

Select Committee on the Murray–Darling Basin Plan

Murray–Darling Basin Authority response to questions on notice

Question 1

What rule changes, changes in operating procedures and/or pre-requisite policy measures does the MDBA need to have in place in the context of the Constraints Management Strategy?

Answer:

- Basin governments asked the MDBA to develop a Constraints Management Strategy in their joint comments on the draft Basin Plan. Implementation of the Strategy is an opportunity to improve the efficient and effective operation of the river system. The Constraints Management Strategy was released by the MDBA on 1 December 2013.
- That said, the Basin Plan was designed to operate effectively without any new constraints measures being taken. The MDBA does not ‘need’, nor does the Basin Plan require, any particular additional constraints measures to be in place.
- The so-called prerequisite policy measures are relevant to the calculation of the supply contribution of the Sustainable Diversion Limit adjustment mechanism, and are not related to constraints management. Their implementation will be crucial to provide for an adjustment to the extraction limit as a result of the operation of the mechanism.

Question 2

MDBA continues to rely on river flow modelling parameters that are in some cases at odds with existing knowledge of maximum flow rates if third party impacts are to be avoided. How will the MDBA address this?

Answer:

- Modelling has been used extensively in the past for planning for the future management of the Murray–Darling system as it is preferable to real time experimentation. Modelling allows different scenarios to be explored without exposing river users to unnecessary risks. Of course models are only an estimate of the real system. The complexity and competence of the models and the river flow modelling parameters and other assumptions used within them change over time as conditions change and as knowledge improves.
- The MDBA has changed the modelling assumptions it uses. For example in 2013 the Basin Officials Committee determined that a maximum regulated flow constraint of 18,000 ML/day be established downstream of Yarrawonga Weir in response to landholder knowledge and concerns about the impacts of higher flow rates. When the modelling was undertaken during the preparation of the Basin Plan in 2012 this flow constraint was not in place.
- It is important to understand that the MDBA’s models are used for a variety of purposes. For example, when investigating potential changes to the environmental outcomes used in setting the Basin Plan that might arise from changes to river operating constraints the MDBA must necessarily compare against the original modelling that was used. However, when

investigating the potential impacts on landholders that might arise as a result of constraints proposals put forward by Basin governments the MDBA uses the current rules.

Question 3

Can you summarise the current status of salinity levels in the Basin compared to salinity levels at the implementation of Salt Interception Schemes?

Answer:

- The Salt Interception Schemes reduce salinity levels in the main stem of the rivers and in the local land areas where they are located. They have no effect in reducing salinity levels of other landscapes of the Basin.
- The average salinity levels in the main stem of the river have decreased since the late 1980s as Salt Interception Schemes were progressively commissioned (1988 to 2014) and improved land and water management practices were adopted. The modelling work carried out for the recently released Basin Salinity Management 2030 strategy indicates that the 95 percentile salinity level at Morgan, South Australia, has reduced from 1058 EC to 721 EC (by about 337 EC) between 1988 and 2015 as a result of continuation of salinity control measures currently in place. The river water is at an acceptable salinity level for agricultural and industrial use and maintaining this status will require ongoing active management.

Question 4

Can you advise if the Salt Interception Schemes are currently running at optimum levels? If not, why not?

Answer:

- Yes. Until 2013/14 all salt interception schemes were operated to their full design capacity maximising the amount of salt prevented from entering the River Murray. The 2014 General Review of Salinity Management identified the potential to reduce the level of salt interception operations during periods of low salinity risk and thereby save on operating costs. This approach has been accepted by all partner governments through the approval of the Basin Salinity Management 2030 strategy (November 2015). Optimising the operation of salt interception schemes is now based on assessing the salinity risk outlook and adjusting the level of operation accordingly. This is a relatively new approach and the tools with which salinity risk is forecast continue to be refined. For now, a conservative approach to reduced scheme operation is being adopted to limit the likelihood of higher than desirable river salinity occurring while still achieving some cost saving against a benchmark of full operation of all schemes.

Question 5

The MDBA has stated that native fish are one of the four key indicators used to evaluate the health of the Basin. Previously you have identified that cold water pollution has a significant adverse impact on native fish populations. Many studies support this conclusion. Can you advise what steps the MDBA have taken to eliminate the effects of cold water pollution on native fish populations to enable successful spawning?

Answer:

- Cold water pollution is an issue associated with some dams, especially where water is discharged from the bottom of storages. These dams are state-owned and the management of cold water pollution is primarily a state government responsibility.
- The MDBA published the Basin-wide environmental watering strategy in November 2014 which highlighted that, to achieve improved native fish environmental outcomes, environmental water holders and managers will need to manage water quality risks, including cold water temperatures, through long-term watering plans, water resource plans and delivery (including river operations).
- As a specific example of the MDBA's actions, in June 2014 the MDBA published a Basin annual environmental watering priority for 2014/15 which aimed to improve native fish habitat within the Macquarie River below Burrendong Dam by restoring a more natural flow regime and addressing cold water pollution. This priority was made possible by the New South Wales Government's installation of offtake works on Burrendong Dam that enabled warm, oxygenated water to be discharged from the top of the impoundment. Environmental water was released consistent with this priority during 2014-15 and supported native fish migration and spawning as well as improved recreation outcomes for downstream users.

Question 6

In 2014 94% of the river red gum forests and woodlands in the icon site of the Barmah-Millewa forest were found to be in good to moderate condition. Is this an indicator of improved environmental conditions due to environmental watering or flooding or both?

Answer:

- Stand Condition in the Barmah-Millewa Forest was reported in two documents:
 - MDBA (2015) Stand Condition Assessment of Forests and Woodlands of Barmah Forest – 2014
 - MDBA (2015) Stand Condition Assessment of Forests and Woodlands of Millewa Forest – 2014
- The 94% appears to be an area weighted average which is close to the totals for both the Barmah and Millewa – the above reports state that in 2014 the condition of the forests and woodlands in these areas were as follows:
 - Barmah Forest: 37.6% (9,812 ha) was in good condition and 59.7% (15,577 ha) was in moderate condition
 - Millewa Forest: 21.4% (6,769 ha) was in good condition and 69.3% (21,927 ha) was in moderate condition
- It is important to note that these statistics do not represent the condition of all of the vegetation communities in these forests. For example the MDBA is aware that some other important vegetation communities requiring sustained higher flows through the forest are in poor condition (e.g. Moira grass).
- The forest and woodland condition at any site is a function of a number of factors including the timing and duration of natural flooding, environmental watering and the impact of other flows (e.g. irrigation water on-route).

Question 7

The MDBA has previously stated that the condition of the Macquarie Marshes has been declining for decades. This is despite numerous environmental watering events. Is it a fact that much of the environmental water intended for the marshes is diverted via levees onto privately owned floodplains and this has been known for years?

Answer:

- The decline in extent and condition of the Macquarie Marshes is well documented¹²³⁴, with less than 50% of the original extent of the Marshes remaining.
- Key factors driving this decline are reductions in flow size, frequency and duration associated with water resource development, and diversion structures (dams, levees, channels, instream structures) that have collectively impacted on natural flow patterns in the system. In this regard, the Macquarie Valley and the Macquarie Marshes are similar to many other floodplains in the Basin.
- Monitoring of environmental flow events undertaken by the New South Wales Office of Environment and Heritage⁵ indicates that environmental water is reaching its intended target areas in the Macquarie Marshes, including on both private and public land.

Question 8

What is the estimated dollar value of environmental water used to water private property during environmental watering events at the Macquarie Marshes?

Answer:

- Environmental watering in the Macquarie Marshes is managed by the New South Wales Office of Environment and Heritage, and their management of the water aims to achieve identified environmental objectives on both public and private land.
- The MDBA is not aware of any estimates of the dollar value of environmental water used on private land. It would be difficult to accurately estimate the volume of water retained on private land and to subsequently place a dollar value on that watering. Such an estimate would also need to take into account the contribution to the environmental outcome being sought by the delivery of the water.

¹ Kingsford, RT and Thomas, RF, 1995. The Macquarie Marshes in arid Australia and their waterbirds: A 50 year history of decline, *Environmental Management* 19(6): 867-878

² Kingsford, RT and Johnson, WJ, 1998. Impact of water diversion on colonially-nesting waterbirds in the Macquarie Marshes of arid Australia, *Colonial Waterbirds* 21(2): 159-170

³ Bacon, P, 2004. Macquarie Marsh River Redgum Health Survey, Department of Environment and Conservation, Sydney

⁴ Department of Environment, Climate Change and Water, 2010a. Macquarie Marshes adaptive environmental management plan, Department of Environment, Climate Change and Water, Sydney

⁵ Office of Environment and Heritage, 2012. *Macquarie Marshes Ramsar site; Ecological character description, Macquarie Marshes Nature Reserve and U-block components*, Office of Environment and Heritage, Sydney

Question 9

In answer to a question from the Chair to the MDBA during the September briefing of the committee, it was stated “In effect a natural estuary no longer existed once upstream regulation and water extraction started. By 1902 South Australia was raising concerns with upstream states about this.” Can you advise the level of regulation and water extraction in effect in 1902 to which you refer?

Answer:

- By 1902, there had been substantial irrigation development in the Goulburn Valley, enabled by diversions from the Goulburn Weir at Nagambie. In addition, there was also irrigation development at Mildura, Wentworth, Renmark and various smaller settlements, particularly in South Australia.
- MDBA records indicate about 2,000 GL of development had occurred by 1922. Extrapolating back in time it is estimated that diversions by 1902 would have been in the range of 500 to 1,000 GL per annum.
- While this level of development might appear to be modest, without major upstream storages, diversion would have been taken from natural river flows which are typically lowest during summer when irrigation demand is highest. It is when flows to the sea are lowest that the estuary would extend the furthest into Lake Alexandrina.
- In dry years, before major storages were constructed, it was possible for irrigators to pump the river dry, which is supported by photos from the early 1900s.

Question 10

In 2002 and again in 2006/07 very significant bushfires burnt large areas of high water yield forested MDB catchment. What was the effect of the 2006-07 bushfires on inflows to the Basin?

Answer:

- The MDBA and CSIRO undertook a study⁶ after a bushfire event in 2002. This study suggests:
 - An initial increase of system inflow of more than 14% until about 2010 due to reduced ability of soil to soak up rainfall after fires
 - After this period, a small reduction in the total inflows compared with the no fire scenario, as juvenile trees grow
 - Changes in inflows will vary significantly depending on severity of fire and tree death
- A separate study has not yet been done to quantify the effect of the 2006-07 fires.

Question 11

What is the long-term average inflow to the Murray River and its major Victorian tributaries in the areas adversely affected by the 2006/2007 fires?

⁶ Van Dijk, A. et.al, 2006. *Risks to the Shared Water Resources of the Murray–Darling Basin*, Murray–Darling Basin Commission, Canberra

Answer:

- Long-term average inflow to the Murray River from 1970 to 2015 is 9,099 GL/yr. The inflow to the Murray River is the total of:
 - inflows to upper Murray (Dartmouth and Hume Dam)
 - Kiewa River @ Bandiana
 - Ovens River @ Peechelba
 - Goulburn River @ McCoys Bridge
 - Broken Creek @ Rices Weir
 - Campaspe River @ Rochester
 - Loddon River @ Loddon Weir
 - Billabong Creek @ Darlot
 - Murrumbidgee River @ Balranald

Question 12

What was the inflow to the same rivers in 2007 and 2008?

Answer:

- In 2006-07, inflow to the Murray River was 1,017 GL.
- In 2007-08, inflow to the Murray River was 2,069 GL.
- These inflows exclude water delivered from tributaries as inter-valley transfers.

Question 13

What modelling has the MDBA done to estimate the increases in inflows that will result from vegetation regrowth stabilisation following the 2006 bushfires in the Alps?

Answer:

- In general, the development of hydrologic and rainfall run-off models includes calibration to historical data. During this process, model parameters are modified to best replicate historical patterns. Therefore the long run impacts of bushfires, which occurred during the calibration period, are implicitly accounted for in the modelling process. The MDBA has not attempted to quantify the change in flows arising from the 2006 bushfires in the Alps.
- A number of key settings in the Basin Plan, including sustainable diversion limits, were based on judgements formed after careful consideration of a range of information, including modelling about the environmentally sustainable level of take, the historical climate conditions (July 1895 to June 2009) and social and economic analyses.

Question 14

Now that the Plan is being implemented on what scale do you see the MDBA role continuing?

Answer:

- The MDBA has ongoing functions and powers as set out in the *Water Act 2007* (Cwth). Full implementation of the initial Basin Plan will take until 2024. There will be an ongoing cycle of 10 yearly reviews that the MDBA must then undertake, and states must adopt. These

reviews will need to be informed by best available information, including an ongoing commitment in the interim to monitoring and evaluation.

- The cyclical nature of this work means there may be some capacity to temporarily reduce resourcing for the MDBA once the 36 state water resource plans are accredited (expected in mid-2019) and before the review of the Basin Plan commences.
- The MDBA's operation of the River Murray System on behalf of the joint Basin governments is also an enduring task that requires ongoing resourcing to ensure that jointly owned infrastructure such as Hume and Dartmouth dams can be operated safely and efficiently.

Question 15

The Committee has heard evidence that the activities of the Commonwealth in buying water in Victoria, both before and after the Basin Plan was signed, has “effectively undermined the viability of Goulburn Murray Water” and many of its customers. How is this reconciled with the social and economic obligations of the Plan?

Answer:

- Water purchase is the responsibility of the Commonwealth Department of Agriculture and Water Resources. Management of the operation of Goulburn Murray Water is a responsibility of the Victorian Government and this question is best directed to the two governments.

Question 16

What guidelines or strategy did the MDBA employ to ensure that implementation of the Plan or MDBA activities did not unduly adversely affect important entities like GMW, Murray Irrigation or similar, or similarly affect particular townships or communities?

Answer:

- The Basin Plan and associated reforms are a whole of government initiative supported by Basin governments via intergovernmental agreements. The premise behind the reforms is that recovery of water to achieve a more economically, environmentally and socially sustainable river system would be achieved through purchases in the water market or through investments in water efficiency projects. This was a cornerstone of the Commonwealth Government's \$10 billion national plan for water security announced in 2007. Additional measures to reduce impacts from the reforms include the improved operation of water markets, the facility for charging exit fees, the 1500GL cap on water purchasing, and the decision to transition to the new diversion limits over a period of twelve years from the time the reform was initially announced, allowing industry and communities time to adapt to the changes.
- The sustainable diversion limit adjustment mechanism and the northern Basin review offer further opportunities to reduce the adverse impacts of the Basin Plan. The Commonwealth Government has also made available significant funding to assist Basin communities with the adjustment process.
- The MDBA's work under the Basin Plan is in line with the requirements of the *Water Act 2007* (Cwth) to provide for integrated water management of Basin water resources in a way that optimises social, economic and environmental outcomes.

Question 17

What is the current MDBA estimate of job losses in the Basin associated with the reduction in irrigation water?

Answer:

- The most recent reliable employment data available from the Australian Bureau of Statistics at the Basin scale is from the 2011 Census, undertaken prior to the finalisation of the Basin Plan. Therefore, no conclusions about the effects of the Basin Plan on job losses in the Basin can yet be drawn.
- At the time of the finalisation of the Basin Plan it was estimated that the impact on jobs would be in the order of 1,600 fewer jobs by 2019. However, this estimate was based on modelling to identify the change likely caused by the Basin Plan if all other factors remained constant.
- The MDBA has a responsibility to report on the economic and social effects of the plan by 2017 and is currently collecting information and identifying overall trends and changes happening in Basin communities and industries, before identifying the effects of the Basin Plan.
- While the MDBA cannot put a precise estimate on the economic and social consequences of the introduction of the Basin Plan now, it is clear that the scale of the reform will have both significant positive and negative effects on the Basin economy and society. These effects will vary over time and will vary across the Basin reflecting the vulnerability or resilience of Basin towns and communities. The impacts will also vary dependent on other factors that are driving specific industry sectors and regions within the Basin (such as seasonal weather conditions, exchange rates, international and domestic demand and supply for particular commodities, energy prices, investor confidence and broader demographic and technological change).
- Prior to the Basin Plan, between 2001 and 2011, there was a 26% decrease in the number of jobs in the agriculture, forestry and fishing industries in the Basin. This was a likely result of multiple factors and trends that pre-date the Basin Plan, including drought conditions and changes in farm practices and farm sizes. However, increases in the number of jobs in other Basin industries, such as education and training and health care and social assistance, led to a total increase of 12% in the total number of jobs in the Basin and a shift to a more service-orientated economy. It is likely that multiple factors will have continued to influence employment in the Basin post 2011 and the Basin Plan is one additional contributing factor.

Question 18

What improvements to the management of the Lower Lakes and the Coorong have occurred since the end of the Millennium drought?

Answer:

- Since the end of the millennium drought, Basin governments and the MDBA have:
 - agreed to, and published the 2014 Drought Emergency Framework for Lakes Alexandrina and Albert
 - removed emergency works at Narrung, Clayton and Currency Creek
 - implemented Lower Lake level cycling subject to availability of water
 - maintained continuous releases through barrages for five years sustained by a combination of unregulated flows and environmental water
 - constructed a new fishway at Boundary Creek

- been dredging the Murray Mouth since January 2015
- In addition, the South Australian Government published *Securing the Future: A long-term plan for the Lower Lakes, Coorong and Murray Mouth* in June 2010.

Question 19

How do you explain the assertion in many submissions and oral evidence that the outcomes and reports from MDBA meetings with advisory committees or the community are in conflict with the discussions actually conducted at those meetings?

Answer:

- We regret that some submissions to the inquiry have made this claim. The MDBA is strongly committed to transparently reporting community feedback, and has taken great trouble to ensure that records accurately reflect the views of stakeholders.
- For example, the MDBA initially led consultation in relation to constraint management measures. The MDBA provided the minutes of meetings to committee members to confirm records and cross-checked information where possible before it was included in advice to Basin states. In particular, we provided stakeholders multiple opportunities to review individual reach reports before they were finalised and published on the MDBA website. Where community members have expressed concern about flows, the MDBA has consistently stated this to be the case in a frank manner, including publishing direct quotes in reports, such as the following quote from a landholder representative in the Hume-Yarrawonga reach report which was first published in November 2014:

“40,000 ML a day is still unacceptable to most of us — anything above that is completely unacceptable to all of us”. Murray River Action Group representative
- The MDBA acknowledges that the scale of the changes required to implement the Basin Plan is large and there are and will be many different views as to how best to achieve the objectives of the Plan efficiently and fairly. In this environment it will be vital to ensure that the MDBA engages stakeholders effectively.
- Stakeholder participation and involvement is critical to the enduring and successful implementation of the Basin Plan. The MDBA welcomes any suggestions stakeholders may have as to how we may improve our policies and practices for engaging the many stakeholders across the Basin.

Question 20

How would you describe community acceptance of the Plan in the southern Basin?

Answer:

- There are mixed views in the southern Basin about the Basin Plan and other water reforms.
- Some people do not support the Basin Plan at all and strongly believe that there is no need to put in place reforms to ensure the economic, environmental and social sustainability of the river system.
- On the other hand, some people tell us they strongly support the Basin Plan and recognise the importance of protecting the rivers that sustain Basin communities and industries. For example, some landholders would like to see the return of an extra flow every few years or so into creeks and flood runners on their properties through the constraints work.

- Some people are highly opposed to the Commonwealth’s program of buying water from willing sellers as a way of recovering water so more can be left to flow through the river system. However, there are others who support the water recovery program as they can use the water sale proceeds to restructure their businesses.

Question 21

Was it reported to the October 17th 2014 Basin Ministerial Council that the community had generally accepted the early stages of the Constraints Management Strategy? If so, what was the basis for such a report to the Ministerial Council?

Answer:

- No. Ministers were advised on 17 October 2014 that the community had strong concerns about relaxing constraints at the upper end of the flow ranges under consideration.

Question 22

Did Ministers at this meeting of October 17th 2014, after being advised there was community acceptance of the CMS, decide to proceed with further work on the Constraints Management Strategy?

Answer:

- Ministers were advised that the community had strong concerns about relaxing constraints at the upper end of the flow ranges under consideration. Ministers agreed that more detailed investigations into addressing constraints should proceed in 2015, to assess further the potential benefits, impacts and costs of relaxing constraints.

Question 23

The committee has received submissions detailing how the community rejected proposals for daily flows along the Murray of between 40,000 and 77,000 ML, which have then appeared in the CMS Annual Progress Report as being ‘feasible’ and ‘community acceptance for further investigations.’ Were these rejected flow proposals, which were contained in the CMS, the essence of the further work on the strategy the Ministers agreed to on October 17th?

Answer:

- Ministers were advised on 17 October 2014 that the community had strong concerns about relaxing constraints at the upper end of the flow ranges under consideration. In December 2014 New South Wales officials, in consultation with other state officials, revised the upper flow limit for investigations to 65,000ML/day downstream of Yarrawonga in response to the strong community concerns.
- In addition, the text cited in question 23, drawn from the Constraints Management Strategy Annual Progress Report 2013-14 has been used out of context. The text is taken directly from a table that describes flows deemed feasible for further investigation at the time, not flows deemed feasible for implementation. After publication of the report, and consideration of the information contained in it and supporting documents, it was considered feasible by New South Wales officials to further investigate flows of 50,000 and 65,000 ML/day in the Yarrawonga to Wakool Region of the River Murray. This was the basis for continuing to talk to communities about what the flows might mean for them and what additional information might need to be sourced to see if it was possible to address any possible impacts or other concerns raised.

Question 24

Does the MDBA support such flow rates? Do landholders adjoining the river support these flow rates?

Answer:

- The MDBA's role has always been to investigate how constraints could be addressed and to advise Basin governments on the associated impacts and costs of doing so. Accordingly, the MDBA does not seek to advocate any particular flow rate.
- State governments are responsible for consulting with landholders in the feasibility stage of the Constraints Management Strategy with the MDBA providing consultation support where requested. Landholders have expressed a range of views from strong concern to strong support, however, evidence suggests that continuing to work with the community to address concerns and explain the complex scientific information is viewed positively in at least some of the constraints regions.
- The MDBA supports the Constraints Management Strategy as it will allow the achievement of better environmental outcomes without further impacting on agricultural production provided that the support of affected third parties is obtained and any impacts are adequately compensated for. This is a fundamental principle of the Strategy.

Question 25

The report Economic Impact Assessment of the Murray Darling Basin Plan on Wakool Shire 2014 outlines devastating consequences for the shire and its residents from the implementation of the Basin Plan. Do you accept the report's findings?

Answer:

- The MDBA does not accept the report's findings. The changes described in the report occurred prior to 2011 and the commencement of the Basin Plan. The adverse impacts predicted are a consequence of multiple other influences on social and economic conditions in the Wakool area. The report relies on statistics from the Australian Bureau of Statistics which shows changes in employment from 2001 to 2011, but in 2011 water recovered for the Basin Plan from the New South Wales Murray area (which includes the Wakool area) was around 3% of entitlements on issue.
- The MDBA accepts that implementation of the Basin Plan will have a mixture of positive and negative impacts on regional and local economies. The extent of these impacts will depend upon both the broader economic and social conditions prevailing in each region in the lead up to and during the implementation of the Basin Plan, as well as the extent of water recovery in each region arising from the Basin Plan.

Question 26

How do you reconcile the findings of this report on a single shire with MDBA's previous statements on the social and economic impacts of the Plan?

Answer:

- The findings in the 2014 report largely relate to changes that occurred before Basin Plan water recovery.
- The MDBA is required to report on the economic and social impacts of the Basin Plan in 2017.

Question 27

Why did the MDBA partner with the Murray Darling Association only in the last 12 months, more than 2 years after implementation of the Plan commenced, to discover the integrity and extent of council data collection of social and economic impacts of the Basin Plan?

Answer:

- The MDBA partnered with the Murray Darling Association in December 2013, a little over 2 years ago.
- An MOU was signed in December 2013 between the Association and the MDBA to exchange information about water management matters in the basin and draw on local government knowledge from across the Basin.
- The MDBA seeks to find efficient mechanisms to connect with local government across the Basin and the MDBA believed that the Association was well placed to help the MDBA determine the data local governments were already collecting. It was hoped that this might provide another source of information to feed into the MDBA's existing program of social and economic work.

Question 28

It is accepted that there have been positive and negative impacts from the implementation of the Plan. Why have the MDBA not reported publicly on some of the negative impacts of the implementation of the Plan?

Answer:

- The MDBA recognises that there are signs of both positive and negative social and economic circumstances in Basin communities. It is not yet possible to provide definitive evidence of the extent to which the Basin Plan water reforms are having either a negative or positive effect on Basin industries and communities.
- The MDBA has commenced publishing details of changes occurring in Basin communities and industries on its website⁷, and will continue to update this work as more information becomes available. The MDBA reports annually on how the Basin Plan is tracking against its social, economic and environmental objectives, and is obliged to report on the social and economic effects of the Basin Plan, both positive and negative, in 2017.

Question 29

Are the current or previous CMS investigations looking at relaxing constraints to deliver the 2750 GL of recovered water?

Answer:

- No. It is not necessary to relax constraints to deliver 2750GL of recovered water. The Basin Plan was designed to operate within the current river operating constraints in 2012.
- However, relaxing or removing key constraints would allow for more flexibility in water delivery, which means that even more environmental benefit could be achieved with the water available.

⁷ <http://www.mdba.gov.au/socio-economic-profile-murray-darling-basin>

Question 30

Numbers of birds and other fauna and their condition are discussed at length in MDBA literature. What is the estimated impact on birds and other fauna from the drying of man-made wetlands due to reductions in available irrigation water?

Answer:

- The impact of drying of ‘man-made’ wetlands on birds and other fauna has not been quantified. However, the 30 years of the annual Aerial Waterbird Survey of Eastern Australia (started by CSIRO and New South Wales National Parks and Wildlife service, now led by the University of New South Wales) concluded that despite the natural boom and bust cycles of water birds, river regulation in the Murray-Darling Basin has coincided with a long term reduction in bird abundance and diversity, compared to the largely unregulated Lake Eyre Basin.
- The development of ‘man-made’ wetlands has provided birds and other fauna with alternative refuge opportunities, including during times of severe drought. Birds move around to where water is available, whether natural or man-made, and they can cover large distances to find suitable wetland habitat, including outside of their usual breeding grounds.
- Natural wetlands often provide more habitat diversity, than ‘man-made’ wetlands. However, river regulation has resulted in many ‘natural’ wetlands being cut off from the floodplain and no longer flooded, reducing the number of ‘natural’ wetlands and available habitat.
- The decline in bird numbers outlined above has occurred even with a number of man-made wetlands becoming established in the basin.

Question 31

Please advise what management actions specific to the Coorong, Lower Lakes and Murray Mouth have been undertaken by the MDBA since the end of the Millennium drought.

Answer:

- The joint Basin governments, through the MDBA, funded in part the removal of emergency works at Narrung, Clayton and Currency Creek.
- Similarly, the joint governments have funded dredging of the Murray Mouth since January 2015.
- Otherwise management actions relating to Coorong, Lower Lakes and Murray Mouth are undertaken by South Australia (see Question 32).

Question 32

Please advise what management actions specific to the Coorong, Lower Lakes and Murray Mouth have been undertaken by the MDBA Basin partner, the S.A. government, since the end of the Millennium drought.

Answer:

- The South Australian government has:
 - removed emergency works at Narrung, Clayton and Currency Creek
 - implemented Lake Level cycling to improve salinity in Lake Albert, subject to water availability

- maintained continuous releases through barrages for five years, sustained by combination of unregulated flows and environmental water
- constructed new fishway at Boundary Creek
- dredged Murray Mouth since January 2015

Question 33

Why are salinity levels in Lake Albert still very high after the massive floods of 2011?

Answer:

- Massive floods such as occurred in 2011 do not necessarily result in rapid reduction in salinity in Lake Albert.
- Lake Albert is a terminal lake. Dilution of salinity in Lake Albert occurs due primarily to wind driven water flows between Lakes Albert and Alexandrina. Salinity is also impacted by rain on the lakes and other changes in relative lake levels.
- By late 2015 the salinity in Lake Albert had fallen to less than 2,000 EC which is similar to levels observed in the lead up to the drought of 2006-2010.

Question 34

Salinity levels are of concern to many people and a key driver in reducing water extractions to increase river flows. Salinity levels in Lake Albert and the Coorong are used by people to argue for more action on the Basin Plan. Assuming Lake Albert and the Coorong are not under the direct control of the MDBA, who is responsible for taking action to reduce salinity levels in Lake Albert and the Coorong?

Answer:

- The Lower Lakes are managed by the South Australian Government.
- Salinity levels in Lake Albert and the Coorong are mainly dependent on flows to South Australia and local weather.
- The cycling of water through Lake Alexandrina is one measure that can contribute to reducing salinity in Lake Albert but it is not the main driver.

Question 35

The Sustainable Rivers Audit process was seen by many as a useful evaluation tool, but this process has been terminated. Why is that?

Answer:

- The Sustainable Rivers Audit (SRA) was a monitoring program that was jointly funded by basin governments. Basin state and territory governments decided to cease funding the SRA program as it did not align with the monitoring of ecological health required under the Basin Plan.
 - The SRA monitored ecological health compared to a pre-European benchmark. It was also not linked to specific water management actions like the Basin Plan.
- Since the end of the SRA, the MDBA has established a monitoring program to gather information about the environmental impact of the Basin Plan at the Basin scale.

- The Basin scale monitoring is supplemented by other monitoring being done by the states and the Commonwealth Environmental Water Holder at the asset or site scale.

Question 36

Monitoring and evaluation of environmental objectives does not appear to be commensurate with the \$13 billion investment the Commonwealth has committed in the Plan. Announced programs are going to expend approximately \$35 million over 5 years. Is the level of funding for monitoring and evaluation adequate to justify an investment of this scale?

Answer:

- The MDBA has published an evaluation framework which outlines how the MDBA will evaluate the effectiveness of the Basin Plan and whether the intended environmental, social and economic objectives and outcomes are being achieved. The framework includes the scope of the future evaluation work, the questions that will be addressed, the evaluation methods, indicators that will be used to measure progress, the types of data that will be drawn upon and the roles and reporting by the people involved. The framework is available on the MDBA website at www.mdba.gov.au/media-pubs/publications/basin-plan-evaluation-framework.
- The MDBA has put a Basin scale monitoring program in place to meet the information requirements of this framework. The Basin scale monitoring information will be supplemented by monitoring by the Commonwealth Environmental Water Holder and Basin states at the asset and site scale.
- The MDBA would support additional monitoring activity that demonstrates the environmental benefit of the Basin Plan and informs future reviews where the activities are efficient and effective. We are also keen to support a ‘citizen science’ initiative, subject to funding.
- The scope of this work does not address all areas of the Federal government’s water reform investment. Areas such as irrigation efficiency for example would be a matter for the Department of Agriculture and Water Resources.

Question 37

Achieving environmental objectives is the key driver of the Plan. What specific benchmarks have been established against the four key indicators the MDBA use to measure the success of environmental objectives?

Answer:

- The Basin Plan driver is the triple bottom line - optimisation of social, economic and environmental outcomes.
- With respect to environmental outcomes the Basin Plan is supported by other components such as the Basin-wide Environmental Watering Strategy (2014). The four key indicators used are hydrology (river flows and connectivity), native vegetation, native fish and waterbirds. A summary of the Baselines and timeframes are outlined below.

Key indicator	Baseline	Timeframe for success
River flows and connectivity	Modelled flows using data from 1895-2009 across all MDB catchments	Achievement of the outcomes for river flows and connectivity are expected by 2024

Vegetation	The extent of vegetation in 2013 that is or may be able to be inundated on the managed floodplain	Achievement of the outcomes for vegetation are expected by 2024
Waterbirds	<p>Historic correlations between surveyed waterbird populations and flow in the MDB at June 2009</p> <p>South Eastern Australian Waterbird Survey data 1983-2012</p> <p>The baseline for migratory waterbirds in the Coorong is between 2000 and 2014</p>	<p>Achievement of the outcomes for waterbirds are expected from 2024 on-wards</p> <p>Achievement of the outcomes for migratory shorebirds waterbirds (i.e. maintain populations) are expected to occur by 2019</p>
Native fish	<p>Modelled flows using data from 1895-2009 across all MDB catchments</p> <p>SRA data from 2004-2010</p> <p>The distribution and abundance baseline for short lived fish is pre 2007</p>	Achievement of the outcomes for native fish are expected by 2024

Question 38

Do you think it would be advantageous to amend carryover rules? If so, what improvements could be made?

Answer:

- Basin States are responsible for determining carryover arrangements within their jurisdiction.
- The Basin Plan generally does not require changes to carryover arrangements in the States, except where necessary to comply with the Basin Plan water trading rules.
- Existing carryover arrangements give water users flexibility to manage variable water availability across seasons. Ensuring the continuity of these arrangements and maintaining the efficient and equitable operation of water markets are important for providing certainty for all water users across the Basin.

Question 39

When will the MDBA start to recover the additional 450 GL of water?

Answer:

- The MDBA does not administer this program – it is the responsibility of the Department of Agriculture and Water Resources.

Question 40

Does the MDBA consider there has been equitable apportionment of water recovery between the states? How has that view been formed?

Answer:

- The apportionment of water recovery between states has been approached on the basis of shares that reflect the historic level of diversions by each jurisdiction. This is an equitable approach and endorsed by Basin states in their unanimous agreement to the Basin Plan.