Submission No 51

INQUIRY INTO RATIONALE FOR, AND IMPACTS OF, NEW DAMS AND OTHER WATER INFRASTRUCTURE IN NSW

Name: Mr Dugald Bucknell

Date Received: 24 September 2020

LEGISLATIVE COUNCIL
PORTFOLIO COMMITTEE NO.7
PLANNING AND ENVIRONMENT

INQUIRY INTO THE RATIONALE FOR
AND IMPACTS OF NEW DAMS AND OTHER WATER INFRASTRUCTURE IN NSW

Dear Sir /Madam,
Thankyou for the opportunity to comment on the Inquiry into the rationale for and impacts of new dams and other water infrastructure in NSW, My knowledge is the Macquarie floodplain, so I will concentrate on the Macquarie River Re/regulating Storage,
I live at Quambone, NSW, owning and managing 9 properties in and beside the Macquarie Marshes floodplain. My family has been involved in the local area for over 100 years and in the whole Macquarie valley since the Blue Mountains were crossed by Blaxland Lawson and Wentworth.
We have successfully operated a longterm multigenerational agricultural business' in a sustainable environment.
So with this in front of mind, I am making this submission because I fear that the future sustainability of our environment and thus our community is under threat because of current water management carried out by Water NSW, NSW Dep't of Planning, industry and Environment, and Infrastructure NSW. I consider their management to be NOT in the state or national interest, but rather in the interest of there 'paying customers'.

As the Inquiry is into many rivers with broad terms of reference please do not limit my comments to just the Macquarie as they may be equally appropriate in multiple rivers.

The following extracts from the EPBC act referral are from Water NSW and Infrastructure NSW and defines their reasons and expectations for the Macquarie River Re- Regulating storage.

The Macquarie River valley experiences relatively low water reliability and security compared to other water systems in NSW. The purpose of the project is to increase the security of the supply of water, to realise the full potential of water intensive agricultural operations and improve town water security in the region.
The project's objectives are to:
•Achieve long-term water security strategic objectives in the Macquarie River catchment
•Improve delivery efficiency to water customers downstream of Gin Gin Weir
•Reduce transmission losses when transferring and delivering water through the river system on an annual basis
•Maximise available water for general security water customers within the sustainable diversion limits set under theMurray-Darling Basin Plan.
The project involves constructing, operating and maintaining a re-regulating storage on the Macquarie River downstream of Narromine. The project would temporarily store part of operational surplus flow events and regulate them as required, and thus reduce operational losses. The project will also provide

operational flexibility to more efficiently deliver water to water users. No such storage is currently available on the Macquarie River downstream of the major upper catchment dams.The preferred option for the project is a new 6,000 megalitre (ML) re-regulating storage around 200m downstream of the existing Gin Gin Weir, approximately 6km upstream of Gin Gin and 18km northeast of Trangie. Gin Gin Weir is owned and operated by WaterNSW and its pool facilitates water extraction for numerous irrigation farms. Gin Gin Weir will be partially demolished to provide fish passage at low storage levels

The State Infrastructure Strategy 2018-2038 (Infrastructure NSW 2018) identified the Macquarie River catchment as one of the three highest priority inland river catchments facing the most significant water management challenges in NSW. The catchment has low drought security due to low/variable rainfall, high evaporation and limited storages. The Strategy illustrates how the combination of climate, topography and existing asset performance indicates the potential need for augmentation of, or investment in, additional storage capacity to improve water security. In addition for the Macquarie River catchment, delivery efficiency is also a priority due to distribution losses and operational inefficiencies. ***Also, climate modelling suggests that, in the absence of a material response, reliability is forecast to continue to decrease in the face of a changing climate.*** *Water availability is critical for the urban centres with growing populations as well as for the high security licence holders, environment and cultural values of the region.*
Further detailed analysis by WaterNSW supported this assessment, with low reliability of water supply causing a substantial proportion of the irrigated agricultural production capacity to be under utilised, with negative economic and social impacts for communities. A number of feasible options were identified for further assessment, of which a new re-regulating storage on theMacquarie River, was one.A mid-river re-regulating storage was considered a prospective solution to assist with mitigating operational inefficiencies in the regulated system. A new re-regulating storage, in the vicinity of the existing Gin Gin Weir, was considered worthy of further assessment because it would improve operational flexibility and reduce losses of allocated water released from distant headwater dams. Irrigation water orders could be delivered more timely and effectively, as could meeting minimum water flow targets along the system. - EPBC act referral section 8

This is clearly designed to mislead you, the Long Term Average Annual Yield of the Macquarie River should not of changed over the short time of post development, except as a result of Climate Change or the management by gov't departments. The problem is the over allocation of the water resource, which has been allocated multiple times the yield of the river. To do more of the same will increase the problems not solve them.

It should be noted that WaterNSW Strategic Plan 2018-2021 is about measuring 'outcomes' for customers and being a 'Customer Centric Organisation'. Priority 2 extract below. The whole document should be available from Water NSW.

Priority 2: Be a Customer Centric Organisation

Strategic Priority Objective: We will focus on activities that prioritise our customers in our decision making and actions so that we improve the value customers receive along with the quality of their experience. Ensure by 2021 more than 70% of our customers rank our service delivery as 7 or greater out of 10.

Theme	Key Outcomes	Key Actions	Draft Outcomes Measurement	Draft Delivery Timeframe
Knowing and Understanding our Customers	• WaterNSW customers say we understand their needs and are working to deliver to those needs • Employees understand the impact our services have on our customers	• Deliver a "Bring Customers to Life" program involving all employees • Regularly capture, distil and share customer insights with WaterNSW employees • Ongoing communication with our customers about their feedback	• Suitability of the services we provide as measured by our customers (10% increase by 2021)*	Q2 18/19 and Ongoing
Delivering Value for Money	• Increased awareness and recognition of WaterNSW and our services leading to a higher value for money score	• Deliver a "Bring WaterNSW to Life" with our Customers Program • Deliver service enhancements and new offerings for customers • Improve information services and communication across all external channels • Ensure all Business Cases are prioritised according to customer benefit	• Increase in our value for money index as measured by customers (15% increase by 2021)*	Progressively to Q4 20/21
Making it easier for our customers to deal with us	• Customers have a great service experience with WaterNSW	• Deliver service improvements for customers in line with key metrics (e.g. resolution times, online functionality)	• Increase in our customer service index as measured by customers (20% increase by 2021)*	Progressively to Q4 20/21
Working in Partnership with our customers	• Through our actions and activities and knowledge of our customers' needs, they see WaterNSW as their partner in advancing their interests in the water market	• Gain customer support for our 2021 Pricing Submission as the next step of a long term customer driven approach • Demonstrable community and customer engagement across all strategies and submissions	• The Quality of our relationship as measured by our customers (20% increase by 2021)*	Progressively to Q4 20/21
Everyone at WaterNSW is focussed on what our customers need	• All employees understand the important role they play in delivering for our customers, even when they have no direct contact with customers	• Implement internal customer delivery chain KPIs to measure responsiveness to external customer issues and demonstrate improvement over time • Implement program of relevant BU representative involvement in customer interactions • Ingrain our Customer Service Principles into all talent management (e.g. Position Descriptions,	• Changes based on external customer needs • Responsiveness to internal customer needs • Achieve a Customer Service Focus score of 3.94 by 2019* * Compared to 2016 Baseline	Q2 18/19 Ongoing Q4 18/19

4 Meeting the Act's priorities for water sharing is an ongoing challenge

This chapter introduces and provides a rationale for the Commission's key recommendation that the Plan needs to be amended and subsequently remade to meet the water sharing principles outlined in the Act.

In summary, the water sharing principles in the Act explicitly prioritise the protection of the environment and basic landholder rights over extractive use in the making of the Plan. The Act further emphasises that it is the duty of all persons exercising functions under the Act to act in accordance with them. The Act principles are clear - the needs of the river must come first. The Plan needs to be amended and then remade to achieve the priorities in the Act.

4.1 Priorities under the Act are clear

The Act makes it clear that water sharing is not about balancing uses and values, it is about firstly providing for the environment and secondly recognising basic landholder rights above other uses. The relevant water sharing principles are found in section 5(3) of the Act (**water sharing principles**), and are part of a broader set of water management principles.[161] The Act specifies that:

a) "sharing of water from a water source must protect the water source and its dependent ecosystems, and

b) sharing of water from a water source must protect basic landholder rights, and

c) **sharing or extraction of water under any other right must not prejudice the principles set out in paragraphs (a) and (b).**"[162]

Further, section 9(1) of the Act provides that "It is the duty of all persons exercising functions under this Act:

a) to take all reasonable steps to do so in accordance with, and so as to promote, the water management principles of this Act, and

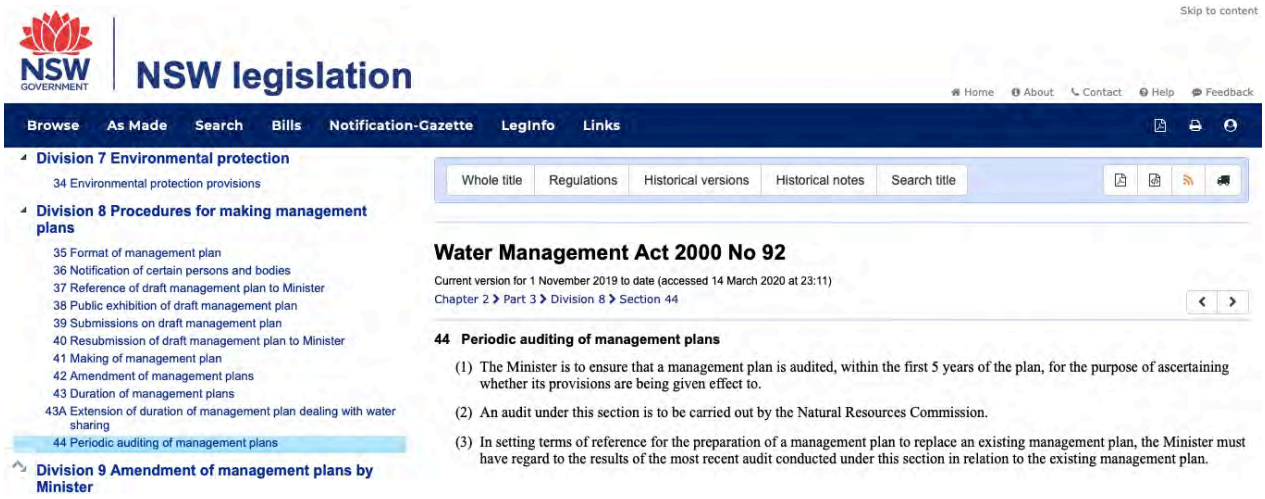
b) as between the principles for water sharing set out in section 5(3), **to give priority to those principles in the order in which they are set out in that subsection.**"[163]

Persons exercising functions under the Act, as contemplated by section 9(1), would extend to the Ministers, in making a new water sharing plan,[164] amending a plan[165] or extending it.[166]

The project's objectives are in contravention of the NSW Water Management Act

Above an extract from the review of the water Sharing Plan for the Barwon Darling … Water Source 2012, published sept 2019 by the Natural Resources Commission. The Macquarie River is a Tributary to the Barwon River. One of the reports finding was the water sharing plan, thus the departments had contributed to the river being in hydrological drought 3 years in advance of what would of happened naturally.

The projects 2nd objective ‘Improve delivery efficiency to water customers downstream of Gin Gin weir is also misleading the major beneficiaries will be the irrigation schemes within the weir pool. They will have access to water at call from an additional height up to 10 metres, saving on pumping costs and a storage with no costs and no losses. Whilst receiving additional general security reliability. This is also changing the water shares which should trigger Section 44 of the NSW Water Management Act. Below.



There is no mention in the objectives of future plans for the weir that are within state planing and thus are not being accounted for in this Inquiry or the EPBC referral.
Some of the following have been acknowledged by staff.

1)The start of the pipeline for the Albert Priest Channel to deliver town water supply to Nyngan and Cobar.

2) The weir to be used as the End of System Weir in the next severe drought instead of Warren township, thus pipeline will be needed for Warren Town.

3) In times of drought a supply source for the city of Dubbo by capturing all the main tributaries below Burrendong dam, Bell, Little, Talbragar rivers and the Coolbaggie creek.

4)Pipelines to Narromine, Trangie, Nevertire, Gilgandra with extensions to mine sites at Tomingley, Cobar, and Girilambone.

5)The capture of tributary flows to maximise available water for general security water customers.

6)The maximisation of pumping efficiency for supplementary water access for water customers.

7)The maximisation of pumping efficiency for Flood Plain Harvesting for water customers now that flood plain harvesting has been legalised by regulation.

8)The increased soakage into groundwater to increase and maintain groundwater supplies to maximise potential of water intensive agricultural operations.

9)Using water from any source to meet “water flow targets along the system”
ie Base flows as stated in section 8.0 of the EPBC referral

Public consultations was originally in locations that would be beneficiaries or not unduly affected and seems to have been organised well before the remainder of the community, especially those who are going to loose the most. This group would include downstream communities, aboriginal, fishing, recreational, environmental, grazing and unregulated irrigators.
Basically the ducks were being lined up in advance.

The method and location of this most important statement shows the contempt that waterNSW holds for the environment.
In the EPBC referral at the end of Section 1.14 it states, below

WaterNSW will consult with relevant stakeholders in preparing the EIS. If the Minister decides that significant impacts toMNES are likely, these will be assessed under the EPBC Act. It is WaterNSW preference that the proposed action beassessed using an accredited process under section 87(4) of the EPBC Act, where the Commonwealth accredits theassessment process under Division 5.2 of Part 5 of the EP&A Act.

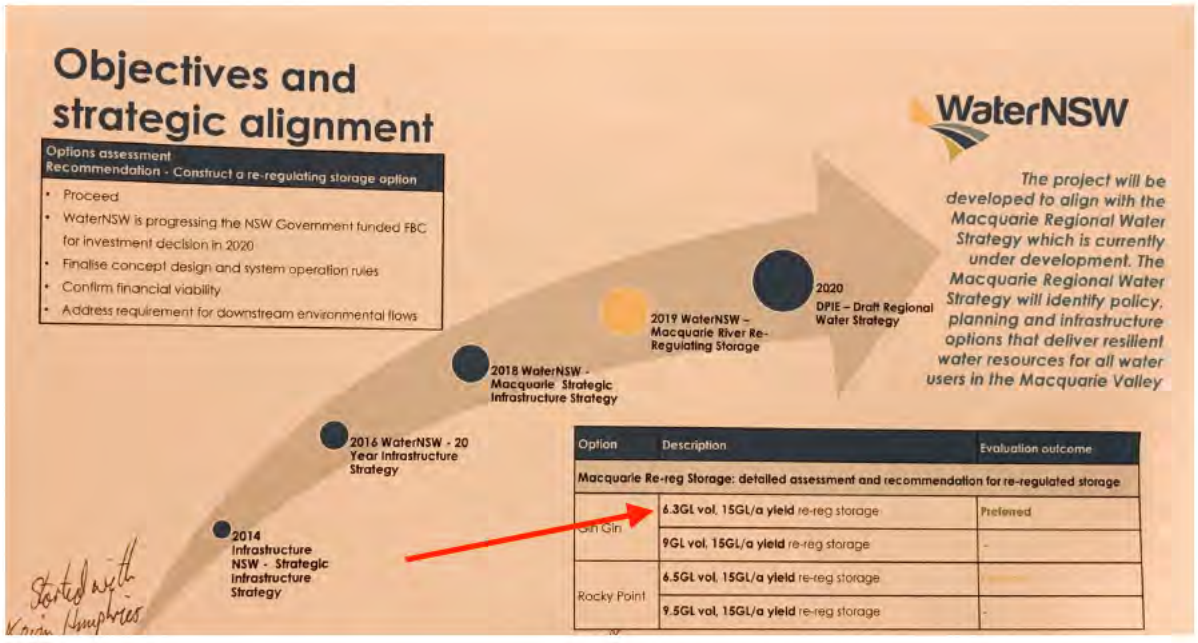
(MNES) - MATTERS of NATIONAL ENVIRONMENTAL SIGNIFICANCE (MNES)
These are the corner stones of both the state and commonwealth Water Acts and so many other laws relating to long term sustainability.
The NSW government wants to be the proposer designer builder operator regulator financier and marker of their own work!

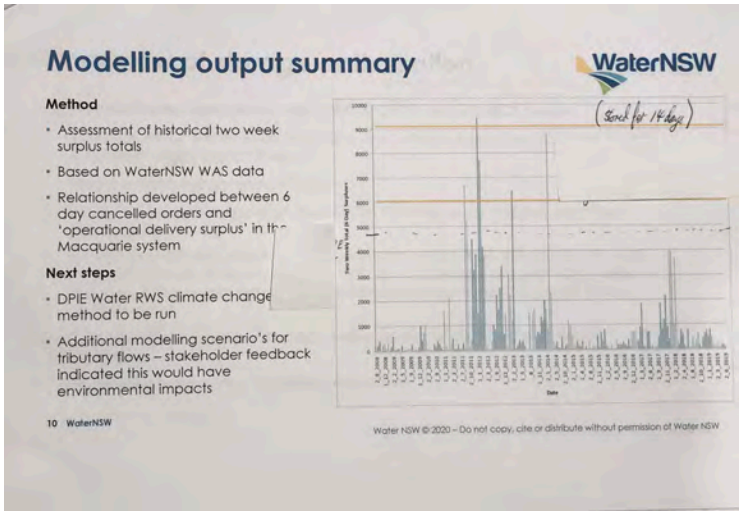
MATTERS of NATIONAL ENVIRONMENTAL SIGNIFICANCE (MNES)
In the EPBC act referral at section 2.3 it states

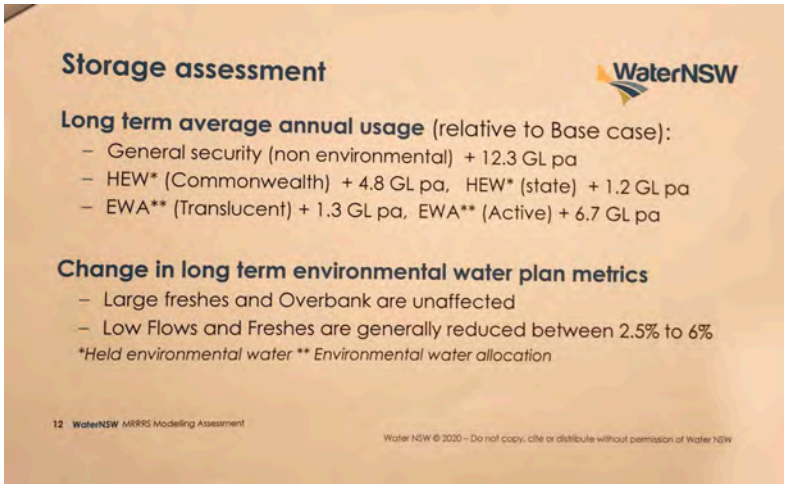
The Macquarie Marshes extend across the Lower Macquarie Floodplain north of Warren and are a significant downstream ecosystem. The wetlands are recognised in listings by NSW and the Commonwealth – listed as Critically Endangered under the Environmental Protection & Biodiversity Conservation Act 1999. The marshes are nationally and internationally important given their size, diversity of wetland types, extent of wetland communities and large-scale colonial waterbird breeding events.Within the wetlands are areas listed by Ramsar and are also subject to international agreements on migratory bird breeding sites.

This I absolutely agree with and note that they are critically endangered. This is solely due to the ongoing incremental increase in the removal of water, both natural PEW water and Held Environment water by management of state departments usually defined as efficiency measures to minimise **losses,** soakage and evaporation.

WaterNSW in their public consultations have been providing the following information.
A preferred 6.3 Gl storage with a 15 Gl annual yield. Gained from an assessment of historic two week surplus flows over the last 10 year modelled period.

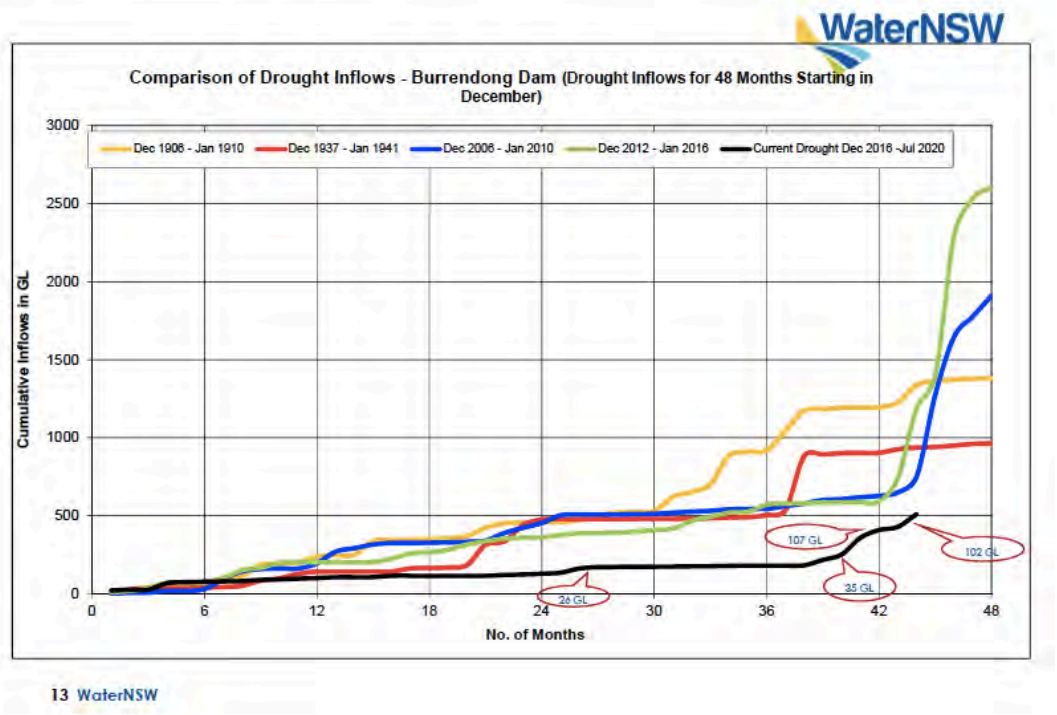






The actual long term average annual yield is 26.3 Gl **relative to the base case.**

I am very much in favour of running all models from 2008 onwards it would take into account climate change, department management, etc and it would update the MEAN, average, figures so that the basin plan, northern basin review, ESLT, SDL's could all be corrected.
BUT, for waterNSW to use an updated model when it suits is unbalanced.



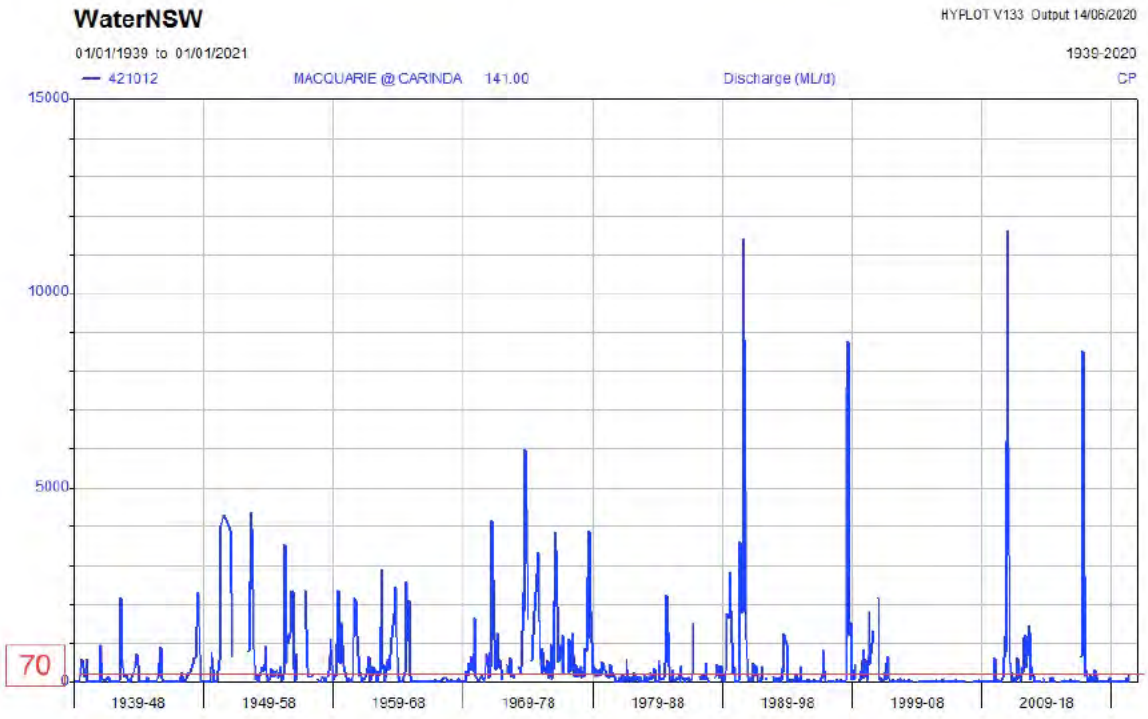
The ten year base case 2008-2019 coincides with 3 of the worst Droughts of Record (DoR) as can be seen here.

If the Macquarie river returns to 'normal' inflows the yield of the weir would be very different. The modelling assessment is based on two week surplus totals, so; theoretically storage optimisation could be 26 fortnights at 6.3 Gl or total of 163.8 Gl, unlikely yes, but means the figure of 26.3 Gl could easily be surpassed especially with WaterNSW Strategic Plan 2018-21 as their management strategy.

LONG-TERM AVERAGE ANNUAL USAGE/YEILD
See storage assessment above;
This is the quantity claimed to be added back or retained in Burrendong Dam for additional General security, under present management rain rejected water is reallocated when possible to other irrigators/town supply/S&D or Base flows so the 26.3 GL claimed as savings is water that has evaded reallocation, in other words has made it to the upper end of the marshes system. It is doing environmental good, keeping channels wet and ecosystem functions in that area so that when bigger flows arrive they have the ability to flow further into the Marshes system.
26.3Gl (could be much greater as discussed above) is a average daily flow of 26300Ml / 365 days = 72.05Ml per day

72 Ml is a very important figure, if you take 72 ml off the flow at the top of a water system each day it is never made up at any point to the End of System (EoS) flow, therefore any point in the Macquarie Marshes that receives 72ML per day or less will now have **ZERO** no flow or will go into negative moisture and thus be an inhibitor to future bigger flows.

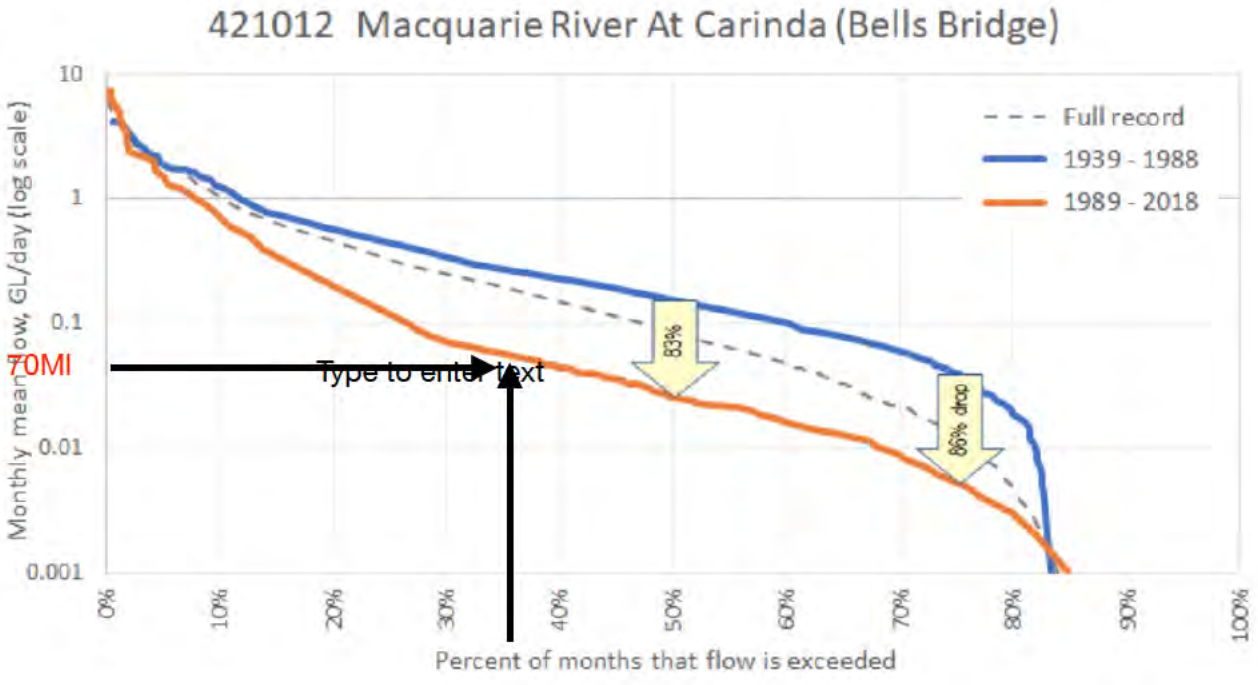
One of the determining factors for the health of the Marshes is the End of System Flow the river gauge near the end of the marshes is 421012 Macquarie River At Carinda (Bell's Bridge) as can be seen below.



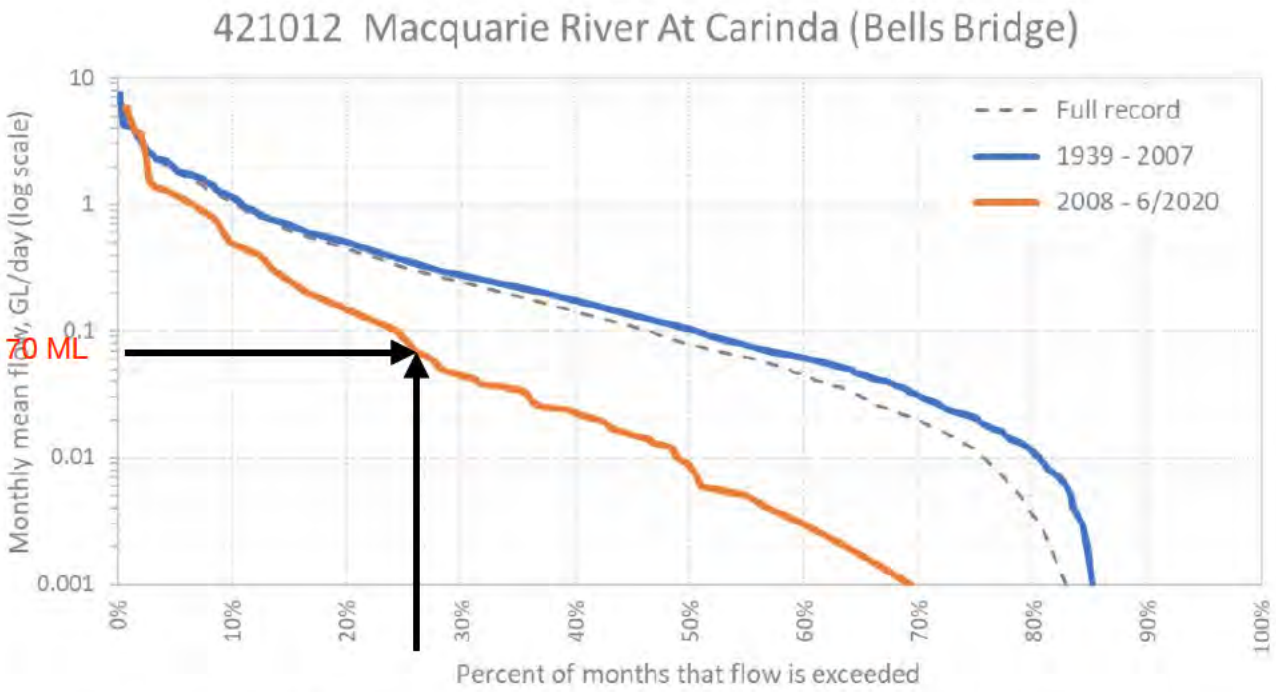
I have added a red line at approximately 70ML per day.

The Exceedance Graph for the Macquarie River at Carinda over the full recorded history shows the effect of river management by government and water extraction as can be seen below.

Please note the vertical axis is monthly mean flow, Gl/ day and is LOG scale ie 0.001 = 1ML/day



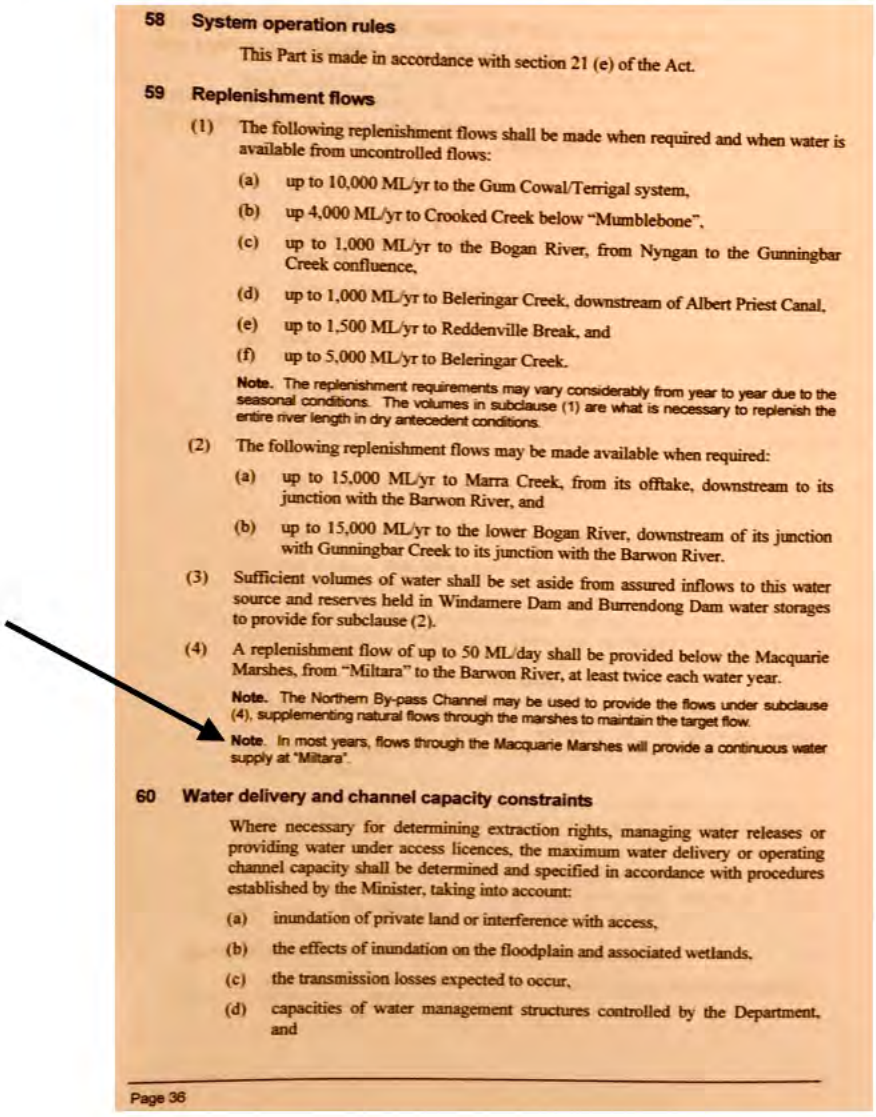
Although more than 80% of the flows have been taken the majority of the time. The taking of another 70 plus ML per day will take all the water at least 65% of the time.



Please Note: These are monthly figures so any flow on one day only, gives a monthly flow.
The first (top) Exceedance flow graph divides the historical years in half (39 years). Burrendong Dam was built in 1965 irrigation grew exponentially and expanded rapidly around 1980's.
The 2nd exceedance graph shows the effect of the last 12 years.

This is before any additional unannounced plans held in NSW government departments are enforced upon the river.
This information is not new to WaterNSW.
The 2004 Water Sharing Plan for the Macquarie page 36 had the 'note' below.
'Miltara' is a gauge just upstream from Carinda Bell's Bridge gauge.

This ‘note’ at the time quite clearly reflects the 1939-88 exceedance graph and the recorded flows at Carinda and the expectation that they will continue and EoS flows will contribute to the Barwon -Darling River. (if this expectation had been achieved the fish kills may not of happened in either the Darling or the Macquarie).



58 System operation rules

This Part is made in accordance with section 21 (e) of the Act.

59 Replenishment flows

(1) The following replenishment flows shall be made when required and when water is available from uncontrolled flows:

(a) up to 10,000 ML/yr to the Gum Cowal/Terrigal system,

(b) up 4,000 ML/yr to Crooked Creek below “Mumblebone”,

(c) up to 1,000 ML/yr to the Bogan River, from Nyngan to the Gunningbar Creek confluence,

(d) up to 1,000 ML/yr to Beleringar Creek, downstream of Albert Priest Canal,

(e) up to 1,500 ML/yr to Reddenville Break, and

(f) up to 5,000 ML/yr to Beleringar Creek.

Note. The replenishment requirements may vary considerably from year to year due to the seasonal conditions. The volumes in subclause (1) are what is necessary to replenish the entire river length in dry antecedent conditions.

(2) The following replenishment flows may be made available when required:

(a) up to 15,000 ML/yr to Marra Creek, from its offtake, downstream to its junction with the Barwon River, and

(b) up to 15,000 ML/yr to the lower Bogan River, downstream of its junction with Gunningbar Creek to its junction with the Barwon River.

(3) Sufficient volumes of water shall be set aside from assured inflows to this water source and reserves held in Windamere Dam and Burrendong Dam water storages to provide for subclause (2).

(4) A replenishment flow of up to 50 ML/day shall be provided below the Macquarie Marshes, from “Miltara” to the Barwon River, at least twice each water year.

Note. The Northern By-pass Channel may be used to provide the flows under subclause (4), supplementing natural flows through the marshes to maintain the target flow.

Note. In most years, flows through the Macquarie Marshes will provide a continuous water supply at “Miltara”.

60 Water delivery and channel capacity constraints

Where necessary for determining extraction rights, managing water releases or providing water under access licences, the maximum water delivery or operating channel capacity shall be determined and specified in accordance with procedures established by the Minister, taking into account:

(a) inundation of private land or interference with access,

(b) the effects of inundation on the floodplain and associated wetlands,

(c) the transmission losses expected to occur,

(d) capacities of water management structures controlled by the Department, and

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If the Macquarie river is going to have zero water in it at the end of the Macquarie Marshes at least 65% of the time it can no longer be called a marsh but rather an arid floodplain that has undergone a changed ecological state. It can not fit in any definition of sustainable or within the Commonwealth Water Act 2007 which requires an ESLT (environmentally sustainable level of take) leading to a SDL (sustainable diversion limit)
International agreements JAMBA CAMBA and Ramsar must also be broken.

I do consider the impact to be significant

The international agreements and the marshes, are recognised for their Colonial bird breeding.

The Ibis in the 1970's numbered about 500000 breeding pair (1000000 birds), in 2010/11 an estimated 50000 breeding pair and 2016 an estimated 30000 pair.

The life expectancy of an Ibis is on average 8 years. Thus all the birds are dead except the chicks from the 2016 breeding season and these chicks are now 4 years old, half way through their life.

To expect these birds to rebuild a sustainable population let alone a 1000000 birds is near impossible.

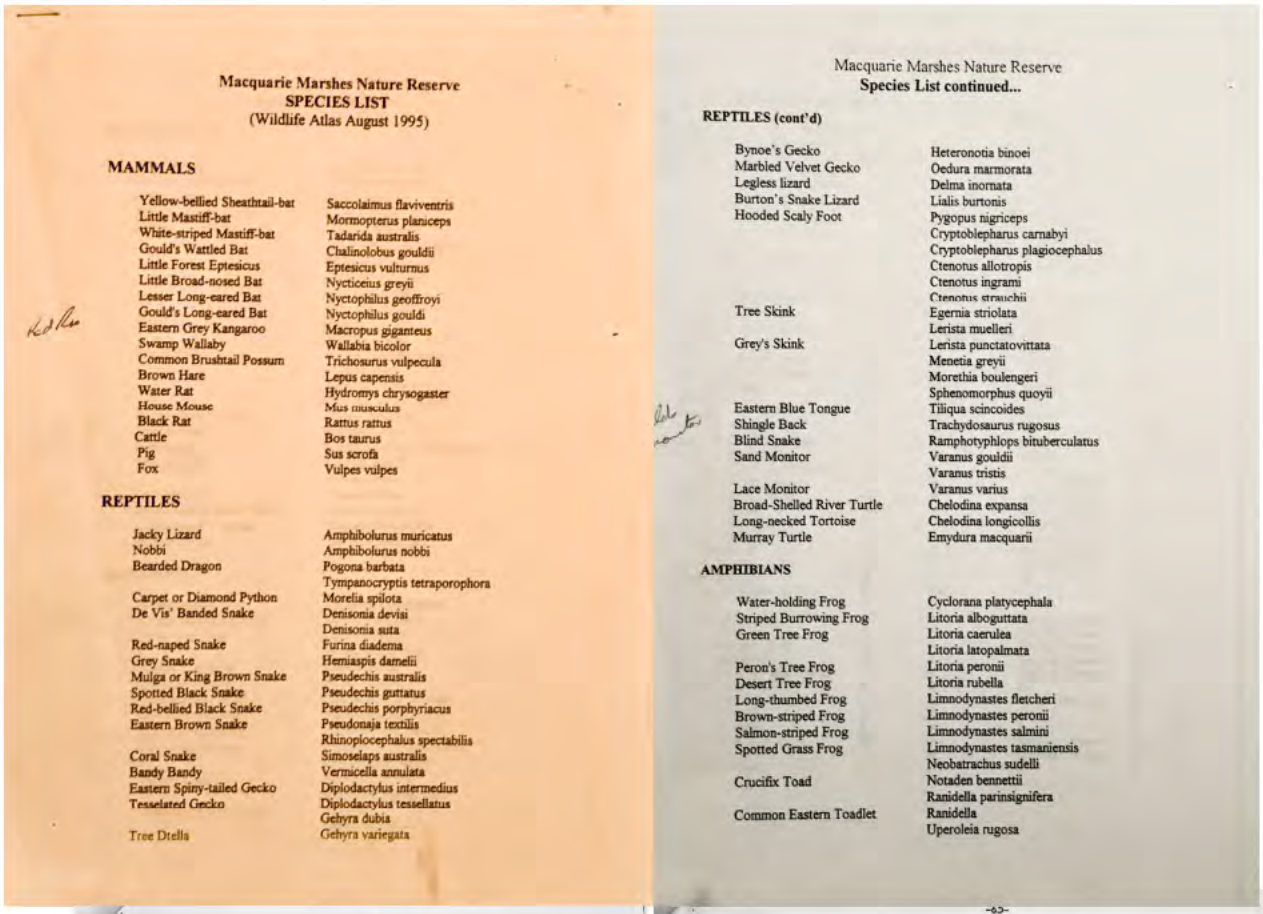
The birds have just been prevented from attempting to breed in this current first flush flood event by the taking of Flood Plain Harvesting and Supplementary water.

They attempted to nest on lignum at the back of my house which has never happened before.

The birds may or may not of been successful in raising chicks, but for the government departments and the irrigation industry to prevent any possibility of a breeding event, I consider criminal.

If one of the top apex fauna, Ibis,(which can relocate) are in such a dire situation, what is the stationary non relocatable ecosystem like? Is it saveable?

Species of the Macquarie Marshes whose habitat is increasingly under threat



Macquarie Marshes Nature Reserve
SPECIES LIST
(Wildlife Atlas August 1995)

MAMMALS

Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris
Little Mastiff-bat	Mormopterus planiceps
White-striped Mastiff-bat	Tadarida australis
Gould's Wattled Bat	Chalinolobus gouldii
Little Forest Eptesicus	Eptesicus vulturnus
Little Broad-nosed Bat	Nycticeius greyii
Lesser Long-eared Bat	Nyctophilus geoffroyi
Gould's Long-eared Bat	Nyctophilus gouldi
Eastern Grey Kangaroo	Macropus giganteus
Swamp Wallaby	Wallabia bicolor
Common Brushtail Possum	Trichosurus vulpecula
Brown Hare	Lepus capensis
Water Rat	Hydromys chrysogaster
House Mouse	Mus musculus
Black Rat	Rattus rattus
Cattle	Bos taurus
Pig	Sus scrofa
Fox	Vulpes vulpes

REPTILES

Jacky Lizard	Amphibolurus muricatus
Nobbi	Amphibolurus nobbi
Bearded Dragon	Pogona barbata
	Tympanocryptis tetraporophora
Carpet or Diamond Python	Morelia spilota
De Vis' Banded Snake	Denisonia devisi
	Denisonia suta
Red-naped Snake	Furina diadema
Grey Snake	Hemiaspis damelii
Mulga or King Brown Snake	Pseudechis australis
Spotted Black Snake	Pseudechis guttatus
Red-bellied Black Snake	Pseudechis porphyriacus
Eastern Brown Snake	Pseudonaja textilis
	Rhinoplocephalus spectabilis
Coral Snake	Simoselaps australis
Bandy Bandy	Vermicella annulata
Eastern Spiny-tailed Gecko	Diplodactylus intermedius
Tesselated Gecko	Diplodactylus tessellatus
	Gehyra dubia
Tree Dtella	Gehyra variegata

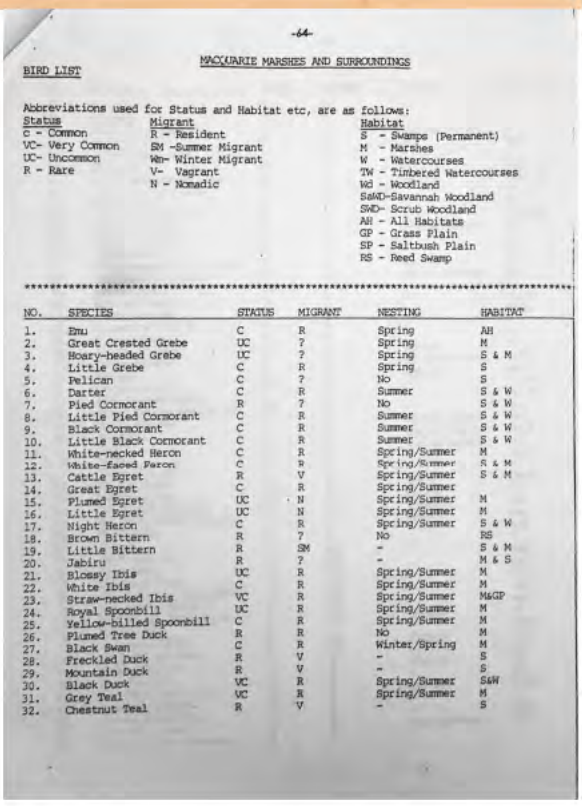
Macquarie Marshes Nature Reserve
Species List continued...

REPTILES (cont'd)

Bynoe's Gecko	Heteronotia binoei
Marbled Velvet Gecko	Oedura marmorata
Legless lizard	Delma inornata
Burton's Snake Lizard	Lialis burtonis
Hooded Scaly Foot	Pygopus nigriceps
	Cryptoblepharus carnabyi
	Cryptoblepharus plagiocephalus
	Ctenotus allotropis
	Ctenotus ingrami
	Ctenotus strauchii
Tree Skink	Egernia striolata
	Lerista muelleri
Grey's Skink	Lerista punctatovittata
	Menetia greyii
	Morethia boulengeri
	Sphenomorphus quoyii
Eastern Blue Tongue	Tiliqua scincoides
Shingle Back	Trachydosaurus rugosus
Blind Snake	Ramphotyphlops bituberculatus
Sand Monitor	Varanus gouldii
	Varanus tristis
Lace Monitor	Varanus varius
Broad-Shelled River Turtle	Chelodina expansa
Long-necked Tortoise	Chelodina longicollis
Murray Turtle	Emydura macquarii

AMPHIBIANS

Water-holding Frog	Cyclorana platycephala
Striped Burrowing Frog	Litoria alboguttata
Green Tree Frog	Litoria caerulea
	Litoria latopalmata
Peron's Tree Frog	Litoria peronii
Desert Tree Frog	Litoria rubella
Long-thumbed Frog	Limnodynastes fletcheri
Brown-striped Frog	Limnodynastes peronii
Salmon-striped Frog	Limnodynastes salmini
Spotted Grass Frog	Limnodynastes tasmaniensis
	Neobatrachus sudelli
Crucifix Toad	Notaden bennettii
	Ranidella parinsignifera
Common Eastern Toadlet	Ranidella
	Uperoleia rugosa



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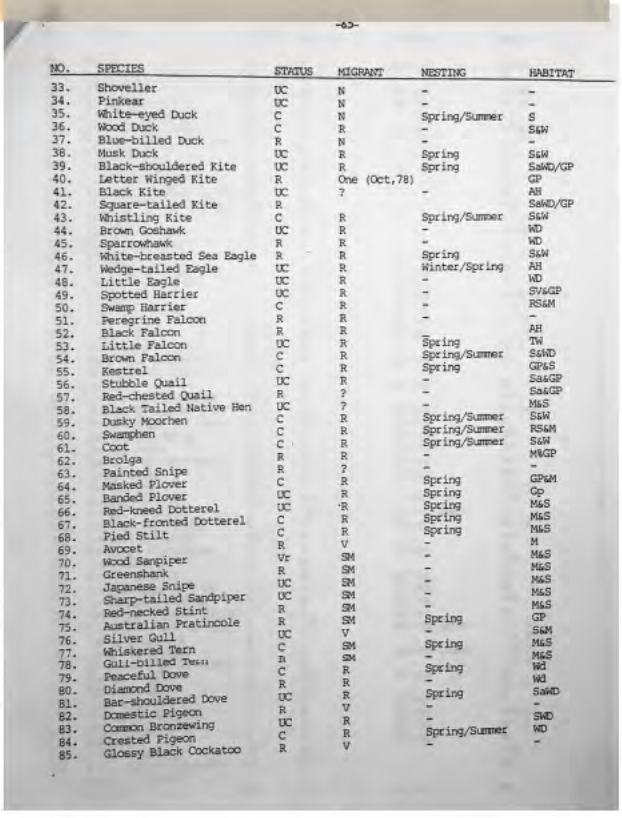
MACQUARIE MARSHES AND SURROUNDINGS

BIRD LIST

Abbreviations used for Status and Habitat etc, are as follows:

Status	Migrant	Habitat
C - Common	R - Resident	S - Swamps (Permanent)
VC- Very Common	SM -Summer Migrant	M - Marshes
UC- Uncommon	Wm- Winter Migrant	W - Watercourses
R - Rare	V- Vagrant	TW - Timbered Watercourses
	N - Nomadic	Wd - Woodland
		SaWD-Savannah Woodland
		SWD- Scrub Woodland
		AH - All Habitats
		GP - Grass Plain
		SP - Saltbush Plain
		RS - Reed Swamp

NO.	SPECIES	STATUS	MIGRANT	NESTING	HABITAT
1.	Emu	C	R	Spring	AH
2.	Great Crested Grebe	UC	?	Spring	M
3.	Hoary-headed Grebe	UC	?	Spring	S & M
4.	Little Grebe	C	R	Spring	S
5.	Pelican	C	?	No	S
6.	Darter	C	R	Summer	S & W
7.	Pied Cormorant	R	?	No	S & W
8.	Little Pied Cormorant	C	R	Summer	S & W
9.	Black Cormorant	C	R	Summer	S & W
10.	Little Black Cormorant	C	R	Summer	S & W
11.	White-necked Heron	C	R	Spring/Summer	M
12.	White-faced Heron	C	R	Spring/Summer	S & M
13.	Cattle Egret	R	V	Spring/Summer	S & M
14.	Great Egret	C	R	Spring/Summer	
15.	Plumed Egret	UC	N	Spring/Summer	M
16.	Little Egret	UC	N	Spring/Summer	M
17.	Night Heron	C	R	Spring/Summer	S & W
18.	Brown Bittern	R	?	No	RS
19.	Little Bittern	R	SM	-	S & M
20.	Jabiru	R	?	-	M & S
21.	Blossy Ibis	UC	R	Spring/Summer	M
22.	White Ibis	C	R	Spring/Summer	M
23.	Straw-necked Ibis	VC	R	Spring/Summer	M&GP
24.	Royal Spoonbill	UC	R	Spring/Summer	M
25.	Yellow-billed Spoonbill	C	R	Spring/Summer	M
26.	Plumed Tree Duck	R	R	No	M
27.	Black Swan	C	R	Winter/Spring	M
28.	Freckled Duck	R	V	-	S
29.	Mountain Duck	R	V	-	S
30.	Black Duck	VC	R	Spring/Summer	S&W
31.	Grey Teal	VC	R	Spring/Summer	M
32.	Chestnut Teal	R	V	-	S



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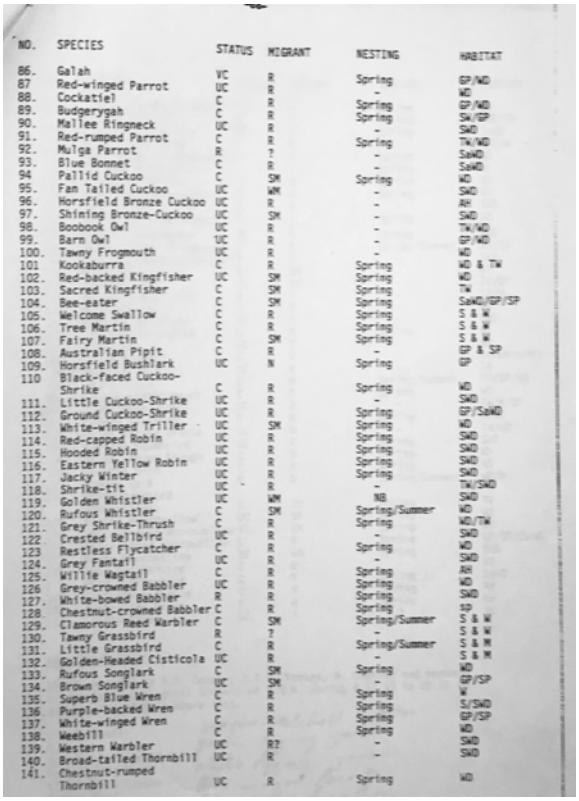
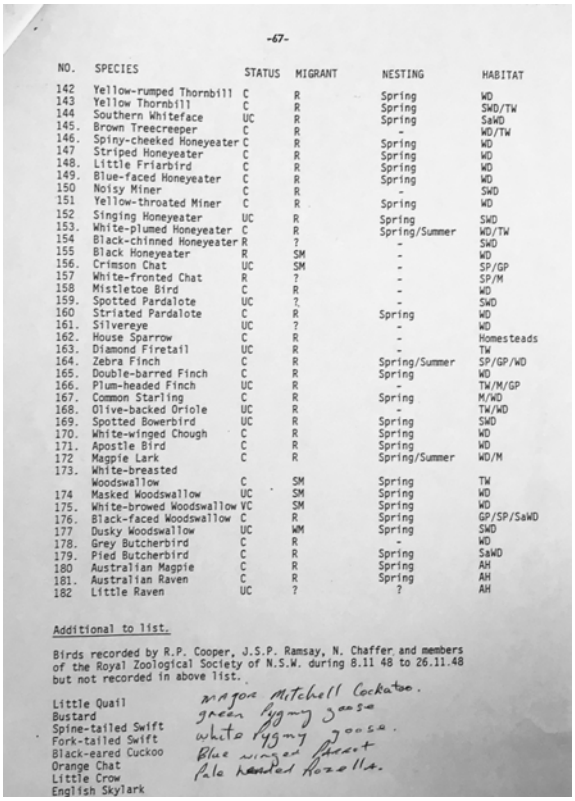
NO.	SPECIES	STATUS	MIGRANT	NESTING	HABITAT
33.	Shoveller	UC	N	-	-
34.	Pinkear	UC	N	-	-
35.	White-eyed Duck	C	N	Spring/Summer	S
36.	Wood Duck	C	R	-	S&W
37.	Blue-billed Duck	R	N	-	-
38.	Musk Duck	UC	R	Spring	S&W
39.	Black-shouldered Kite	UC	R	Spring	SaWD/GP
40.	Letter Winged Kite	R	One (Oct,78)		GP
41.	Black Kite	UC	?	-	AH
42.	Square-tailed Kite	R			SaWD/GP
43.	Whistling Kite	C	R	Spring/Summer	S&W
44.	Brown Goshawk	UC	R	-	WD
45.	Sparrowhawk	R	R	-	WD
46.	White-breasted Sea Eagle	R	R	Spring	S&W
47.	Wedge-tailed Eagle	UC	R	Winter/Spring	AH
48.	Little Eagle	UC	R	-	WD
49.	Spotted Harrier	UC	R	-	SV&GP
50.	Swamp Harrier	C	R	-	RS&M
51.	Peregrine Falcon	R	R	-	-
52.	Black Falcon	R	R	-	AH
53.	Little Falcon	UC	R	Spring	TW
54.	Brown Falcon	C	R	Spring/Summer	S&WD
55.	Kestrel	C	R	Spring	GP&S
56.	Stubble Quail	UC	R	-	Sa&GP
57.	Red-chested Quail	R	?	-	Sa&GP
58.	Black Tailed Native Hen	UC	?	-	M&S
59.	Dusky Moorhen	C	R	Spring/Summer	S&W
60.	Swamphen	C	R	Spring/Summer	RS&M
61.	Coot	C	R	Spring/Summer	S&W
62.	Brolga	R	R	-	M&GP
63.	Painted Snipe	R	?	-	-
64.	Masked Plover	C	R	Spring	GP&M
65.	Banded Plover	UC	R	Spring	Gp
66.	Red-kneed Dotterel	UC	R	Spring	M&S
67.	Black-fronted Dotterel	C	R	Spring	M&S
68.	Pied Stilt	C	R	Spring	M&S
69.	Avocet	R	V	-	M
70.	Wood Sanpiper	Vr	SM	-	M&S
71.	Greenshank	R	SM	-	M&S
72.	Japanese Snipe	UC	SM	-	M&S
73.	Sharp-tailed Sandpiper	UC	SM	-	M&S
74.	Red-necked Stint	R	SM	-	M&S
75.	Australian Pratincole	R	SM	Spring	GP
76.	Silver Gull	UC	V	-	S&M
77.	Whiskered Tern	C	SM	Spring	M&S
78.	Gull-billed Tern	R	SM	-	M&S
79.	Peaceful Dove	C	R	Spring	Wd
80.	Diamond Dove	R	R	-	Wd
81.	Bar-shouldered Dove	UC	R	Spring	SaWD
82.	Domestic Pigeon	R	V	-	-
83.	Common Bronzewing	UC	R	-	SWD
84.	Crested Pigeon	C	R	Spring/Summer	WD
85.	Glossy Black Cockatoo	R	V	-	-



NO.	SPECIES	STATUS	MIGRANT	NESTING	HABITAT
86.	Galah	VC	R	Spring	GP/WD
87	Red-winged Parrot	UC	R	-	WD
88.	Cockatiel	C	R	Spring	GP/WD
89.	Budgerygah	C	R	Spring	SW/GP
90.	Mallee Ringneck	UC	R	-	SWD
91.	Red-rumped Parrot	C	R	Spring	TW/WD
92.	Mulga Parrot	R	?	-	SaWD
93.	Blue Bonnet	C	R	-	SaWD
94	Pallid Cuckoo	C	SM	Spring	WD
95.	Fan Tailed Cuckoo	UC	WM	-	SWD
96.	Horsfield Bronze Cuckoo	UC	R	-	AH
97.	Shining Bronze-Cuckoo	UC	SM	-	SWD
98.	Boobook Owl	UC	R	-	TW/WD
99.	Barn Owl	UC	R	-	GP/WD
100.	Tawny Frogmouth	UC	R	-	WD
101	Kookaburra	C	R	Spring	WD & TW
102.	Red-backed Kingfisher	UC	SM	Spring	WD
103.	Sacred Kingfisher	C	SM	Spring	TW
104.	Bee-eater	C	SM	Spring	SaWD/GP/SP
105.	Welcome Swallow	C	R	Spring	S & W
106.	Tree Martin	C	R	Spring	S & W
107.	Fairy Martin	C	SM	Spring	S & W
108.	Australian Pipit	C	R	-	GP & SP
109.	Horsfield Bushlark	UC	N	Spring	GP
110	Black-faced Cuckoo-Shrike	C	R	Spring	WD
111.	Little Cuckoo-Shrike	UC	R	-	SWD
112.	Ground Cuckoo-Shrike	UC	R	Spring	GP/SaWD
113.	White-winged Triller	UC	SM	Spring	WD
114.	Red-capped Robin	UC	R	Spring	SWD
115.	Hooded Robin	UC	R	Spring	SWD
116.	Eastern Yellow Robin	UC	R	Spring	SWD
117.	Jacky Winter	UC	R	Spring	SWD
118.	Shrike-tit	UC	R	-	TW/SWD
119.	Golden Whistler	UC	WM	NB	SWD
120.	Rufous Whistler	C	SM	Spring/Summer	WD
121.	Grey Shrike-Thrush	C	R	Spring	WD/TW
122	Crested Bellbird	UC	R	-	SWD
123	Restless Flycatcher	C	R	Spring	WD
124.	Grey Fantail	UC	R	-	SWD
125.	Willie Wagtail	C	R	Spring	AH
126	Grey-crowned Babbler	UC	R	Spring	WD
127.	White-bowed Babbler	R	R	Spring	SWD
128.	Chestnut-crowned Babbler	C	R	Spring	SP
129.	Clamorous Reed Warbler	C	SM	Spring/Summer	S & W
130.	Tawny Grassbird	R	?	-	S & W
131.	Little Grassbird	C	R	Spring/Summer	S & W
132.	Golden-Headed Cisticola	UC	R	-	S & W
133.	Rufous Songlark	C	SM	Spring	WD
134.	Brown Songlark	UC	SM	-	GP/SP
135.	Superb Blue Wren	C	R	Spring	W
136.	Purple-backed Wren	C	R	Spring	S/SWD
137.	White-winged Wren	C	R	Spring	GP/SP
138.	Weebill	C	R	Spring	WD
139.	Western Warbler	UC	R?	-	SWD
140.	Broad-tailed Thornbill	UC	R	-	SWD
141.	Chestnut-rumped Thornbill	UC	R	Spring	WD



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NO.	SPECIES	STATUS	MIGRANT	NESTING	HABITAT
142	Yellow-rumped Thornbill	C	R	Spring	WD
143	Yellow Thornbill	C	R	Spring	SWD/TW
144	Southern Whiteface	UC	R	Spring	SaWD
145.	Brown Treecreeper	C	R	-	WD/TW
146.	Spiny-cheeked Honeyeater	C	R	Spring	WD
147	Striped Honeyeater	C	R	Spring	WD
148.	Little Friarbird	C	R	Spring	WD
149.	Blue-faced Honeyeater	C	R	Spring	WD
150	Noisy Miner	C	R	-	SWD
151	Yellow-throated Miner	C	R	Spring	WD
152	Singing Honeyeater	UC	R	Spring	SWD
153.	White-plumed Honeyeater	C	R	Spring/Summer	WD/TW
154	Black-chinned Honeyeater	R	?	-	SWD
155	Black Honeyeater	R	SM	-	WD
156.	Crimson Chat	UC	SM	-	SP/GP
157	White-fronted Chat	R	?	-	SP/M
158	Mistletoe Bird	C	R	-	WD
159.	Spotted Pardalote	UC	?	-	SWD
160	Striated Pardalote	C	R	Spring	WD
161.	Silvereye	UC	?	-	WD
162.	House Sparrow	C	R	-	Homesteads
163.	Diamond Firetail	UC	R	-	TW
164.	Zebra Finch	C	R	Spring/Summer	SP/GP/WD
165.	Double-barred Finch	C	R	Spring	WD
166.	Plum-headed Finch	UC	R	-	TW/M/GP
167.	Common Starling	C	R	Spring	M/WD
168.	Olive-backed Oriole	UC	R	-	TW/WD
169.	Spotted Bowerbird	UC	R	Spring	SWD
170.	White-winged Chough	C	R	Spring	WD
171.	Apostle Bird	C	R	Spring	WD
172	Magpie Lark	C	R	Spring/Summer	WD/M
173.	White-breasted Woodswallow	C	SM	Spring	TW
174	Masked Woodswallow	UC	SM	Spring	WD
175.	White-browed Woodswallow	VC	SM	Spring	WD
176.	Black-faced Woodswallow	C	R	Spring	GP/SP/SaWD
177	Dusky Woodswallow	UC	WM	Spring	SWD
178.	Grey Butcherbird	C	R	-	WD
179.	Pied Butcherbird	C	R	Spring	SaWD
180	Australian Magpie	C	R	Spring	AH
181.	Australian Raven	C	R	Spring	AH
182	Little Raven	UC	?	?	AH

Additional to list.

Birds recorded by R.P. Cooper, J.S.P. Ramsay, N. Chaffer and members of the Royal Zoological Society of N.S.W. during 8.11 48 to 26.11.48 but not recorded in above list..

Little Quail — major Mitchell Cockatoo.
Bustard — green Pygmy Goose
Spine-tailed Swift — white Pygmy Goose.
Fork-tailed Swift — Blue winged Parrot
Black-eared Cuckoo — Pale headed Rosella.
Orange Chat
Little Crow
English Skylark

The Gin Gin weir water would have contributed towards end of system flows into the Barwon & Darling River Floodplains or it would have soaked into the ground becoming ground water or it would have evaporated, all natural cycles that need sustaining.
The evaporation is also somebodies and some where else's future rainfall, which if caught by WaterNSW is going to be denied. This future rainfall is also future runoff and guess what has decreased into our storage dams? RUNOFF or INFLOWS or the lack thereof has caused the recent Drought of Record which is 35% of the previous DoR.
When you intensify droughts they become longer and more widespread drying out forest & rainforests and have more dry lightning thunderstorms which start fires and devastates homes communities environments and economies.
This stopping of the natural water cycle is resulting in a spiral downwards, we can only guess the next calamity. Nobody guessed the drought, the fish kills or the fires.

The fire in the Marshes last year was devastating in every way and we are all just so lucky that Mother Nature decided to end the drought and rain

because WaterNSW's management had taken the Marshes to the point of no return.
The picture below is about 20 km away at its closest point.

THE DOWNSTREAM ECONOMIC EFFECT AS A RESULT OF THE IRRIGATION INDUSTRY

The Macquarie river downstream of the irrigation industry has never had a business or economic study carried out, before development or during the irrigation industry. So it is impossible to correctly work out the business losses or the job losses downstream as a result of the irrigation industry and likewise it is impossible to ascertain the real business returns or the jobs created by the irrigation industry.

The MDBA in the Northern Basin Review did a Technical overview of the socioeconomic analysis called 'Lower Balonne floodplain grazing report' which established a loss from predevelopment of 22% in DSE carrying capacity **and** earnings have been affected by an average of 36%.
We approached the Modeller suggesting the marshes would be affected in a greater way than just a floodplain, he understood our point. and agreed we could use his results "INDICATIVELY" in the Macquarie Marshes floodplain.

Stock Numbers (DSE/ha)			
	Annual average DSE/ha	**Change from Baseline**	**Proportion of the effect of upstream development which is returned**
Baseline	0.364	0.000%	0.000%
Current water recovery	0.370	1.506%	5.360%
320GL	0.371	1.825%	6.513%
345GL	0.373	2.319%	8.320%
320GL pro-rata	0.373	2.405%	8.637%
321GL	0.373	2.459%	8.834%
350GL	0.388	6.251%	23.365%
390GL	0.392	7.122%	26.872%
415GL	0.409	11.043%	43.501%
Without Development	0.468	22.202%	100.000%

The difference in earnings between Baseline and Without Development is also slightly greater under the 27 year simulation compared with the full 100 years. Over the shorter period, the 350GL, 390GL and the 415GL water recovery scenarios all provide a marked increase in stocking rates and earnings compared with the other scenarios, as there are relatively more high-flow events in this period which favour scenarios that improve high-flows. This result holds regardless of the supplementary feeding strategy used

Table 4: 27 year simulation earnings relative to Baseline (without supplementary feed)

Earnings/ha			
	Annual average earnings/ha	**Change from Baseline**	**Proportion of the effect of upstream development which is returned**
Baseline	$12.91	0%	0%
Current water recovery	$13.15	2%	3%
320GL	$13.20	2%	4%
321GL	$13.27	3%	5%
320GL pro-rata	$13.28	3%	5%
345GL	$13.28	3%	5%
350GL	$14.31	10%	19%
390GL	$14.46	11%	21%
415GL	$15.52	17%	36%
Without Development	$20.22	36%	100%

The results from the 27-year simulation best highlight the magnitude of the potential benefits of water recovery. From the 'no supplementary feed' model highlights that water recovery can restore as much as 22% of the reduction in stocking rates and 36% of the drop in earnings caused by upstream water development. These are significant amounts for graziers. The analysis in this report also highlights that upstream water development has affected some properties more than others. Given that some places have lost more than half of all flows, large impacts are not unexpected. While the model does not account for individual businesses, it is likely that most properties on the floodplain have experienced some impacts.

The economic effect on flood plain grazing by the impact of Flood Plain Harvesting and Supplementary water take is enormous.
The changing of quantity, height and timing of flooding from no water no feed to good

water and over abundance of feed (I can show you photos of this event. 1 km apart on the same water coarse, 1) where there is no feed & cracks 12CM wide with a zero stocking rate, zero economic return (ABOVE) and

2) Feed to the top of the fences water on the ground a potential stocking rate of a beast to the hectare putting on a kg per day @ $4.50 per kg (Right & Below).
The impact of FPH and Supplementary Take can be devastating for every community downstream and the state and national interest the only beneficiary is the irrigator and potentially his local government area.

With out this extraction of water (FPH & Supplementary) in the Macquarie . The floodplain would have been wet quicker and more extensively and the response would have been greater because of the timing. The water would have become end of system flows into the Barwon & Darling River Floodplains or it would have soaked into the ground becoming ground water or it would have evaporated, all natural cycles that need sustaining. The evaporation is also somebodies/some where else's future rainfall, which if caught by FPH is going to be denied. This future rainfall is also future runoff and guess what has decreased into our storage dams. RUNOFF or INFLOWS or the lack thereof has caused the recent Drought of Record which is 35% of the previous DoR.

When you intensify droughts they become longer and more widespread drying out forest & rainforests and have more dry lightning thunderstorms which start fires and devastates homes communities environments and economies.

This stopping of the natural water cycle is resulting in a spiral downwards, we can only guess the next calamity. Nobody guessed the drought, the fish kills, the fires. I have graphs, photos etc and if i could be of extra assistance please contact me.

BUSINESS CASE POINTS for the Macquarie river re-regulator.

The Business Case Study has to take into account the full effects of the structure, including all the capital costs and opportunity costs, and the revenue that would have been generated if the water had not been extracted or stored.

For example, a $50 million capital cost needs interest costs included and justification of that selected interest rate.

An opportunity cost of that $50 million capital, as a re-regulator doesn't appreciate in value and is not saleable versus a tollway, building, port, bridge in Sydney etc...

EG: 5% interest = $2,500,000 + 5% capital gain each year = $5,000,000.00

nb (Storage assessment, general security - non environmental 12300 ML per annum)

Divided by 12300 meg = $406 per meg.

Add repairs & maintenance, staff expenses and regulatory control.

Then add downstream losses due to the changed flow regime. If the total yield of the regulator is 26.3 gl per year, the end of system flow (Bells bridge gauge) decreases by 72 megs per day average.

BUT, if the storage optimisation occurs and LTAA usage occurs, more than 26.3 GL will be removed from PLANNED ENVIRONMENTAL WATER, or 72 megs per day average at Carinda. This will leave the 'exceedance flow' at Carinda Bell's Bridge receiving ZERO '0' monthly minimum flow for 60% of months.

The Median Exceedance Flow between 1939 and 1988 was approximately 200megs/day. It will now be '0' - ie; six months of the year (median) will be ZERO '0'. It could actually be 7.2 months of monthly mean flow.

If worked on, a 'daily mean flow could be much worse.

The costs of no water in an agriculture business is bankruptcy.

There has yet to be an economic study done below the irrigation industry in the Macquarie Floodplain. The only relevant study done in the Northern Murray-Darling Basin was produced by the MDBA for the Northern Basin Review, and it was on the Lower Balonne River. Using this study indicatively, we believe an additional loss of 3% in grazing capacity and also an additional loss of 4% in earnings can be expected, leading to an additional $1,500,000.00 income/earnings loss within the grazing industry in the floodplain.

This earnings loss, when applied to a P:E ratio of 15:1 indicates a further capital loss of $22,500,000.00 in real terms over time.

Capital loss opportunity costs at 5% is $1,125,000.00 per year, divided by 12300 megs = $91.00.

On this basis, MMELA members will lose $1,500,000.00 revenue per year, and for 12300 megs, equates to $122.00 per meg just to the grazing industry.

This does not include the environmental loss, rainfall loss, or Barwon River loss.

The total cost to society per Mg gained for general security irrigation could indicatively be at least;

$406
$ 91
$122
$619.00

Other Options and related matters

When reading section 8 of the referral to the EPBC act it becomes abundantly clear that the NSW government is convinced about Climate Change and from now on there will be less rainfall, less runoff, and higher temperatures causing higher evaporation in the Macquarie Valley. The result of this Climate Change is the Yield of the river will be much lower.
Building more infrastructure does not create more water it only takes water from downstream and deliver it to upstream customers, transferring wealth and destroying the environment and economy downstream which is even dryer and hotter than it use to be.

The alternative actions are;
1) Update the Drought of Record (DoR) To secure Town water supply and other essential services.

2) Only allocate water in storage for the available water determination (AWD)

3)Direct debit of ordered irrigation water, No rainfall rejections, use it or loose it.

4)Irrigators not located in the current weir pool do not require a weir pool to pump from. The current weir pool was built 120 years ago, with modern pumps, technology, communications and computerisation. It is not actually necessary to have a weir at all for the purpose of catching irrigation rainfall rejection orders.

5)Implement full cost recovery and user pays including impactor pays. Thus minimising Community Service Obligation and until such time report the size of the subsidy publicly. This can be found in the **WaterAct 2007 Schedule 2—Basin water charging objectives and principles**

6)Now that you have seen the impact of past river management and proposed future river management.
Escalate this inquiry into a full study of the Macquarie River and the Macquarie Marshes.

7)Water NSW has proposed that the assessment be carried out by an accredited assessment process ie themselves. I strongly object to the NSW government being involved in this assessment process in any way.
It should be carried out by the commonwealth government under the EPBC Act.

8)Establish an End of System flow requirement that is compliant with an ESLT and SDL.

9)Recommend a Royal Commission into the Murray Darling Basin with open terms of reference, with pardons for initial self incriminations at the commissioners discretion and rewards for others who may be financially harmed by coming forward eg employees with the aim of creating long term intergenerational sustainability.

In Conclusion;
Thank you for taking the time reading my submission.
I have always attempted to make submissions to all enquiries involving the Macquarie Marshes, including the South Australian Royal Commission. When the next Royal Commission is called I will also make submissions in an attempt to make our environments sustainable for the next generations.

If I could be of further assistance please do not hesitate to contact me.

Dugald Bucknell

I have attached the draft Lower Balonne Floodplain grazing model report.