



National Irrigators' Council

**Submission to
House of Representatives
Inquiry into the management
and use of
environmental water**

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The National Irrigators' Council is the peak body representing irrigators in Australia, supporting 32 member organisations covering the Murray Darling Basin states, irrigation regions and the major agricultural commodity groups. Council members collectively hold approximately 7,000,000 megalitres of water entitlement.

The Council represents the voice of irrigators who produce food and fibre for Australia and significant export income. The total gross value of irrigated agricultural production (GVIAP) in Australia in 2015-16 was \$15.0. {ABS} The total GVIAP represented 27% of Australia's total gross value of agricultural production (GVAP) of \$56.0 billion in 2015-16. Irrigated agriculture produces essential food such as milk, fruit, vegetables, rice, grains, sugar, nuts, meat and other commodities such as cotton and wine. The Council aims to develop policy and projects to ensure the efficiency, viability and sustainability of Australian irrigated agriculture and the security and reliability of water entitlements.

Contact: Steve Whan
CEO: National Irrigators' Council

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Introduction

The National Irrigators Council (NIC) welcomes the opportunity to provide input to the House of Representatives inquiry into the management and use of environmental water. We note the inquiry's terms of reference:

1. Maximising the use of environmental water for the protection and restoration of environmental assets
2. Considering innovative approaches for the use of environmental water
3. Monitoring and evaluating outcomes of the use of environmental water; and
4. Options for improving community engagement and awareness of the way in which environmental water is managed; and
5. Any other matter of relevance that the committee wishes to consider.

The task of deriving continued environmental improvement across Australia's river systems and waterways must be viewed as a long term process; similarly, the process of adjustment to water reform by Australia's food and fibre producing irrigated agriculture sector, for industry and communities, is occurring over the long term. Notwithstanding the challenges faced by the irrigated agriculture sector as part of the task of restoring the environment of Australia's river systems, water reforms over a twenty year period, including the National Water Initiative, followed by the introduction of the Murray Darling Basin Plan, are showing signs of making a difference.

Recognition of the need to improve the coordination of water management and water use efficiency in Australia is broadly embedded in many of the significant policy frameworks over recent decades.

The 1994 Council of Australian Governments (COAG) water reform framework and subsequent initiatives recognised that better management of Australia's water resources is a national issue. As a result of these initiatives, states and territories have made considerable progress towards more efficient and sustainable water management over the past 10 years. For example, most jurisdictions have embarked on a significant program of reforms to their water management regimes, separating water access entitlements from land titles, separating the functions of water delivery from that of regulation, and making explicit provision for environmental water.

The 1994 COAG reforms represented the agreement on initiatives that saw specifically:

- water pricing reform based on the principles of consumption-based pricing and full cost recovery;
- elimination of cross subsidies and making other subsidies transparent
- clarifying water property rights
- allocating sufficient water for environmental purposes
- facilitating and promoting water trading
- rigorous assessment of new rural water projects, and
- reforming water industry institutions.

The 2004 National Water Initiative (NWI) recognised the need to support healthy working rivers and groundwater systems. It also recognised the need for investment to maximise the economic, social and environmental value of Australia's water resources. The NWI agreement was recognised to be a more specific and comprehensive step than previous attempts at establishing a national water framework; it involved reforms such as improved water planning, water trading and water accounting. Jurisdictions have progressed reforms, including the management of environmental water.

NWI principles have resulted in an entitlements framework that supports entitlements holder's property rights; it has also supported the development of both an annual and permanent water market. NWI principles were designed to give confidence to irrigation dependent communities, to economic development and to the environment. The objective was to *'achieve a national compatible market, regulatory and planning based system of managing surface and groundwater resources for rural and urban use that **optimises economic, social and environmental outcomes**'*.

As a result of various water reform processes, the Commonwealth now holds vast quantities of water for environmental use and has the associated responsibility to deliver and monitor that water, and the outcomes over time.

The significant role of the irrigated agriculture sector as part of water reform in Australia in recent years, must be acknowledged. Social and economic analysis tells us that water acquisition has been devastating for many communities as a result of the removal of water. The evidence of social and economic impacts under the review of the Northern Basin, for example, is stark. The review showed that the recovery of 278GL of water has left severe impacts on several communities, yet the extent of environmental improvement across the Northern Basin to date, is marginal, and in some cases indiscernible. It is estimated that the recovery of 278GL has cost the Northern Basin \$139 million annually in lost farm-gate production. And based on a conservative 3:1 multiplier effect, this accounts for over \$400 million lost to Northern Basin communities annually.

Since the commencement of the Basin Plan, NIC has argued for a balance between social, environmental and economic outcomes to ensure the Plan is fair and workable. Without this objective, communities will continue to bear the brunt of an unsatisfactory Plan. Our commitment remains to genuine reform, but not at the expense of a viable, productive irrigated agriculture sector.

The trajectory of reform under the Basin Plan has traditionally been heavily biased towards water as the only environmental management solution to address environmental decline in our river systems. The Basin Plan was designed to deliver long-term sustainability of agriculture and the environment, yet the delivery of volume of water has taken precedence over the welfare of people, communities and agriculture food and fibre production with to date, questionable environmental outcomes.

NIC has fought strenuously for a balanced Basin Plan with triple bottom line outcome, reflected in healthy viable communities and a sustainable environment for the future. We have long argued that the implementation of the Plan must occur in the manner that was promised, and that is, an unwavering adherence to the commitments given to the irrigated agriculture sector and Basin communities by the Government and the Murray Darling Basin Authority (MDBA). These include:

- willingness to reduce the amount of water to be recovered through improved river management and more efficient environmental watering
- adaptive management and 'localism', and integration of environmental, social and economic modelling
- no changes that would impact on the reliability of irrigators' water allocations
- no changes to rules that would result in negative impacts on third parties
- no changes that would lead to a change in the characteristics of a class of water due to that water being transferred to the Commonwealth (for example, the use of a mega litre of general security water held by the Commonwealth's must be governed by the same rules and terms as apply to an irrigator holding a like entitlement).

Water entitlements are regarded as business assets, where those assets are accepted as collateral in acquiring loans. Water trading is now enabling irrigators to use water as a business management mechanism and in some cases, as a drought mitigation measure.

The Commonwealth Environmental Water Holder (CEWH) maintains a significant position in the water market, where the Commonwealth is by far the biggest owner of water in the Murray Darling Basin. In this context, the CEWH's water trading guidelines should include consideration of its impact on the market as a result of any trading activity. We suggest that any future drought will test the water trading environment. Farmers who have sold entitlements may find it difficult to afford water allocations in the future and the test will come as to whether the water trading system has the capacity to adjust and whether governments have the capacity to stay with a market system only.

As part of its inquiry into National Water Reform, the Productivity Commission, refers in its draft report in September 2017 ¹ to the billions of dollars of water entitlements held by Governments. The Commission notes that Commonwealth holdings alone may be valued at up to \$5 billion once water acquisition is finalised. Active management by environmental water holders involves making trade-offs between competing environmental needs at different locations and times, including options to trade water or retain it for use the following year. The Commission observed the need for strong governance by all governments to ensure environmental water is managed appropriately, noting that these decisions affect regional environments and communities, and are of significant interest to other water users and involve substantial funds.

However, it is also useful to understand how the trading of water can be used for the conservation of water and for achieving environmental benefits.

Commonwealth water holdings

As at 31 January 2018, the Commonwealth environmental water holdings ² total 2,672,408 megalitres (ML) of registered entitlements with a Long term average annual yield of 1,836,190 ML.

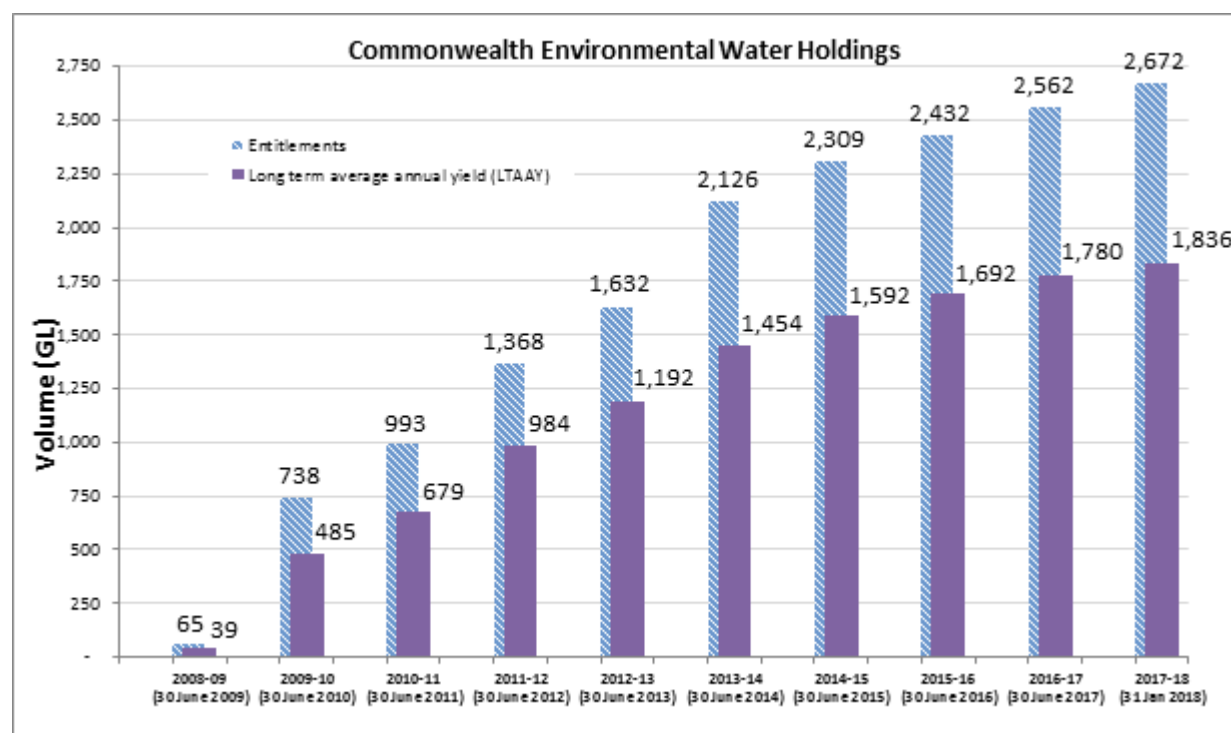


Table 1: Environmental water holdings

1. Maximising the use of environmental water for the protection and restoration of environmental assets

The acquisition of more water for the environment will not on its own deliver environmental benefits. NIC has long argued for a shift of focus from numbers to outcomes. We have advocated for practical solutions and have sought a comprehensive examination of a suite of other measures beyond 'just adding water', from which environmental benefits will be derived.

¹ Productivity Commission draft report: National Water Reform, September 2017

² Department of Environment and Energy: About Commonwealth environmental water

During the review of the Northern Basin, it was clearly demonstrated from studies in communities in the north which showed that the acquisition of more water for the environment will deliver a questionable level of environmental benefit while at the same time, guaranteeing exponentially higher levels of social and economic pain for irrigated agriculture dependent communities.

NIC has stressed that to achieve improved ecological outcomes (which we support), a range of **complementary, or non-flow, measures**, should be examined. These measures are complementary to environmental water use. Measures improving riverine and riparian outcomes have been routinely delivered through successive federal government programs such as Caring for our Country and the National Landcare Program. Any investment approach should involve a range of measures which will support the Basin Plan's environmental objectives over the short, medium and long-term to ensure native species have the greatest opportunity to thrive. Such an approach will deliver the Basin Plan's environmental objectives over time without further collateral damage to regional communities.

NIC supports the capacity of the CEWH to trade held water and has advocated that the proceeds of trading should be used to fund complementary measures. Basin state water Ministers have requested Basin officials to undertake the necessary work to examine complementary measures.

The Northern Basin Review also made recommendations about the need to implement complementary, or non-flow, measures. In 2017, the Productivity Commission as part of the review of National Water Reform endorsed the need for an outcomes focus, and included a series of strong draft recommendations about environmental water management and complementary measures (*detailed below*). The Commission noted *'the trade of environmental water can help maximise environmental and community benefits by putting water to better use in different locations or at a later time, or by using sale proceeds to fund complementary waterway management activities'*.

Such complementary waterway management activities, or complementary measures, fall into two categories, fundamental interventions or actions required to achieve improved ecological outcomes in our river systems, or new opportunities for operation and management of environmental resources.

Examples of such measures are:

a) Carp control through the release of the Carp Herpes virus

Carp make up around 80% of the fish biomass in the Murray Darling Basin, and this level of presence costs the nation up to \$500 million in lost opportunity annually. There is empirical evidence that shows carp impact on water quality, plankton levels, the frequency and duration of algal bloom, native fish, macrophytes and water birds¹. Unfortunately, much of this impact is wrongly attributed to productive water-users.

Research has shown that a carp specific virus known as Cyprinid herpesvirus 3 is highly effective on the carp species present in Australia. International case studies indicate the virus will kill 70-100% of carp in a native population within a very short time. The virus also has been shown to only affect Common carp and Koi carp (same species) and that it not impact adversely on other fish species, birds, reptiles, amphibians, mammals or crustacea.

While the types of environmental flows built into the Basin Plan might deliver some benefits to some valuable components of the ecosystem, they are also known to increase carp breeding if delivered onto floodplain habitats during warmer months.

In 2016, NIC welcomed the Australian Government's announcement of a \$15 million to undertake the necessary work with a plan to release a carp-specific herpes virus into waterways. The National Carp Control Program, led by the Fisheries Research and Development Corporation is leading the process, the focus of which work is to:

- Undertake research and development to address key knowledge gaps
- better understand and manage risks around carp control
- plan for an integrated approach to control carp in Australia's waterways

- build community awareness and understanding of the proposal to release the carp virus;
- identify and address stakeholders' and communities' concerns about that proposal
- develop detailed strategies for carp control and subsequent clean-up; and,
- support national coordination on all elements of the plan's development.

To ensure that carp numbers do not rebuild after release, it will be necessary to employ additional measures to suppress carp and promote recovery of native fish communities (with the latter being estimated at 10% of pre-existing condition). With 30-40% of the freshwater fish species in the Murray-Darling now listed as threatened or conservation dependent, it will be critical that a series of policy actions are put in place sufficient to recover stocks.

While carp is the biggest threat to the health of aquatic ecosystems across the Basin, other factors are contributing to the decline of native species, including:

- degradation of habitat and water quality;
- overfishing;
- thermal pollution; and,
- barriers to fish migration.

Significant social and economic benefit, derived from improved inland fish resources, is likely to occur as a result of the eradication of carp and the rectification of the above matters.

NIC recommends that the any carp biocontrol program and improvements to environmental flow delivery need to be accompanied by parallel efforts to:

- re-establish populations of locally extinct native fish species through re-stocking following carp removal
- mitigation of cold water pollution at four priority dams
- restore native fish habitat along river reaches within priority river valleys through the Murray-Darling Basin.

b) appropriate management of cold water pollution

The importance of water temperature for breeding, feeding, growth and larval survival in native fish species has been well understood for over a decade, as is the impact of cold water pollution on aquatic organisms and river health in the Murray-Darling Basin. A recent study noted that mortality levels in Murray cod eggs can reach 100% at 13 degrees Celsius, and that low water temperatures can dramatically reduce growth rates in species including Freshwater catfish and Murray cod, and can cause up to 30% mortality in Silver perchⁱⁱ. All of these species are 'listed' under either national or state environmental legislation and over 2500km of riverine environment is now understood to be affected by thermal pollution in the Murray-Darling Basin.

There are cost effective engineering solutions to cold water pollution and these measures must be given a proper place in the Basin Plan.

c) improvement of fish migration through fishways along the Barwon-Darling & tributary catchments

Many native fish species are now known to migrate during various stages of their life and barriers to migration are now listed as a key threatening process in state and Commonwealth threatened species legislation.

Future-focussed investment from the MDBA in the Sea to Hume program has seen fish passage restored over 2225 km of riverine habitat by installation of fishways at 15 barriers in the southern MDB. Reinstatement of fish passage at 13 barriers in the main stem of the Darling, Barwon, Paroo and Warrego Rivers would reinstate continuous access 5180 km. This outcome would exceed the Sea to Hume program, which is currently, and rightfully, lauded as one of the largest ecological rehabilitation projects undertaken in Australia. Tributary fishways also open up significant kilometres

of passage and improve environmental outcomes associated with instream site specific indicator sites.

d) restoration of native fish habitat

A healthy habitat is vital to the condition of native fish communities. Numerous studies throughout Australia have demonstrated the value of restoring fish habitat for native fish communities. In the Condamine River, habitat improvement along the Dewfish Demonstration Reach resulted in significant increases in Golden perch (5 x increase), Murray cod (from absent to captured every survey), Spangled perch, Bony bream (11 x increase), Carp gudgeon (1200 x increase), and Murray-Darling Rainbowfish (60 x increase).

Re-snagging in the lower Murray resulted in a threefold increase in Murray cod, and was estimated to significantly increase overall population sizeⁱⁱⁱ. It would also result in lower flow thresholds being required if re-snagging occurred at lower heights to provide adequate habitat that is submerged for periods long enough to be of benefit.

e) feral animal control in wetlands such as the Narran Lakes, Gwydir Wetlands and Macquarie Marshes.

Feral pigs are one of Australia's most successful and widespread invasive species. Their success is largely due to their omnivorous diet, comprising mostly green grasses and herbs. They also eat a variety of native vertebrate species including reptiles, amphibians, birds and mammals.

Feral pigs have been present in the Macquarie Marshes since 1896 and they threaten important native wildlife species in the marshes such as the snipe, storks and ibis.

Studies undertaken on the stomach content of feral pigs in the Macquarie Marshes have revealed grasses, roots, ferns, fruits, crops, frogs, lizards, snakes, turtles, birds, mammals, invertebrates and carrion. Five different vertebrate species were found, including eastern bearded dragon, barking marsh frog, green tree frog, spotted marsh frog and De Vis banded snake.

In recent years, pig populations in the Gwydir region have exploded. This is partly due to the delivery of environmental water to wetland areas during dry-sequences as this is assisting the pigs to survive during drought. The expansion of feral pigs has [negative impacts on neighbouring landowners through stock losses, and understandably causes landholders to be concerned about the management of environmental water.](#)

f) Riparian land management

The health of our waterways is inextricably linked to the surrounding land and land use. Grazing management adjacent to water ways is essential to maintain stream bank stability and limit erosion, sedimentation and poor water quality. Offsite [management of land, vegetation and soils, particularly in upstream catchments, will benefit water quality.](#)

Riparian buffers should continue to be encouraged in high risk and vulnerable locations as should programs to encourage improved grazing and cropping strategies upstream, to limit poor quality runoff. It is critical that measures be implemented to mitigate the significant damage occurring due to livestock and feral animals on icon sites such as Gwydir Wetlands, Macquarie Marshes and Narran Lakes, beneficiaries of government water.

g) Weeds

Weeds are well known as a significant threat to Australia's natural environment and primary production industries. They displace native species, contribute significantly to land degradation, and reduce farm productivity. Aquatic weeds continue to spread through flooding, moving the plants to other waterways. Many aquatic weeds have been introduced or have colonised new waterways.

Invasive species, including weeds, animal pests and diseases, represent the biggest threat to biodiversity after habitat loss. Weed invasions change the natural diversity and balance of ecological communities, threatening the survival of many plants and animals as the weeds compete with native plants for space, nutrients and sunlight.

It is estimated that nationally, the impact of invasive plants continues to increase with exotic species accounting for about 15% of all flora. This figure is increasing yearly by about ten new species per year.

Summary

In summary, a more integrated, holistic Plan focused on non-flow measures is the key to undoing the damage that has been, and continues to be, done to communities. Such a focus would:

- deliver equivalent ecological outcomes required to meet Basin Plan objectives that will not be met through existing water recovery measures
- lead to the rehabilitation of native fish species
- improve productivity within aquatic ecosystems
- increase the resilience of threatened species
- improve social and economic prosperity from aquatic resources
- contribute to the achievement of cultural water objectives.

2. Considering innovative approaches for the use of environmental water

During the 2014 review of the Water Act 2007, NIC advocated for greater flexibility within the Act to enable the CEWH to trade environmental water and direct the funds towards environmental restoration. NIC welcomed the subsequent changes to section 106 of the Water Act, as a result of the review. These changes are now enabling increased flexibility for the CEWH to sell water allocations if the proceeds are used for water acquisitions or environmental activities.

Under the legislation, the CEWH can only invest in environmental activities that will improve environmental outcomes from the use of Commonwealth environmental water, and are undertaken for the purpose of protecting and restoring environmental assets in the Basin.

In late 2017, the CEWH released a discussion paper titled *Development of a Framework for Investing in Environmental Activities*³ noting that the proceeds from any sale of Commonwealth environmental water allocations will be considered with other potential water management options. These might include carrying water allocations over into the next watering year, or purchasing water at another time or place. The discussion paper also noted that *'the majority of annual water allocations assigned to the CEWH will be used in rivers, wetlands and floodplains to meet environmental needs'*.

We refer the Inquiry committee to NIC submission⁴ provided to the CEWH *Framework for Investing in Environmental Activities* consultation process, where we suggested CEWH funds be directed to a range of initiatives and measures, including:

- the national carp control program (*detailed in Section {1} herein*)
- delivering community benefit by supporting habitat and/or recovering threatened species and threatened ecological communities and critical ecosystems to improve ecological outcomes in partnership with a private landholder by using Commonwealth water in a productive system

³ *Development of a Framework for Investing in Environmental Activities, Commonwealth Environmental Water Holder discussion paper, November 2017*

⁴ *National Irrigators' Council submission to the Commonwealth Environmental Water Holder: Framework for Investing in Environmental Activities, October 2017*

- consideration of enhanced social, economic and cultural wellbeing to improve a community's capacity to attract industry, business and tourism opportunities, and by extension with potential to grow a region's health, education and skills capabilities
- alignment with, and/or enhancement of, other federal government programs
- a project should not involve issues of competitive advantage in line with competitive neutrality principles.

We advocated for consideration of investment in projects with an Irrigation Infrastructure Operator (IIO) to support the targeted delivery of environmental water to sites. These should be developed in collaboration with the IIO and other relevant stakeholders. Activities might include assisting in the restoration of an area, for example a floodplain or wetlands, for broader environmental and community benefit.

It is critical that through the *Investment Framework*, the CEWH works in collaboration with state environmental water holders, local government and/or community organisations to leverage investment opportunities that will deliver multiple objectives. This might include wetland watering and pest and feral animal control. Funding could be used to enable and support integrated project delivery.

To undertake the types of initiatives suggested, in-kind contributions to CEWH activities could be made by other delivery partners by way of provision of machinery, labour, the use of services and facilities, the use of existing irrigation infrastructure, and professional advice and services. Delivery partners might include farmers/private landholders, irrigation infrastructure operators, fishing and other sporting groups, local government, state governments, indigenous groups, local industry, naturalist groups, Catchment Management Authorities (CMAs), Local Land Services and local Landcare groups, naturalist groups and many other community organisations.

NIC also advocated for the use of Commonwealth water in a productive agricultural system, in a controlled and managed way for environmental benefit and to potentially extend to broader community benefits through greater management of ecological outcomes. There is also opportunity to invest in the creation of habitat features within irrigation infrastructure. The construction of islands and mud flats within water storages and reuse system would see significantly improved habitat created from infrastructure that was primarily developed for productive purposes.

The *CEWH Framework for Investing in Environmental Activities Consultation Outcomes Report* (or interim report) released in early 2018 highlighted a range of potential projects, including issues relating to funding options that were raised during CEWH consultations. The key themes that emerged during the consultation included:

- the need for eligible projects under the framework to demonstrate enduring positive environmental outcomes,
- capacity building investment in regional communities including the need to increase community involvement in environmental watering, and
- that a range of funding options are available to cater for differing project types.

While we await the release of the final *CEWH Investment Framework* report, it is hoped it will provide opportunities for tangible, measurable and potentially scalable projects that involve collaboration between the CEWH and the multitude of groups suggested above.

Over and above what might emerge from the CEWH Investment Framework, the CEWH facilitates opportunities for local organisations, state governments and others to provide suggestions for the management, delivery and monitoring of Commonwealth environmental water. Individuals and groups within the Murray-Darling Basin are encouraged to submit suggestions for the use of Commonwealth environmental water. This includes, but is not limited to, catchment management authorities, not-for-profit organisations, community groups, Indigenous organisations, and landholders.

In terms of **current collaborations**, we draw the inquiry Committee's attention to the partnerships between Commonwealth, state and local government which are delivering environmental projects. NIC members are also working with the CEWH, the Commonwealth Department of Environment and Energy and state fisheries departments and local government on a range of activities designed to deliver environmental benefit.

Examples of such collaborations include:

Floodplain restoration in the Renmark Irrigation District: Renmark Irrigation Trust (RIT) is working with the Commonwealth Department of Environment and Energy on a five year partnership (from April 2016), the first of its kind between the CEWH and an irrigation water provider, which enables the delivery of Commonwealth environmental water to floodplains in the Renmark area using RIT's extensive irrigation infrastructure during the off-peak irrigation season (usually May to August).

Floodplains within the Renmark area in South Australia will be protected and restored under a Partnership Agreement between the CEWH and RIT. Environmental watering in the Renmark area can rehabilitate areas affected by salt from rising water tables, caused by past irrigation practices, and increase the abundance and health of vegetation and native fish populations, such as expanding areas of Black Box and restoring River Red gums. The project is using existing irrigation infrastructure to maximise the delivery of environmental water for the benefit of the environment and local community.

The partnership will restore Renmark floodplains and the plant and animal species it supports, while contributing to the maintenance of irrigation infrastructure. The partnership enables flushing of pipes during a time when irrigation demands are low and can foster recreational and tourism benefits by providing healthy and vibrant public places for walking, cycling and visiting – all while protecting and restoring floodplains. Under the Agreement, the CEWH will be treated as a RIT customer on an equivalent basis to existing irrigators.

Murray Private Property Wetlands Watering Program: Recognising that more than 80 percent of all wetlands in NSW occur on private land, the NSW Office of Environment and Heritage (OEH) works with landholders to identify and deliver ecological outcomes. The private property wetlands watering project commenced in 2001 and uses NSW held environmental water. Since its inception, flows have been delivered to over 200 wetlands within the Murray Irrigation district via the irrigation network.

The success of this project has led to the establishment of a program to provide flows into ephemeral creeks and streams throughout the Edward-Wakool Rivers system including the Tuppal Creek, Jimeringle, occurs in partnership with the CEWH utilising Murray Irrigation escapes to target flows without negatively impacting on productive farmland. Murray Irrigation escapes have also been utilised to deliver fresh, oxygenated water into the Edward, Wakool and Neimur Rivers during environmentally destructive hypoxic blackwater events.

Lyrup Forest Reserve Lagoon: A partnership between Central Irrigation Trust (CIT) in South Australia, Department of Environment, Water and Natural Resources SA, Nature Foundation SA, Local Action Planning, Water for Nature SA and the CEWH in 2015-16 enabled 200ML of Commonwealth environmental water in to induce a brine shrimp (Sea Monkey) bloom to attract large numbers of water birds to feed on the lagoon.

Lyrup Forest Reserve has been identified as a wetland of national significance – listed in the Directory of Important Wetlands in Australia by Environment Australia (*as part of the greater Gurra wetlands*). At times it has a high diversity of wetland fauna, including threatened birds such as Musk Duck, Threatened Duck, Royal Spoonbill, and the Peregrine Falcon.

Goulburn Trade Flows: is a collaborative project across agencies and river operators, including the MDBA, CEWH, the Victorian Environmental Water Holder, Goulburn Broken Catchment Management Authority and Goulburn–Murray Water.

A coordinated flow in the Goulburn River is supporting the movement of fish, while also meeting downstream irrigation and environmental demands. The water is being released to meet inter valley trade requests; river managers are also using the water to signal to young native fish in the River Murray to move upstream and into smaller streams. The project is an example of river operation that can meet the needs of both irrigated agriculture and the environment, and not one taking precedence over the other.

As part of the MDBA Basin-wide priorities to use environmental water to achieve long-term benefits, understanding of species such as gold perch and silver perch, for example, combined with knowledge around system-wide flows and the connectivity needed, is helping these species to thrive.

Burrendong dam thermal curtain: The temperature control curtain which has received national recognition, mitigates cold water pollution in the Macquarie river. The curtain allows warm water to be released from the surface of Burrendong dam to downstream, increasing surface water temperature in the Macquarie river. The initiative provides social, economic and environmental benefits and enables native fish populations a greater opportunity to thrive in warmer temperatures. When operational, economic benefits are derived from local fishing clubs being able to hold their major fishing events which deliver an economic boost to local communities. Local residents are able to make greater use of the Macquarie river and swim in the warmer waters.

3. Monitoring and evaluating outcomes of the use of environmental water

Under the Basin Plan, a long term average of 2750 gigalitres (GL) per year will be directed towards achieving the environmental objectives outlined, with potential for 450GL more if it can be delivered with positive or neutral socio economic impacts. As at 31 December 2017, an amount of **2106 GL** (or about 77% of the original target) has so far been recovered, which includes:

- 1227 GL purchased by tender
- 703 GL acquired by the Australian Government through infrastructure projects
- 162 GL state projects
- 15 GL from other sources (Australian Government)

In addition, through the Sustainable Diversion Limited (SDL) Adjustment Mechanism, the MDBA has assessed and determined an amount of **605 GL** through a suite of projects identified and put forward by Basin state governments. The purpose of the projects is to enable more efficient and flexible delivery of water. If the legislative instrument relating to the SDL projects, is agreed by the parliament, the additional water will be available for communities through the Mechanism. The projects will assist Commonwealth water to be used more effectively and represent less water having to be recovered. Projects include initiatives such as:

- removing physical constraints or barriers to environmental water flows
- putting in place protections for environmental water flows (called shepherding) and other state regulations to make environmental water use more effective
- putting in place infrastructure and projects that deliver the same environmental outcomes with less water (supply measures)
- changes to river operating rules
- better methods to account for environmental water
- agreement to not substitute environmental water that was planned or held by states before the Basin Plan.

The CEWH website, and the graph below ⁵, tells us that since the 2008-09 year to 31 January 2018, over 7,999 GL of Commonwealth environmental water has been delivered to rivers, wetlands and floodplains of the Murray-Darling Basin.

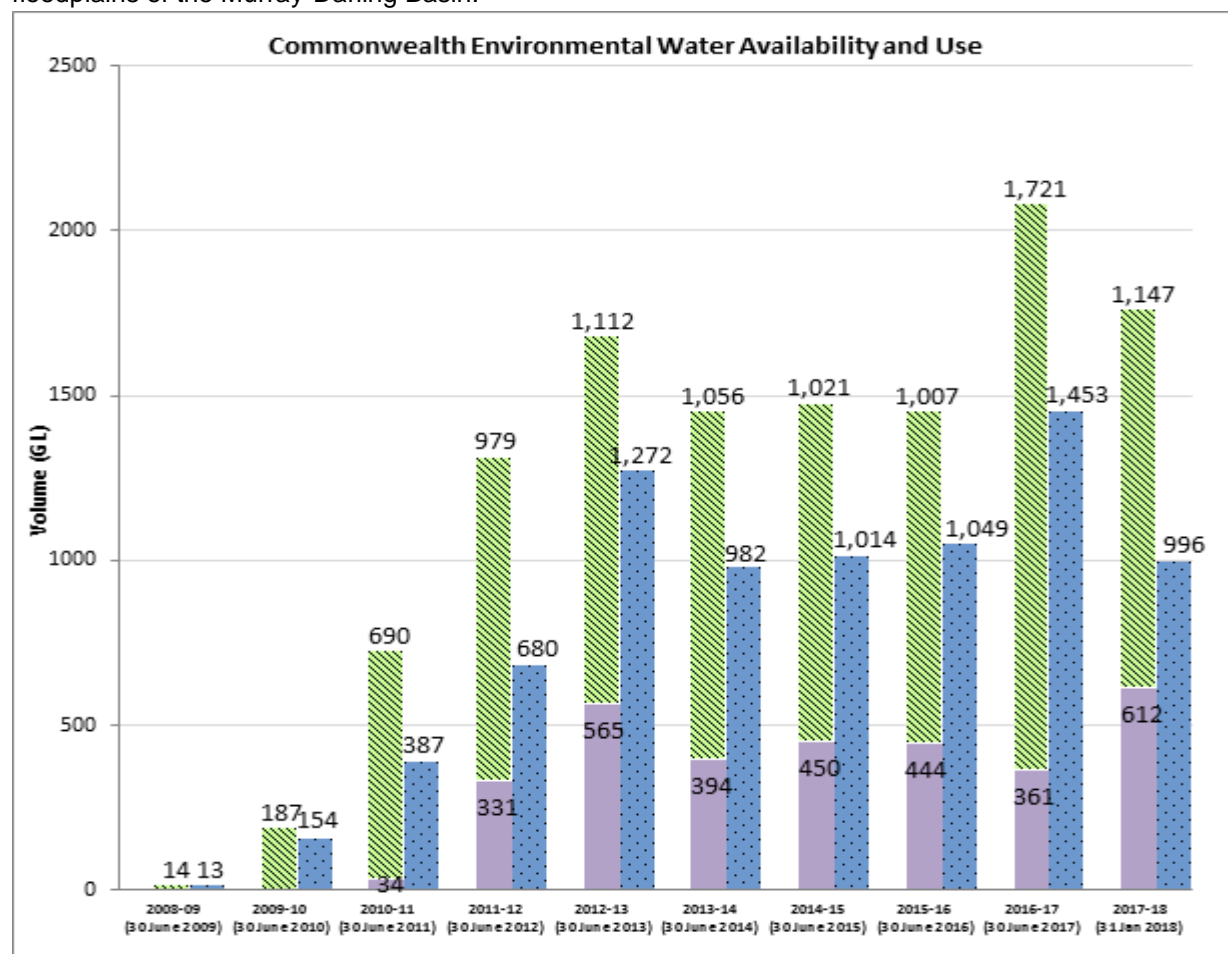


Table 2: Commonwealth Environmental Water Availability and Use

On a yearly basis the MDBA determines its environmental watering priorities across the Basin in consultation with the CEWH, Basin state governments and local authorities. The process is designed to complement local, regional and state priorities. It is underpinned by the Basin wide environmental watering strategy which assists environmental water holders, Basin state governments and waterway managers plan and manage environmental watering at a Basin scale and over the long term to meet the environmental objectives.

The MDBA tells us that to achieve the objectives of environmental watering the following strategies are being implemented:

- harnessing local community land and water knowledge
- management of all water to benefit the environment where possible—such as cooperating to divert consumptive water deliveries through a wetland en-route
- management in harmony with biological cues (including responses to flow) to restore elements of a more natural flow regime—as an example, high river flows or a flow release into a wetland at times when it would naturally have occurred prior to river regulation, so as to trigger fish or bird breeding
- coordination to achieve the best outcomes and target multiple sites with deliveries of water (in and between rivers), where possible
- management of any risks associated with the delivery of environmental water

⁵ Department of Environment and Energy website: About Commonwealth Environmental Water

- applying adaptive management (learning from doing) when planning and prioritising the next use of environmental water.

NIC cautiously welcomes the results of the 2017 MDBA evaluation of the first five years of Basin Plan implementation which has shown early signs of environmental improvement where significant ecological benefits from Commonwealth environmental water are being observed. Examples from the evaluation reveal:

- over the past year the largest Murray cod spawning event has occurred in twenty years, and
- the first recorded pelican breeding was also observed at Nimmie-Caira.
- improved protection of threatened species such as the southern bell frog and the Murray hardhead fish through improved wetland and river health.

The evaluation notes that some areas of aquatic vegetation, which supports fish and birds, have recovered to levels not seen since before the millennium drought. The evaluation recommends however, that Basin governments should continue with full implementation of the Basin Plan by 2024, recognising that the management of constraints and implementation of all aspects of the SDL Adjustment Mechanism (605 GL suite of projects) are critical to getting the best possible environmental outcomes. In terms of the SDL projects, the evaluation recommends that Basin governments must involve Basin communities in the design, implementation and delivery of the nominated projects *to build community understanding and acceptance of the projects*.

NIC agrees with the fundamental point made in the MDBA review that environmental recovery will take a considerable length of time and it is far too early to judge success or more importantly to say it has failed.

Importantly, the evaluation has recommended that Basin governments and the MDBA should review Basin Plan reporting to assist environmental water planning and management.

Notwithstanding the MDBA evaluation and these early environmental improvements, we remain concerned about the apparent cumbersome governance arrangements and **duplication in the management of environmental water**. We have previously commented on the importance of clarifying the roles and responsibilities of the numerous government agencies involved in water planning, monitoring, metering and evaluation. There is opportunity to examine current governance arrangements, which cause confusion around the roles and responsibilities of the government agencies involved at a state and federal level (not to mention the cost to taxpayers). This is demonstrated in the context of the annual environmental watering priorities where the CEWH, MDBA and states all appear to have their own versions. Aligning language and frameworks might be a good start.

We suggest that one Commonwealth agency should control environmental water planning, delivery, monitoring, metering and evaluation. As the CEWH has responsibility for managing Commonwealth environmental water, it would make sense for this agency to assume this responsibility. Duplication can be avoided by supporting a single well-resourced environmental water manager, the CEWH, responsible for delivery, planning, metering and monitoring capacity within the Basin acting with regard to the Basin-wide environmental watering strategy developed by the MDBA.

Monitoring is important in terms of being able to identify the additional benefits from Basin Plan environmental watering, as opposed to what would have occurred as a result of environmental water provisions already contained in existing Water Sharing Plans. Generally, intervention monitoring provides information on what impact the e-watering has had, while condition monitoring shows the overall picture, regardless of the cause. The strengths of weaknesses of the current monitoring should be identified if future monitoring is going to better contribute to effective e-water management.

NIC would point out that in any future environmental water management it is critical that we have, as far as possible, local management and input into decision making.

Productivity Commission inquiry into National Water Reform

Again, we draw the inquiry Committee's attention to the Productivity Commission's September 2017 draft report⁶, as part of its inquiry into National Water Reform, where the Commission made a series of observations and recommendations reflecting much of NIC's long held advocacy. This relates to evaluation, auditing and reporting on progress on the allocation of environmental water to give confidence to communities and broader stakeholders that demonstrate in a transparent way, local and regional environmental achievements as a result of environmental watering.

Also worth detailing are the Commission's targeted findings at draft recommendation 5.6:

Australian, State and Territory Governments should improve monitoring, evaluation, auditing and reporting to demonstrate the benefit of allocating water to the environment, build public trust in its management, keep managers accountable and make better use of environmental water over time.

Priorities are:

a. Australian, State and Territory Governments should increase their focus on monitoring environmental and other public benefit outcomes — not just flow delivery — where additional effort would be commensurate with the risk to, and value of, those outcomes

b. monitoring and evaluation should involve collaborative and complementary partnerships, consistent methods that enable the synthesis of outcomes across different temporal and spatial scales, and long-term investment. In the Murray-Darling Basin, governments should develop a strategy to coordinate monitoring and evaluation of the outcomes of environmental flows, both planned and held

c. all managers of environmental flows should publicly report on whether outcomes have been achieved or not, and the reasons why

d. Australian, State and Territory Governments should establish arrangements for independent auditing of environmental flow outcomes to support transparency

e. managers of held environmental water should use the results of monitoring, evaluation and research to improve water use as part of an adaptive management cycle. To achieve this, managers should clearly allocate responsibility and provide adequate resourcing for adaptive management.

The Commission made other observations, noting: *'there is some evidence of improved ecological outcomes from increased environmental flows, but it will take time for the full benefits to be realised'*.

The Commission also observed the need for active management of environmental water and a recognition that *'the discipline of environmental water management is still in its infancy'*.

The Commission noted *'the benefits of water reform are starting to be realised. While ecological restoration is a long-term process, the benefits of having more water available for the environment are being realised. Environmental flows have contributed to better outcomes for native fish, frogs and waterbirds, while also improving native vegetation condition and helping to maintain water quality (Argent 2017; Watts et al. 2016)'*.

The Commission further observed the need to ensure that environmental water assets should be managed efficiently and effectively to maximise environmental outcomes and that they should seek to provide additional community outcomes relating to water quality, indigenous values, recreation and economic benefits where possible.

⁶ Productivity Commission draft report: National Water Reform, September 2017

The Water Act requires an annual report on the management of environmental water be provided to the relevant Commonwealth and State Water Ministers. The report must include information on achievements against the objectives of the Basin Plan's Environmental Watering Plan. In a submission to the 2014 Basin-wide Environmental Watering Strategy (the Strategy), NIC highlighted the need to better understand, the key objectives to be achieved through environmental watering, for example:

- Against what baselines will objectives be measured?
- How will objectives be reported?
- How will they guide future decision making?
- How will local stakeholders be engaged?

The Strategy is intended to help environmental water holders, Basin state governments and waterway managers plan and manage environmental watering Basin-wide, and over the long term, to meet the environmental objectives. Other elements of the planning process include long-term watering plans and water resource plans (consistent with the Strategy) prepared by Basin states for each region. The Strategy sets out the MDBA's best assessment of how **four important components** of the Basin's water-dependent ecosystems are expected to respond over the next decade, under current operating rules and procedures. The four components which indicate the health of river systems include: river flows and connectivity; native vegetation; waterbirds; and native fish.

Water resource plans, currently in development by Basin states, will establish the rules and arrangements around issues such as annual limits on water take, environmental water, managing water during extreme events and strategies to achieve water quality standards and manage risks. Basin states will submit their water resource plans to the MDBA for assessment. The plans are designed to align Basin-wide and state-based water resource management to provide sustainable limits for the water resources of the Murray–Darling Basin. Water resource plans must be accredited by mid-2019 and reviewed by the Minister for Agriculture and Water Resources. The MDBA evaluation suggests that Basin governments and the MDBA must 'redouble efforts' to ensure all water resource plans are in place by June 2019.

As we have consistently argued, in implementing the Basin Plan, objectives must focus on outcomes, rather than flow targets. The Productivity Commission's conclusions in this area are very welcome as are comments and recommendations regarding bottom-up management and integration of waterway management. Local knowledge is a key part of the effort to achieve healthy river systems. NIC members have consistently expressed concern about turnover of staff dealing with environmental water planning and/or those staff being remote from the on the ground knowledge.

There is substantial benefit to be gained for the environment in working closely with private landholders and local community groups who understand the behaviour of waterways and understand how water could be used to improve ecological outcomes. In this context, it is hoped the [CEWH Investment Framework](#) when it is released, will provide such opportunities.

State government catchment based organisations (like CMAs) will be well positioned to provide a vehicle for a bottom up planning approach. NIC notes Productivity Commission endorsement of the Victorian model, which provides the potential structure required; we would hope that other states might follow suit with similar models which reflect localism in planning.

4. Options for improving community engagement and awareness of the way in which environmental water is managed

Improved environmental outcomes can be achieved by engaging local people, who are based in catchments, who have water knowledge and are able to work with environmental water planners to identify initiatives that make full use of opportunities on public and private land.

Environmental Water Holders (state and federal) must work with local stakeholders to outline the specific objectives they want to achieve out of their environmental water portfolio for each valley in which water is held, reflecting the 'localism' approach. Objectives must be based on clearly defined ecological and hydrological baselines. Baselines must be evidence based and publicly available.

We welcome the current approach of the CEWH in acknowledging the importance of local information and experience in being able to effectively manage and deliver Commonwealth environmental water. This expertise, local knowledge, advice and feedback provided by various groups including regional advisory groups, state environmental water holders, river operators, land service groups, catchment management authorities, scientific expertise and landowners who invite us to participate in their processes, and the many landowners who work with us to plan, manage and monitor the use of environmental water in the Basin.

The interface between CEWH local engagement officers, appointed by the CEWH, and state and local land and water management officers enables outreach within local Basin communities.

The *CEWH Investment Framework* (detailed earlier) is a further opportunity for community engagement and awareness in the management of environmental water. We look forward to the Framework facilitating closer engagement between the CEWH, through local engagement officers, and communities. We expect as a result, collaborative partnerships in the effort to identify potential projects designed to deliver positive environmental outcomes for community and broader benefit.

5. Any other matter of relevance that the committee wishes to consider

Protection of environmental and low flows

We note that in early evidence to the committee and in media coverage, the issue of protection of environmental flows has been raised. We agree that this is an important issue. In particular, we note that low flows in the Barwon Darling are critical for downstream communities and users.

It is important for the committee to recognise that this problem does not affect the vast majority of environmental flows in the Murray Darling Basin. Most of the Basin's water is in regulated rivers and these rivers do not (generally) have the type of licenses that are involved in the problems outlined.

It should also be clear that legal interaction of some licenses on unregulated rivers and environmental flows does not constitute theft.

NIC has zero tolerance for any illegal water take, whether that is by an irrigator or anyone else. Irrigators pay large sums of money for water; it is a substantial input cost of their business and if another producer is taking water then it not only undermines the integrity of the system, but it harms other water users and gives an unfair business advantage. We have made numerous public statements on this indicating support for effective compliance regimes and for implementation of the independent recommendations made in a range of reports into the issues.

Irrigators pay substantial contributions from their fees for compliance. It is Government's role as the regulator to enforce the rules, and industry has consistently called for more effort in that area – and indeed, for the funding which comes from the sector to be used appropriately to do the job.

The issue of legal take of environmental water is quite separate to illegal take. It occurs in unregulated rivers where licences exist that allow pumping when the river reaches certain levels. These licences pre-date the Basin Plan, and in many cases they pre-date Government's owning environmental water. They reflect rivers which do not have storages and have extremely variable flows. Again, for clarity, most of the rivers in the Basin are regulated, which means they have dams or water storages.

The licences in question were established when the only flows coming down the river were from nature. An irrigator, for example, may have a licence that specifies that they can turn their pump on when the river is a certain height or volume and they have to switch it off again when it falls below that level. The problem is when that height is reached because the environmental water holder has released water from a regulated river with the intention of that flow reaching down the unregulated river.

The usage rules for these classes of licences were in place when the Commonwealth purchased environmental water in the Northern Basin. The Commonwealth was well aware of the interaction and the way these rules worked when they made those purchases.

Despite this, we acknowledge this problem and the need to address it. We would point out though that where a property right is to be changed it should be done in full consultation with the owners of the right. Many of the irrigators affected by this have for some considerable time been willing to discuss solutions with the Government. Any solution must be equitable, and it must ensure the integrity of all water entitlements and apply equally.

NIC also acknowledges concerns expressed by communities about low flows in the Darling. We note that this issue is a key part of the NSW Government's water reform proposals, currently out for community consultation. That proposes expanding the Minister's ability to protect flows.

NIC does not disagree with the NSW Government proposal in principle, however we would say that there should be transparent and clear operational guidelines around this so that all interested parties can be clear about what components of flow come from particular sources. It also must be clear that if decisions reduce the reliability of a legally obtained entitlement that will have a financial impact on a business and that may need to be compensated.

While we are happy to work with Government on the protection of environmental flows in unregulated rivers, it is important to point out that there should be no change to the characteristics of different types of water right. In this context, water owned by a commercial irrigator has exactly the same characteristic and right as the same type of water owned by the Government. For example high security water owned by the CEWH in a valley is the same as high security water owned by an irrigator. One does not get priority over the other either in the allocation or in delivery.

We strongly endorse the principles regarding measurement and metering set out in the recent reviews including metering of all pumped water and measurement of water take from overland flows. Irrigators are working cooperatively with Government to ensure the implementation of these principles is effective and practical.

About the National Irrigators' Council

The National Irrigators' Council (NIC) is the national peak body representing the irrigated agriculture sector in Australia. The organisation supports 32 member organisations covering the Murray Darling Basin states, irrigation regions and the major agricultural commodity groups. Council members collectively hold approximately 7,000,000 mega litres of water entitlements.

The national body is the policy and political voice of those who use water for commercial agricultural purposes, producing food and fibre for local consumption as well as making a significant contribution to Australia's export income.

NIC is funded by irrigators, for the benefit of irrigated agriculture which provides jobs in rural and regional communities. Members are not individual irrigators but members of their respective representative organisations. An irrigator is defined as ‘*a person or body with irrigation entitlement for commercial agricultural production*’.

Member organisations are located in irrigation regions across Australia within the Murray-Darling Basin and beyond. They represent a diversity of organisations from irrigation infrastructure operators, individual irrigators; processors through to agricultural commodity groups who produce and value add food and fibre for domestic consumption and significant export income.

NIC advocates on behalf of irrigated agriculture and aims to develop projects and policies to ensure the efficiency, viability and sustainability of Australian irrigated agriculture and the security and reliability of water entitlements. NIC advocates to governments, statutory authorities and other relevant organisations for their adoption.

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NIC Guiding Principles

NIC objectives are to:

To protect or enhance water as a property right and to champion a vibrant sustainable irrigation industry.

NIC is the voice of irrigators and believes in the following principles to guide future policy decisions:

- A healthy environment is paramount
 - Sustainable communities and industries depend on it
- Protect or enhance water property rights.
 - Characteristics of water entitlements should not be altered by ownership
- No negative third party impacts on reliability or availability
 - Potential negative impacts must be compensated or mitigated through negotiation with affected parties.
- Irrigators must be fully and effectively engaged in the development of relevant policy.
- Irrigators expect an efficient, open, fair and transparent water market.
- Irrigators require a consistent national approach to water management subject to relevant geographical and hydrological characteristics.
- Irrigators expect Government policy to deliver triple bottom line outcomes.
- Regulatory and cost burdens of reform must be minimised and apportioned equitably.

ⁱ Vilizzi, L., Tarkan, A.S. and Copp, G.H., 2015. *Experimental evidence from causal criteria analysis for the effects of common carp Cyprinus carpio on freshwater ecosystems: a global perspective*. *Reviews in Fisheries Science & Aquaculture*, 23(3), pp.253-290.

ⁱⁱ Lugg, A. and Copeland, C., 2014. *Review of cold water pollution in the Murray–Darling Basin and the impacts on fish communities*. *Ecological Management & Restoration*, 15(1), pp.71-79.

ⁱⁱⁱ http://www.depi.vic.gov.au/data/assets/pdf_file/0013/282001/Murray-River-resnagging-fact-sheet-2014.pdf