



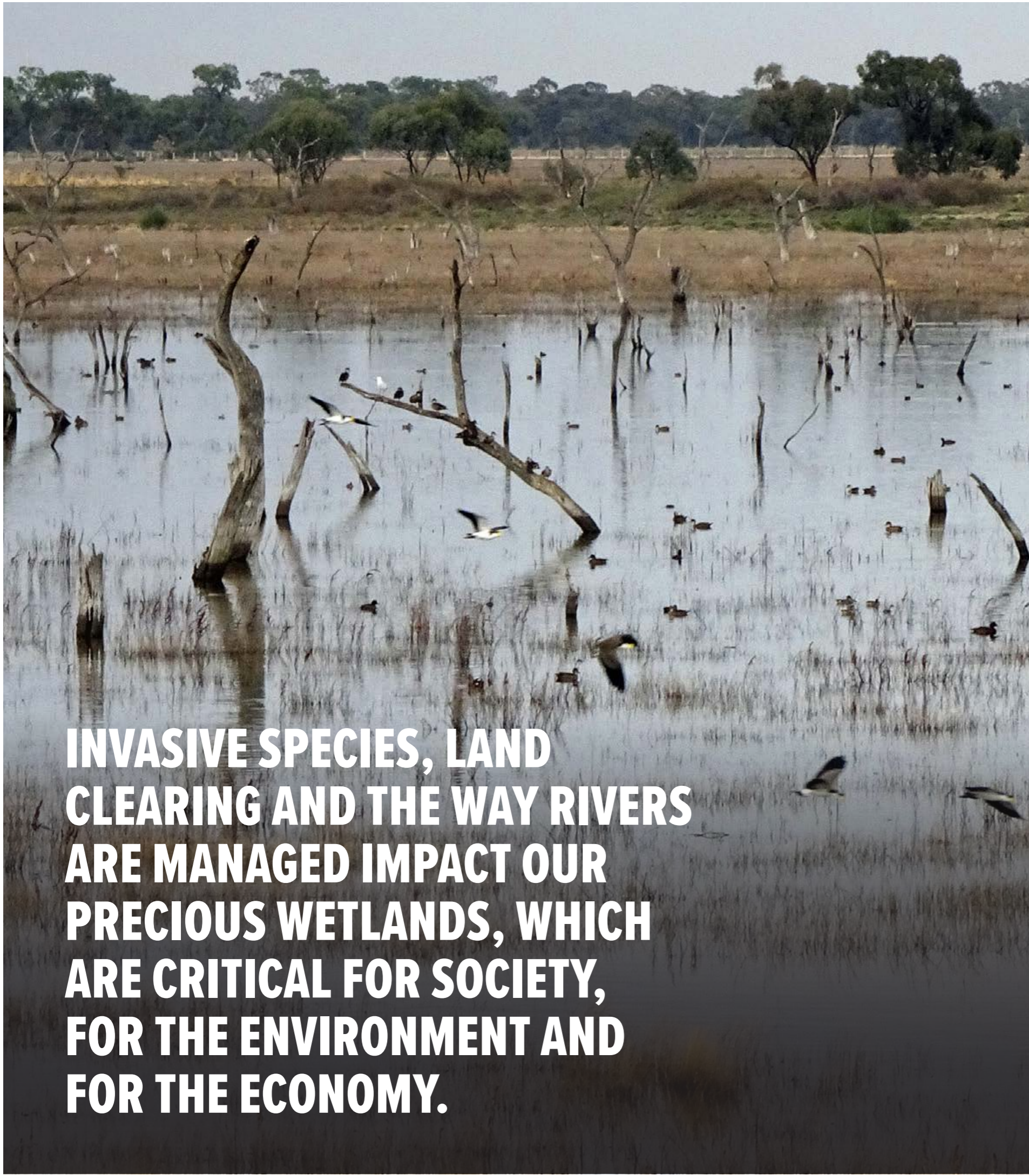
SAVING THE WETLANDS

of the Southern Murray-Darling Basin

Wetland Revival Trust works with Traditional Owners to protect, connect and restore high value wetlands, waterways and their catchments through landscape-scale programs in the Southern Murray Darling Basin.

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A degraded Murray Darling wetland system.
Credit: Friends of the Earth Australia

INVASIVE SPECIES, LAND CLEARING AND THE WAY RIVERS ARE MANAGED IMPACT OUR PRECIOUS WETLANDS, WHICH ARE CRITICAL FOR SOCIETY, FOR THE ENVIRONMENT AND FOR THE ECONOMY.

WETLANDS: VITAL, VULNERABLE, VANISHING

Wetlands are critical to life on earth. They reduce the impacts of floods, filter pollutants and provide vital habitat for countless plant and animal species. Wetlands regulate our climate and sequester more carbon per acre than any other ecosystem on earth.

Yet, these beautiful and biodiverse ecosystems are at immediate risk – disappearing three times faster than forests.

Since European occupation, at least two thirds of Victoria's wetlands have been destroyed and what's left is threatened due to over use

of precious water resources, urban development, pollution and poor land management practices.

Invasive species, land clearing and the way rivers are managed also impact our precious wetlands, which are critical for society, for the environment and for the economy.

Hundreds of species of wetland plants and animals are already extinct. Future generations should not have to visit museums to imagine the lost natural world.




ABOUT WETLAND REVIVAL TRUST

Wetland Revival Trust is a not-for-profit organisation established by renowned ecologists Damien Cook and Elaine Bayes to restore and protect the wetlands of the Southern Murray-Darling Basin.

Damien Cook is an award-winning naturalist with more than 35 years experience restoring wetlands. He is a recognised expert in wetland, riparian and terrestrial ecology, particularly in the establishment and management of aquatic and wetland plants, and the revegetation of terrestrial grassland and woodland ecosystems.

Elaine has been working as an environmental scientist and ecologist since 1994. Her main focus is on wetland ecology and management, frog and reptile surveys, fire effects in the Box Ironbark and Eltham Copper Butterfly protection. Elaine is an experienced environmental educator and developed the popular Wetland Plant Identification and Ecology Course run by Wetland Revival Trust.

Unless credited otherwise, all photos are by Damien Cook, Wetland Revival Trust.



The extensive floodplains and wetlands of the lower Loddon River in the southern Murray Darling Basin.

ABOUT THE MURRAY-DARLING BASIN

The Murray-Darling Basin is one of the most vulnerable river basins on Earth.

It is Australia's largest river system, covering one million square kilometres across five different states and territories. The Basin supports the production of 40% of the nation's food and provides drinking water for more than three million Australians.

Rather than flowing directly from source to sea, the Basin's rivers meander across giant floodplains on their journey to the ocean, creating species-rich wetlands and other biodiverse landscapes along the way. The Basin is home to 120 different species of waterbirds, more than 50 native fish species and millions of trees, some of which are hundreds of years old.

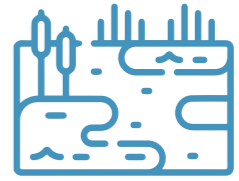
Pelicans with breeding coloration on bill, Maquarie Marshes



ABOUT THE MURRAY-DARLING BASIN

One of the most vulnerable river basins on earth.


30,000
WETLANDS

 **16**
INTERNATIONALLY RECOGNISED
AND PROTECTED WETLANDS

 **120** WATERBIRD SPECIES

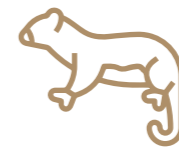
25
ENDANGERED BIRDS



15
NATIVE
FISH SPECIES



16
ENDANGERED
MAMMALS

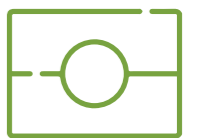


2.4 MILLION
PEOPLE
RESIDE
IN THE BASIN



 **70%** OF
AUSTRALIA'S
IRRIGATED
FARMLAND

50
FIRST NATIONS
LANGUAGE GROUPS



THE SOUTHERN MURRAY-DARLING BASIN



Kakadu of the south

The Southern Murray Darling Basin's wetlands were once both extensive and spectacular, a Kakadu of the south.

The Murray-Darling Basin is divided into two parts. Water in the northern Basin runs into the Darling River and water in the southern Basin runs into the Murray River.

The Southern Murray-Darling Basin includes New South Wales, ACT, Victoria and South Australia.



250 years ago the riverine plains of the Southern Murray-Darling Basin were a vast mosaic of interconnected natural ecosystems, supporting a spectacular collection of native plants, animals and thriving Aboriginal communities.

Pulsing through this landscape was the ebb and flow of seasons and longer-term climatic cycles: a network of rivers, creeks, floodplains and wetlands provided life-sustaining water to its plants, animals and people.

Over the last 200 years, colonisation has brought with it dramatic change. More than 80% of native vegetation has been cleared and converted to dryland or irrigated pasture and cropland. Rivers have been dammed and regulated to supply water for irrigated agriculture. And the land surface has been criss-crossed by irrigation channels, levees, roads and other infrastructure.

WATER USAGE

There have been farms in the Murray–Darling Basin for more than 200 years. From the 1950s, human populations and industries grew quickly, and so did the amount of water taken from the river, leaving less water for the environment.

As more water is used, the rivers and wetlands in the Basin deteriorate, especially during droughts. Reduced river flow means more salt in the Basin's rivers, more outbreaks of blue-green algae, more acid sulfate, more blackwater events and dried up wetlands.

There are fewer native fish, birds and mammals in the Basin than there were before Europeans arrived. At least 20 mammal species have become extinct and native fish populations are below historical records. A number of species are now on the endangered list, including: 16 mammal species, 25 bird species, five snake species and one turtle species.

Wetlands affected by a road and levee formed by an irrigation channel.

Intermittent Swampy
Woodland, drowned
at Third Reedy Lake

**SINCE EUROPEAN
OCCUPATION,
TWO-THIRDS
OF VICTORIA'S
WETLANDS HAVE
BEEN DESTROYED.**

THREATS TO WETLANDS

Altered hydrology

A change to the frequency with which a wetland floods, the depth to which it is inundated, the length of time inundation lasts and the season when inundation occurs all have impacts on wetland ecology and are a major cause of decline.

Loss of living canopy trees

As landscapes were modified, wetlands were often used as basins to receive excess irrigation water. These wetlands have held water for extended periods of time which has drowned canopy trees and changed the composition and structure of understorey vegetation. This has a huge impact on native fauna, removing hollows which act as nesting sites, destroying shade for nestlings and habitat for insects and preventing the accumulation of leaf litter and logs which are crucial for ground-dwelling fauna as well as soil health.

Overabundance of some species

Changes to environmental conditions, such as wetting and drying regimes of wetlands has resulted in certain species becoming overabundant and forming dense, extensive thickets, which shade out other wetland plants and reduce habitat quality and plant diversity. These plants include Common Reed (*Phragmites australis*), Cumbungi (*Typha orientalis*) and Tangled Lignum (*Duma florulenta*), which are all native wetland species that now need to be managed.

Environmental weeds

These plants have a devastating impact on native vegetation by outcompeting native plant species and altering habitats for native fauna. Certain species, such as African boxthorn (*Lycium ferocissimum*), Peppercorn (*Schinus mole*), Desert Ash (*Fraxinus angustifolia* subsp. *angustifolia*) and Horehound (*Marrubium vulgare*) can now only be kept under control by ongoing management as they are abundant and widespread and produce a constant source of seed allowing reinfestation.



African Box Thorn.
Credit B. Trounce, NSW DPI © State of NSW

Salinisation

Wetlands generally occur in lower parts of the landscape where the groundwater table is closest to the surface and irrigation and clearing of vegetation impact salinity. Increasing the salinity of a wetland has significant impacts on wetland plants and animals – if salinity levels become too high, freshwater species cannot survive and will be replaced by more salt-tolerant species.



Feral animals and predators

Feral animals have an impact on water quality and prey on native fauna. European carp increases turbidity in wetlands and suppresses the growth of aquatic plants, gambusia prey on tadpoles and compete with native fish. Feral pigs cause significant soil disturbance and rabbits and hares change the structure and composition of vegetation and disturb soil. Foxes and cats prey on native fauna – predation by foxes is a significant cause of mortality for brolga, and eastern long-necked and Murray River turtles.

Climate change

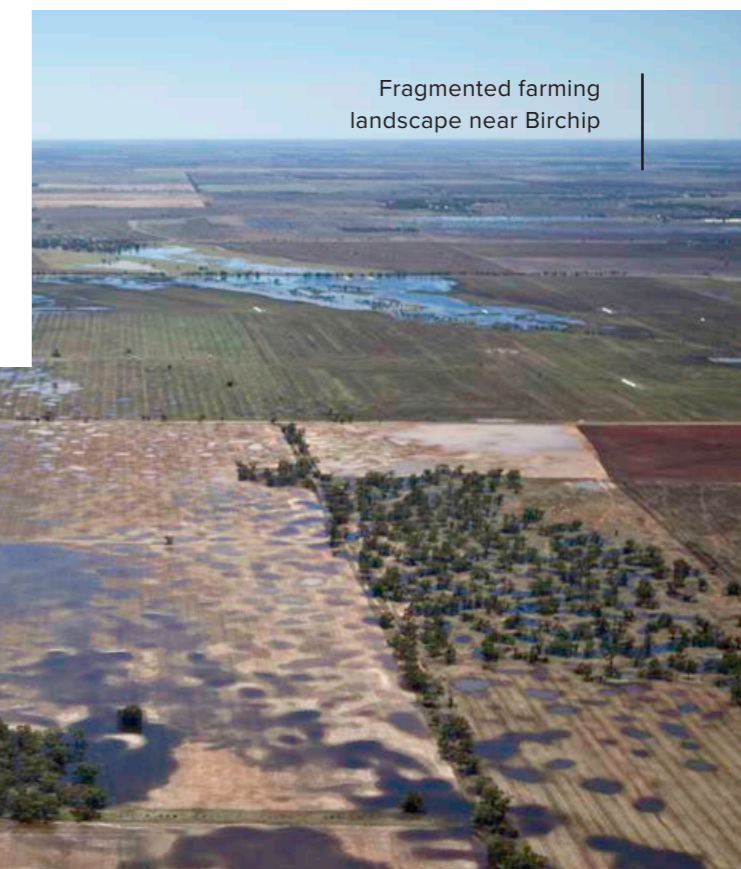
Wetlands are the most vulnerable ecosystems to climate change in Victoria. Change to temperature, rainfall, the severity and frequency of extreme weather events, will have catastrophic impacts on wetland ecosystems. Climate change will also exacerbate many of the other threats listed here.

Eutrophication

This excessive richness of nutrients, such as nitrogen and phosphorous, often due to run-off from land, causes a dense growth of plant life. Wetlands experiencing eutrophication are likely to suffer from vigorous growth of terrestrial weeds as they dry out. Agricultural lands, including dairies, piggeries and intensive animal production, surround nearly all the wetlands of the Southern Murray-Darling Basin which makes them prone to run-off and therefore eutrophication.

Clearing and fragmentation

Clearing and cropping of native wetland vegetation has been particularly prevalent during recent drought and some of the largest and most intact wetlands exist on private land. Wetlands have also become isolated from each other, where previously they existed as chains or clusters across the landscape. This fragmentation means wetlands are now less resilient with species they support being vulnerable to genetic inbreeding and unable to recolonise if drought or other impacts make them locally extinct.



Fragmented farming landscape near Birchip

WETLAND SPECIES UNDER THREAT

There are hundreds of threatened or vulnerable species of fauna and flora in the Southern Murray-Darling Basin.



Litoria raniformis, adult male

Growling Grass Frog

(Litoria raniformis)

Status: Nationally vulnerable

Once widespread across Victoria, but has since disappeared from most of its habitat. One of the largest frog species in Australia, it reaches up to 104mm in length and possesses small teeth attached which are used for holding prey, which is often swallowed whole. There are several threatening processes that have contributed to the decline in abundance and distribution of the Growling Grass Frog which include drought, habitat loss and altered flooding regimes.



Australasian Bittern
Photo credit: Andrew Silcocks

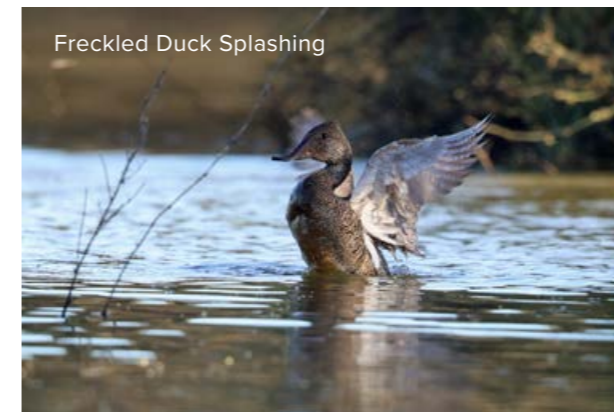
Australasian Bittern

(Botaurus poiciloptilus)

Status: Critically endangered in Victoria and Nationally endangered

Found in the freshwater wetlands of the Southern Murray Darling Basin in dense beds of reeds and rushes, where their secretive nature makes them difficult to see. Masters of blending into their surroundings and keeping perfectly still when disturbed. Drainage of swamps and natural wetlands has destroyed habitat leading to their listing as an endangered species.

SOUTHERN MURRAY-DARLING BASIN



Freckled Duck Splashing

Freckled Duck

(Stictonetta naevosa)

Status: Endangered in Victoria

A waterfowl species endemic to Australia, characterised by dark grey to black plumage covered with small white flecks, which gives the duck a 'freckled' look. Population is at risk from habitat destruction, droughts and game hunting. Institutions are now establishing breeding programs to aid population growth.



One Grey-crowned Babbler feeding another a pupae

Grey-crowned babbler

(Pomatostomus temporalis)

Status: Vulnerable in Victoria

The largest of Australia's four babbler species. They forage in groups on the ground among leaf litter, shrubs and fallen trees. Habitat degradation due to land clearing has led to the decline of the eastern subspecies. Grey-crowned babblers have a poor ability to adapt to new habitats leading to poor breeding success and population decline.

WETLAND SPECIES UNDER THREAT

SOUTHERN MURRAY-DARLING BASIN



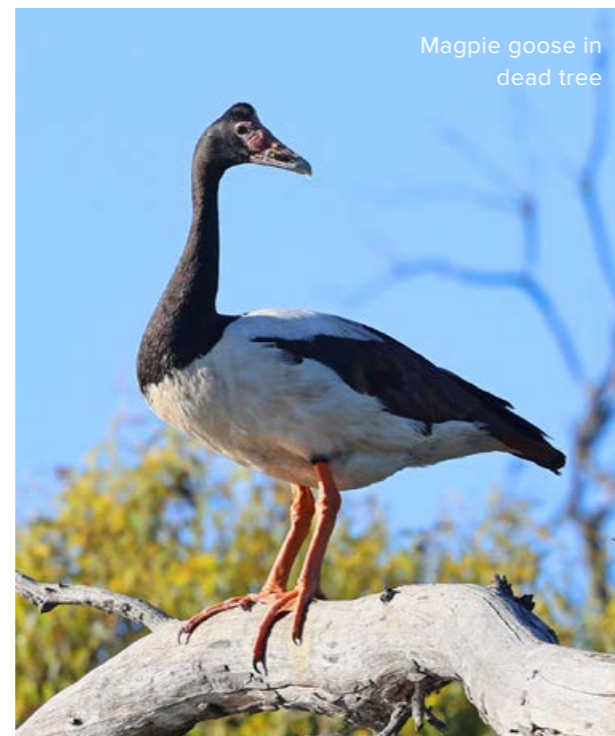
Senecio behrianus
(Stiff Groundsel)

Stiff Groundsel

(*Senecio behrianus*)

Status: Critically endangered in Victoria and Nationally endangered

A small shrub, endemic to south-eastern Australia, once occurring in South Australia, New South Wales and Victoria. Once widespread in the lower Murray-Darling river system, and later presumed extinct until it was rediscovered at Corop (Victoria) in 1991. Only five known wild populations and five reintroduced populations in Victoria. Changes in water flow regimes with construction of dams, weirs, and levees, grazing on floodplains and increasing soil salinity have all contributed to its decline.



Magpie goose in
dead tree

Magpie Goose

(*Anseranas semipalmata*)

Status: Vulnerable in Victoria

The sole living representative species of the family Anseranatidae. Once widespread in Victoria and a significant seasonal food source for Aboriginal people, now disappearing due to the drainage of wetlands which are its breeding grounds.

Photo source: DELPW



Southern Purple Spotted Gudgeon (Murray Darling Population)

(*Mogurnda adspersa*)

Status: Critically endangered in Victoria

The Murray-Darling Basin population has undergone significant decline and is now critically endangered in Victoria. Thought to be extinct in Victoria until 2019, it was re-discovered in the Reedy lakes system near Kerang. Distribution of this small native fish has been greatly reduced by river regulation, invasive species, habitat loss and loss of permanent floodplain wetlands.



Photo credit:
G.Schmida

Murray Hardyhead

(*Craterocephalus fluviatilis*)

Status: Critically endangered in Victoria and Nationally endangered

A tiny species of freshwater fish, native to inland parts of south-eastern Australia. Once widespread in Murray and Murrumbidgee River systems in southern NSW and northern Victoria, they have suffered a serious population decline and are now critically endangered in Victoria. Habitat degradation, poor water quality, decreasing connectivity with floodplain lakes and the impacts of introduced species such as Eastern Gambusia have all impacted the species.

Juvenile Musk Duck,
catching up with
siblings



**“THE FINAL
CHAPTER IS
OURS TO WRITE.
WE KNOW WHAT
WE NEED TO DO.
WHAT HAPPENS
NEXT IS UP TO US.”**

– David Attenborough



“I like the satisfaction of working on Country, being connected to the environment and feeling part of it. It’s a good feeling eradicating weeds and working to get the native plants and animals back, to return the Country to better health”

– Uncle Duck Charles – Barapa Barapa Elder



WORKING IN PARTNERSHIP WITH TRADITIONAL OWNERS

Aboriginal people have cared for their Country for many thousands of years and wetlands have always played a central role in their Cultural, spiritual and economic life.

The wetlands of the Southern Murray-Darling Basin take in parts of the Traditional lands of the Dja Dja Warung, Wemba Wemba, Barapa Barapa, Taungurung and Yorta Yorta First Nations Peoples.

Aboriginal connection to wetlands is evident in the many cultural sites that are found within

and around them, including scar trees, middens, campsites, oven mounds and ceremonial grounds.

Traditional Owners are employed to work alongside Wetland Revival Trust in restoring wetlands and ensuring Traditional Ecological Knowledge and stories are perpetuated for generations to come. This provides Traditional Owners with meaningful employment as well as an opportunity to work on Country. Wetland Revival Trust aims to grow its First Nations workforce in years to come.

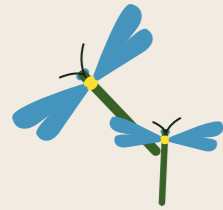


“Getting out and planting more trees and other native plants is good for Country. When we do that work, we are strengthening our connection with family and Country. It’s about doing the right thing for the earth.”

– Rochelle Patten, Barapa Barapa – Yorta Yorta Woman

WETLAND REVIVAL:

Our impact to date



180ha

PROTECTED THROUGH OWNERSHIP
OF WIRRA-LO WETLANDS UNDER
CONSERVATION COVENANT.



5052ha

WETLANDS UNDER
ADAPTIVE MANAGEMENT

1870ha



VEGETATION RESTORED ON PRIVATE
AND PUBLIC LAND



90%

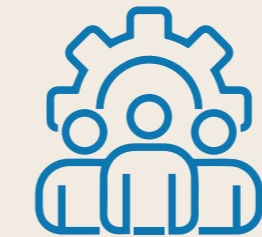
ESTABLISHMENT
RATE OF PLANTS
PLANTED IN
RESTORATION PROJECTS

56

PUBLIC
AND PRIVATE
WETLANDS
UNDER
ADAPTIVE
MANAGEMENT

23

PRIVATE
WETLANDS
UNDER
MANAGEMENT



100%

WETLAND
RESTORATION
WORKS ENGAGED
TRADITIONAL
OWNERS

32

WETLAND
RESTORATION COURSES DELIVERED



1073

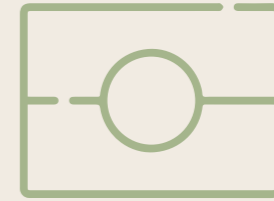
PEOPLE TRAINED IN
WETLAND RESTORATION

A DROP OF HOPE

Our impact to date

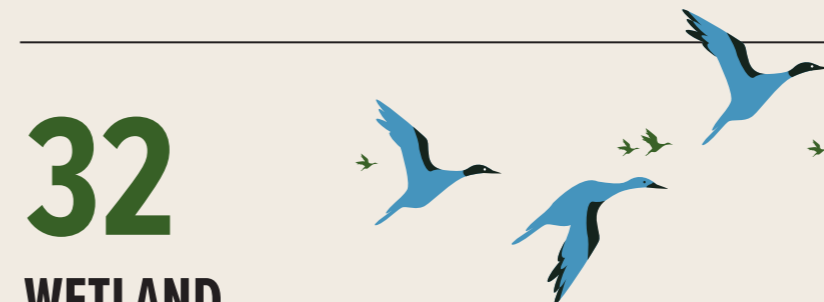
38

TRADITIONAL OWNERS EMPLOYED



24

TRADITIONAL OWNERS
TRAINED IN WETLAND
RESTORATION





PROTECTED

WIRRA LO WETLANDS

Purchase of Wirra Lo

Wirra-Lo wetlands are a complex of swamps, creeks and depressions located on a 180ha private property in northern Victoria, nestled between the Loddon and Murray Rivers.

Wirra-Lo is one of the last strongholds of the nationally vulnerable Growling Grass Frog in northern Victoria and its wetlands support breeding habitat for the nationally endangered Australasian Bittern.

Previous owners Ken and Jill Hooper wanted to see Wirra-Lo protected forever and offered Wetland Revival Trust the opportunity to purchase it with a conservation covenant applied.

In 2023, with the generous support of donors and philanthropic organisations, Wetland Revival Trust completed fundraising to purchase Wirra Lo Wetlands, ensuring its protection for generations to come.

Since purchasing Wirra-Lo

- ✓ Extensive weed and pest control
- ✓ Environmental water allocation to improve hydro ecology of the site
- ✓ Restored natural vegetation
- ✓ Introduced locally-endangered native small-bodied fish.
- ✓ Revegetated 35-hectare section known as Lignum Swamp South, protecting 37 threatened species of flora and fauna

Species now protected at Wirra Lo include:



- Growling Grass Frog (*Litoria raniformis*)
- Southern Purple-spotted Gudgeon (*Mogurnda adspersa*)
- Australasian Bittern (*Botaurus poiciloptilus*)
- Ridged Water Milfoil (*Myriophyllum porcatum*)
- Stiff Groundsel (*Senecio behrianus*)
- Grey-crowned Babbler (*Pomatostomus temporalis*)

OUR IMPACT

100%

Of wetland restoration works engaged Traditional Owners

38

Traditional Owners employed



180

Hectares protected through ownership. Wirra-lo Wetlands under conservation covenant. Complex of 11 wetlands



5

FFG Listed Species covered by management plans at Wirra-lo

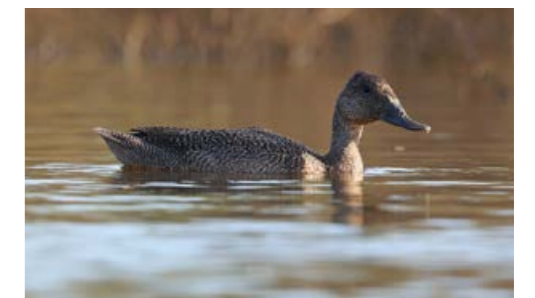
1,073

People trained in wetland restoration techniques and wetland ecology



152

Native Fauna at Wirra-lo
The number of animal species recorded and protected at Wirra-lo Wetland Reserve, including 18 threatened species.



5,052

Hectares of wetlands under monitoring and adaptive management across 56 wetlands on public and private land

1,870

Hectares of vegetation restored across private and public land. Includes assisted natural regeneration (natural recruitment) hydrology restoration projects

90+%

Establishment rate of plants planted in restoration projects



136

Native plants at Wirra-lo, including 19 threatened species.
The number of plant species recorded and protected at Wirra-lo, including 19 threatened species

32

Wetland restoration courses delivered



23

private wetlands under management



HELP US SAVE THE WETLANDS OF THE SOUTHERN MURRAY-DARLING BASIN

Make a tax-deductible donation so that we can
protect more public and private wetlands.

CONTACT

Damien Cook – 0402 127 933

Elaine Bayes – 0431 959 085



CONTACT US

PO Box 188, Chewton VIC 3451

www.wetlandrevivaltrust.org | admin@wetlandrevivaltrust.org

Damien Cook – 0402 127 933 | **Elaine Bayes** – 0431 959 085