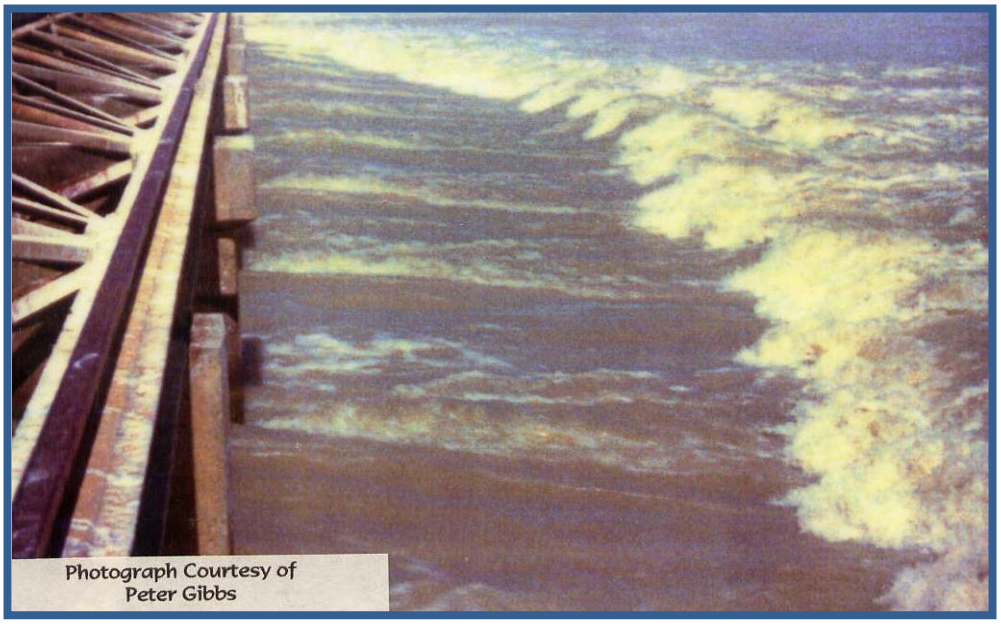
SOUTHERN FISHERMEN'S ASSOC. INC.

Lakes and Coorong Fishery

Barrage Operating Strategy

The Commercial Fishing Industry preferred Barrage Operating Strategy to gain optimal ecological benefits of freshwater released into the Coorong Estuary



Southern Fisherman's Association

September 2010

INTRODUCTION

The Southern Fishermen's Association represents commercial fishermen in the Lakes and Coorong Fishery. The fishery has been operating for over 150 years with many fishers having associations with the region for 3 or 4 Generations. Their intimate knowledge has been accumulated over many years of daily activity on the Coorong, Lake Albert and Lake Alexandrina. Their knowledge and understanding of the ecosystem should be given due consideration.

BARRAGE OPENING STRATEGY - NEED

Contrary to the belief of many people interstate and in urban areas, the release of flows into the Coorong and out to sea is not a waste. Aquatic flora and fauna has evolved over many thousands of years relying on flows for growth and reproduction.

Since the completion of the barrage structure in 1940 there has never been a formal Barrage Operating Strategy (BOS) that has considered the impacts of releasing freshwater downstream into the Coorong. For decade's commercial fisherman have watched in horror the ecological insensitive dumping of large volumes of freshwater into the Coorong region changing an often marine environment into a freshwater system within hours placing significant stress on the aquatic flora and fauna.

Often barrages would be opened then shut for short periods then opened again. This confused many species downstream affecting their breeding cycles that were dependent on a stable estuarine habitat for several continuous weeks. e.g. Black Bream and Greenback Flounder. In recent years there has been added emphasis on the diadromous species that are vulnerable to long periods of barrage closure. These species rely on migrating between freshwater and marine areas for growth and reproduction. Particularly the non-consumptive species as we now realise that these small animals are an integral part of the ecological linkages for a successful estuarine eco-system.

Lobbying from industry since the late 1980's has since ameliorated this situation with a much slower initial opening of barrages until the desired number is reached to mitigate potential upstream flooding. Conversely, the same strategy should apply when closing gates as the flows recede.

BARRAGE OPENING STRATEGY - PURPOSE

It will be critical that the release of water maximises the benefit to the broader Coorong (not just the Goolwa Channel) by diverting as much water as possible south of the Murray Mouth to ensure that it can positively influence diversity and increase the number of birds and fish. Clearly a longer release period will enhance the opportunity for fish movement into the lakes and out again in order to meet their spawning needs with a minimum of risk.

Industry's pursuit 25 years ago to implement "fishways" in all five barrage structures has had more than its fair share of hurdles. From funding short falls, lack of water to allow fishways to operate effectively, technical modifications to slow down flows through the fishways because of the significant head difference between the lake and Coorong and more recently – the mother of all droughts in the Murray Darling Basin sending the lower lakes to levels below minus 1 metre AHD providing no water for the estuary and no possible access to fish ways.

Vertical Slot Fish way in Goolwa Barrage

The objective should be to achieve the optimal ecological benefits and to keep the freshwater within the Coorong estuary for as long as practically possible, particularly in low flow and minor flood events. The current remanent estuary is only 10% of the original size pre-barrages so there will be a high level of skill needed to maximise the brackish/estuarine area within the Coorong.

To achieve these two outcomes we should also realise that Goolwa has the potential to remove the largest volume of water from the lakes in the shortest time frame and is the most direct route to the sea. This is then followed by the Ewe Island barrage in terms of volume, Mundoo, Tauwitchere and Boundary Creek.

It is clearly understood by Industry that the most ecologically productive area of aquatic systems is the estuarine region that is the interface between fresh and marine water. During small flow events this can be achieved in a number of areas within the Coorong estuary, however, once flows exceed 10,000ml/day the only large consistent estuarine area will be the region south of Tauwitchere as all the other areas northwest to Goolwa barrage will be freshwater inside the Coorong.

The chart on page 5 is a "rule of thumb" guide to releasing water into the Coorong when water is available. Industry has and still maintains that there should be a specific environmental allocation of water from the MBDA to allow the Coorong and Murray estuary to function properly as a true estuarine ecosystem on a annual basis or at least bi-annually. In the event that environmental flows are not available because of drought or perilously low storage levels in the basin then priority should given to make water available for the fishways to operate at critical times in the life cycle of many of our migratory fish. The ideal time for this water to be allocated should be during spring and early summer. The optimal benefit is to allow these fishways to operate all year round.

BARRAGE OPENING STRATEGY

Mundoo and Boundary Creek should only be used in low flow events where the estuarine interface is actually within each channel so as to not "lose" the water out through the Murray Mouth yet optimising the estuarine area. Mundoo is particularly difficult and clumsy to operate which leave this region vulnerable to large salt water ingress in times of big sea events. Astuteness and mandatory daily weather observations should underpin the use of this structure.

From an operational perspective, August, September and October can be difficult months due to the rapid changes in weather patterns, equinox, king tides and big seas. Frequent use of Mundoo, Boundary Creek and Ewe Island systems lends itself to lots of reverse head situations, sometimes patches of saltwater get landlocked in the lakes and cannot be removed because there is not enough river flow to flush the salt water out. This does not bother our native fish but sure makes the farmers and irrigators cranky.

It is important to note that the Murray Mouth has moved continually in the last three thousand years, approximately 6-8km. In the last ten years the Mouth has moved 1.8km westward and in the last three years has move 400 to 500 hundred metres southward with no freshwater flows out the mouth. Clearly this is a dynamic system while the dredging has continued to allow the oceanographic influence on the position of the Murray Mouth. The position of the Murray Mouth should be a minor consideration in any water release strategy.

PERFORMANCE INDICATORS FOR RELEASES

By using the proposed strategies suggested by industry relatively easy indicators can be used to test the success of reducing the long-term increasing salinity trends in the Coorong lagoons.

There are now several water monitors placed along the corridor of the Coorong giving real time data on salinity etc. Our suggestion for the Parnka Point salinity monitor to be 60,000EC's in mid December of every year.

The Coorong Mottled Shore Crab use to be wide spread throughout the north lagoon of the Coorong. Due to drought and very high salinities particularly in the southern areas of the north lagoon these crabs have not been in this region for 20 years. Historically they were prolific and a major food source for birds and fish. The only remnant population left is in the Murray estuary region which has severely been affected by the presence of Tube Worms forming a crust on their shells, consequently impeding their mobility.

The table below is only a guide as to how many barrage gates are open between Goolwa and Tauwitchere. However, Goolwa channel is easily remediated by small flows unlike the Tauwitchere – north lagoon area which needs large volumes of freshwater to have any impact at reducing the hypersaline nature that has reduced diversity and abundance of aquatic flora and fauna. Every opportunity to increase discharge from the Tauwitchere end should be promoted above all other structures.

FLOW	GOOLWA BARRAGE	TAUWITCHERE	TOTAL GATES
1 GL/Day	1	3	4
2.5 GL/Day	2	8	10
5 GL/Day	5	15	20
7.5 GL/Day	7	23	30
10 GL/Day	10	30	40
20 GL/Day	20	60	80
30 GL/Day	30	90	120
40 GL/Day	40	120	160

Assuming the average release per gate is 250 ML/day. However, Goolwa barrage is much deeper than all the other structures so 250ml/day is only an estimate for the "top log" out. If two logs are out on the Goolwa structure, double the flow rate. If three logs are out multiply the flow rate by 3.

Sea levels are driven by the time of the year and weather patterns so this will determine the head difference between the lake and the Coorong. This in turn will affect the flow rates out each barrage. Therefore the mid-winter average is more likely to be 250ml/day and the summer average release is nearer 300ml/day.

In-addition, if the lakes are not maintained at full supply level then the head difference between the Coorong and lakes will be smaller consequently less outflow per day as previously stated.

In the event the projected flows for 2010 exceed 500gl over the barrages then we should look at how best we can utilize these flows to gain the optimal benefits for Birds and Fish.

RELEASE	28days	56days	84days	112days
100GL	4	2	1.1	890ML
200Gl	7	4	2.4	1.78
300GL	11	5	4	2.6
400GL	14	7	5	3.5
500GL	18	9	6	4.5
1,000GL	36	18	12	9
2000GL	72	36	24	18
3000GL	107	54	36	24
4000GL	142	72	48	36

*As many numbers as possible have been rounded off to the nearest whole number.
**All figures are in gigalitres unless stated


River Murray
Lake
Goolwa
Clayton
Hindmarsh Island
GOOLWA BARRAGE
Alexandrina
MUNDOO BARRAGE
BOUNDARY CK. BARRAGE
Murray Mouth
EWE IS. BARRAGE
TAUWITCHERE BARRAGE
River Murray Barrages
Younghusband
The
Peninsula
Coorong
RiverMurray.com
North
0
2
4
6
Kilometres