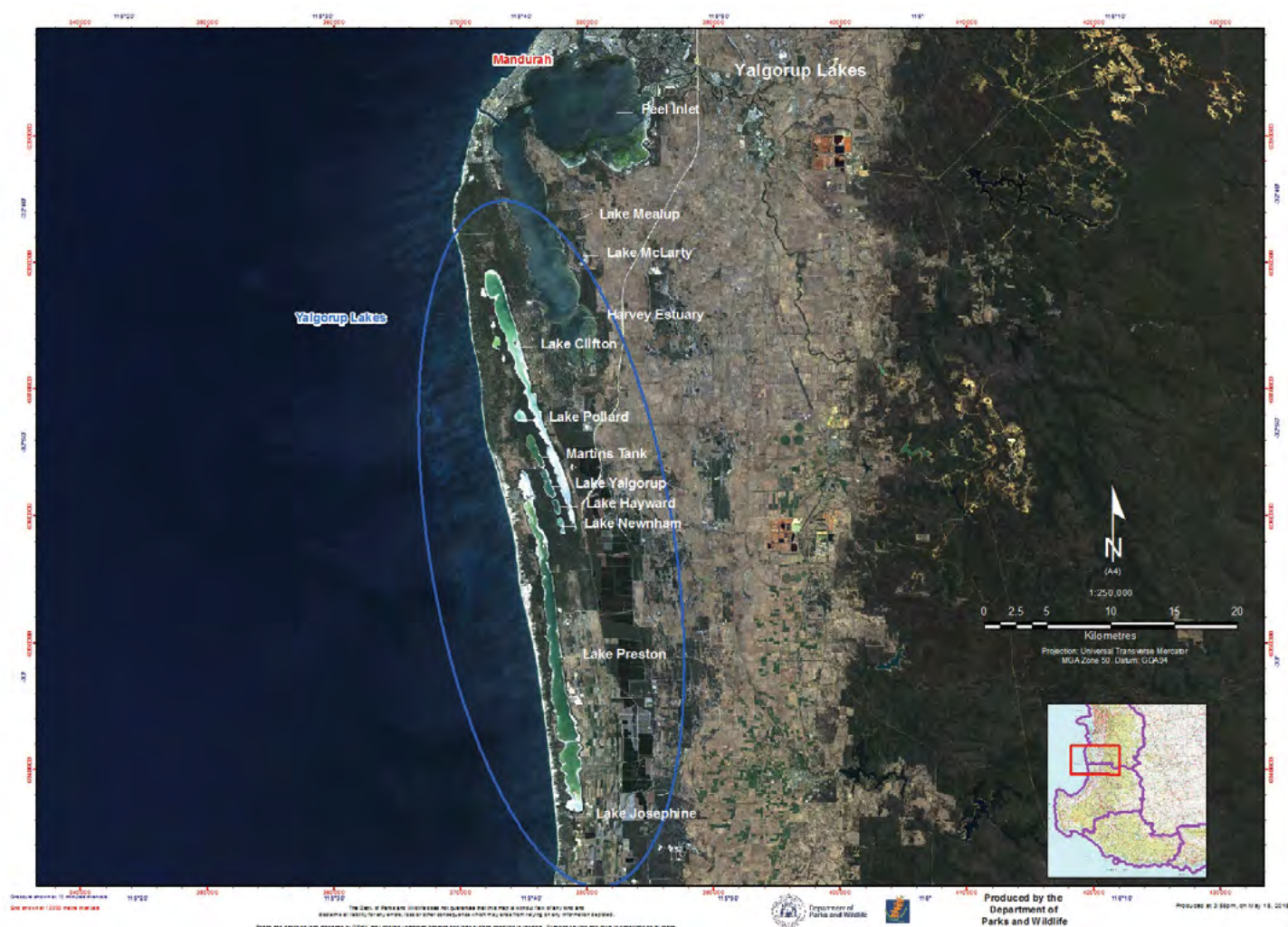
The microbial community at Lake Clifton has developed since the isolation of the lake from the ocean during the Holocene. The microbialites demonstrate variation in their structures, ranging from symmetrical domes to linear tent-like (tepee) structures and have been found along the shores of another of the Yalgorup Lakes, called Lake Preston, also in the Peel-Yalgorup System Ramsar site. Much of the historical research has associated the formation of these structures solely with the microbial communities that reside on the outer surface. The current research demonstrates that a set



The microbialite community at Lake Clifton, part of the Peel-Yalgorup System Ramsar site on the west coast of Western Australia (© Copyright, Michael Coote)



Researchers examining the microbial community structure, showing the lamina of bacterial communities that make up the limestone structures (© Copyright, Michael Coote)



Location of Yalgorup Lakes in The Yalgorup National Park where the microbialite community exists, 100 kilometres south of Perth on the west coast of Western Australia (© Copyright, Michael Coote)

sequence of naturally occurring geochemical, biological and hydrological processes involving the whole habitat are implicated in the formation process with even the historic geomorphology of the habitat type playing a role.

Although there is evidence of active microbialite formation in some Yalgorup Lakes, all the lakes are under significant pressure from anthropogenic stressors in the setting of a drying climate. Urgent research is required to unravel the connection between changes in climate, local groundwater use, land use and the ecohydrology of the Yalgorup Lakes to ensure protection of this vital biodiversity asset.

The microbialite community at Lake Clifton is listed as a critically endangered ecological community under the Commonwealth's *Environment Protection and Biodiversity Conservation Act (1999)*. The Department of Parks and Wildlife in Western

Australia coordinate the preparation and implementation of recovery plans in consultation with recovery teams which are established to oversee the conservation and recovery of threatened and priority ecological communities. The Lake Clifton Recovery Team brings together conservation managers, scientists, land managers, local government, community organisations and individuals, who recommend the best ways to manage threats and recovery of the threatened microbialites of Lake Clifton and other microbial communities in south-west Western Australia.

For more information on the Yalgorup Lakes microbialite community, please visit:
<http://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/wa-s-threatened-ecological-communities/127-wa-microbialite-research>

Building fences and strong partnerships to protect vulnerable saltmarsh in the Moreton Bay Ramsar site

Cheryl Bolzenius (WetlandCare Australia) and Jock Mackenzie (TropWATER, James Cook University)

A community-based monitoring program in south-east Queensland is helping to inform effective rehabilitation of vulnerable saltmarsh ecosystems.

Since 2012, WetlandCare Australia has been working with the Moreton Bay Regional Council, scientists from James Cook University (JCU) MangroveWatch and community volunteers from the Redcliffe Environmental Forum (REF) to rehabilitate approximately two hectares of coastal saltmarsh located in a Council reserve at Hays Inlet Conservation Park, part of the Moreton Bay Ramsar site.

Subtropical and temperate coastal saltmarsh is a threatened ecological community, listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act (1999)*. Saltmarshes, whilst dominated by a low diversity of plant species, are highly productive and perform a wide range of ecosystem services. They provide essential habitat for species such as crabs, snails, birds, fish and mammals



Partnerships between communities, land managers and scientists are helping to restore saltmarsh communities at Hays Inlet in south-east Queensland (© Copyright, WetlandCare Australia)

and contribute to fisheries productivity. Acting as a buffer and filtering system for sediments and nutrients, they improve the quality of water entering nearby waterways. Saltmarsh ecosystems are increasingly recognised as sites of high carbon storage and sequestration, playing an important role in mitigating climate change.

The Hays Inlet reserve has historically been impacted by recreational use, vehicles and hydrological change, leading to a loss of vegetation, increased erosion and reduced habitat function. Threats to the biodiversity values of the reserve include invasive weed species, feral pests, uncontrolled domestic animals, litter and vandalism. These impacts reduce ecosystem service capacity and increase vulnerability to climate change.

A community-based monitoring program using a Beyond-BACI (Before, After, Control, Impact) design has been in place since 2012 to inform and monitor site rehabilitation success, with REF volunteers contributing over 500 monitoring hours. Scientists from JCU MangroveWatch have been instrumental in the implementation of monitoring methodology and continue supporting volunteers with training and data analysis.

Rehabilitation works have considered the requirements of Council and Energex (SEQ electricity provider) for their continued management and maintenance activities at the reserve, such as ensuring vehicle access is retained in nominated areas. Works to date include topographic surveys, construction of fencing around approximately two thirds of the saltmarsh vegetation to restrict access, weed control, and revegetation in adjacent bushland, improving the buffer around the saltmarsh.

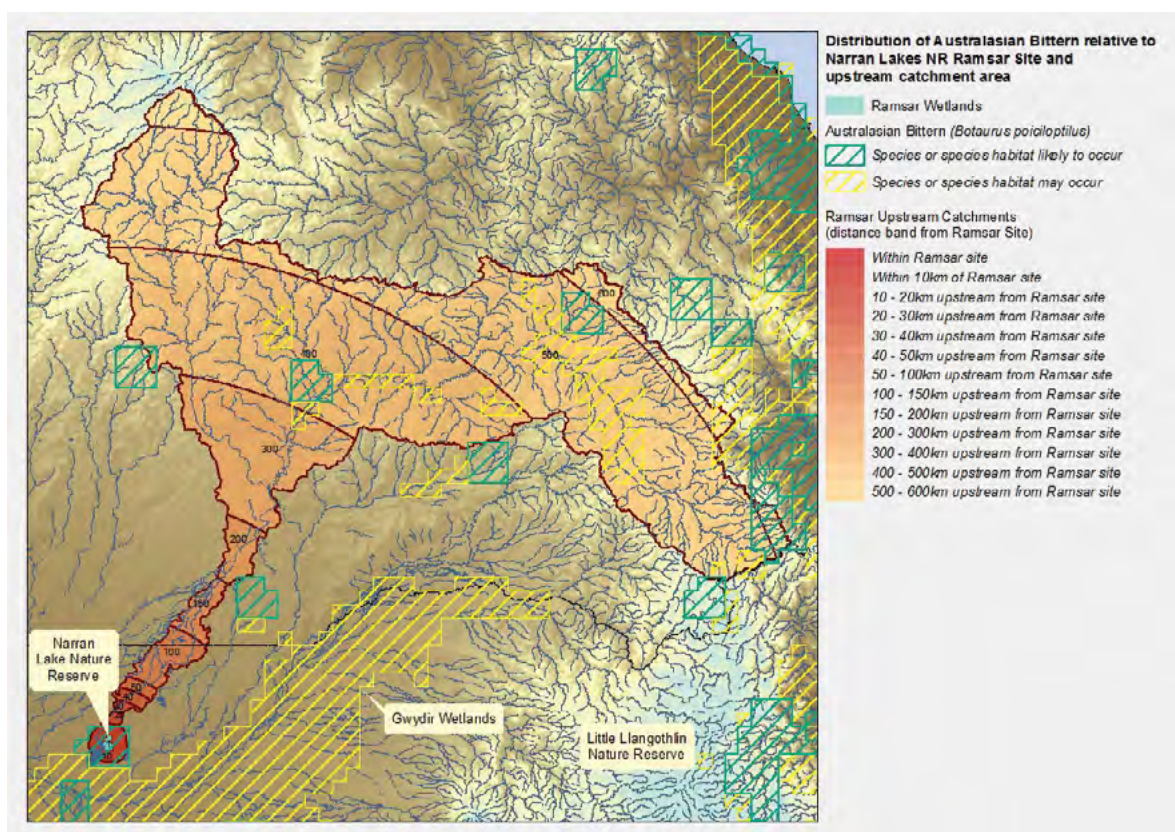
Fauna surveys show the reserve provides valuable ecological function for various fish species, crustaceans, molluscs and birds. Data analysis indicates signs of recovery and increased vegetation cover within the fenced area, however, this is offset by continued negative impacts on the unfenced area where vehicle impacts are now more concentrated. Continued monitoring is essential to determine the success of rehabilitation efforts and to enable alternative solutions to be found.

This program is an example of the benefits of developing community-management-science partnerships to inform effective rehabilitation of vulnerable saltmarsh ecosystems.

Spatial data available for matters of national environmental significance

Australian Government Department of the Environment

New open licensing arrangements for environmental spatial data are helping to improve public access to information on matters of national environmental significance, including wetlands and threatened species.



New open licensing arrangements allows users to obtain environmental data on specific catchments, including catchments containing Ramsar wetlands and threatened species (© Copyright, Australian Government Department of the Environment)

The Australian Government has adopted a default position of openly releasing spatial data for each of the 'matters of national environmental significance' that are protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Spatial data can be used for mapping and analysis in either Geographic Information System (GIS) software or various other mapping applications such as Google Earth.

Some of the benefits of openly releasing spatial data include reducing the 'red-tape' associated with accessing and using data and raising awareness of the EPBC Act protected matters. This article highlights some recent releases of open data relevant to wetlands that are available from the Department of the Environment's 'Find Environmental Data' website.

Australia's 65 wetlands of international importance (Ramsar wetlands) are one of the EPBC Act protected matters and, for the first time, each site's boundary data has been compiled to a national spatial dataset. Basic attribute information for each site is included, with links to both the relevant Australian Wetlands Database page and each data providers' source metadata.

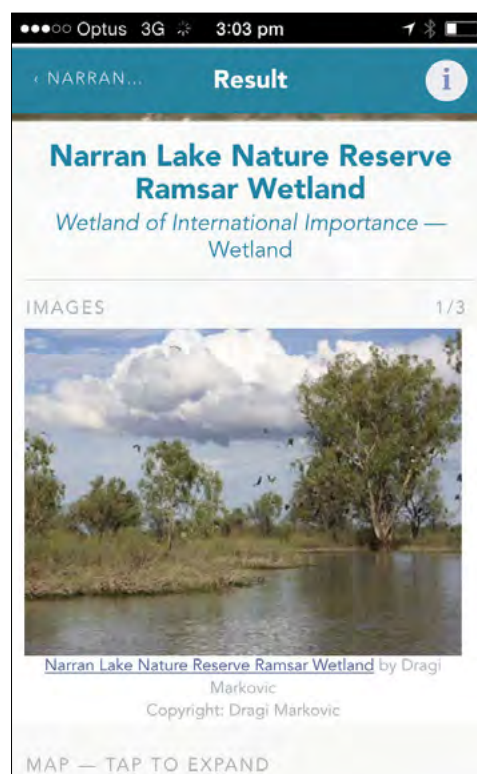
Complimenting the Ramsar spatial data is the release of data representing the upstream surface water catchment area of each Ramsar site. This was developed using the Australian Hydrological Geospatial Fabric (Geofabric) to trace the catchment network that contributes to inflows of each site. This data is used within the Department's Protected Matters Search Tool to help inform whether a proposed activity may have a downstream impact on a Ramsar site, and could also be useful for researchers and wetland managers alike.

Occurrence data of EPBC Act listed threatened species and ecological communities are also now available in a generalised polygon grid format for coarse scale visualisation and analysis. A modelled distribution for species is presented at a 10 kilometre grid resolution with a presence rank included to indicate the likelihood of occurrence. The example map shows what this distribution data looks like for the Australasian bittern (*Botaurus poiciloptilus*) relative to the Narran Lakes Nature Reserve Ramsar site.

The Australian Government has also released a redeveloped mobile friendly web site MyEnvironment which provides location based snapshots of nationally significant environmental features. This allows the public to find out what is significant about their local environment. One of the most exciting new functions of MyEnvironment is that users can now upload their own stories and photos for a particular environmental feature.

For further information, please visit the following links:

Find Environmental Data -
www.environment.gov.au/fed
 Australian Hydrological Geospatial Fabric (Geofabric) -
www.bom.gov.au/water/geofabric
 Protected Matters Search Tool -
www.environment.gov.au/epbc/protected-matters-search-tool
 MyEnvironment -
www.environment.gov.au/myenv/
 Australian Wetlands Database -
www.environment.gov.au/topics/water/water-our-environment/wetlands/australian-wetlands-database



The mobile friendly MyEnvironment web site provides location based information on matters of national environmental significance. Users can interact with the site by uploading stories and photos from their local environment (© Copyright, Australian Government Department of the Environment)