MANNING RIVER ENTRANCE STUDY

BACKGROUND & ISSUES OF CONCERN

MAY 1987
MANNING RIVER

ENTRANCE STUDY

BACKGROUND AND ISSUES OF CONCERN

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This report is aimed at gathering background information about the two entrances to the river and to determine issues of concern that would need to be addressed if a full process study was to be undertaken.

The process adopted was to study the information that was readily available and to compile notes on the facts obtained. The basic sources of information that were used were Public Works Department files, hydrographic survey data, aerial photographs and various published and unpublished reports.

At the present time both entrances to the Manning River are open. However, even though the entrance at Harrington is permanent the entrance at Old Bar is considered to be non-permanent as it is subject to long periods of closure.

The entrance at Harrington although permanently open is heavily shoaled and the location of the bar outside the northern training wall means that the entrance is treacherous and the channel difficult to navigate.

The entrance at Old Bar has been open since 1973 but the situation is such that it is only a matter of time before the natural processes close it again, unless it is kept open by a flood event or by mechanical means.

The imminent closure of the entrance at Old Bar has once again raised the issue of whether this entrance should be permanently maintained or not. In addition, there are problems with the permanent entrance at Harrington.

The major issues of concern that have been identified during the investigation, so far undertaken are:

- the heavy shoaling and treacherous entrance conditions that exist at the permanent entrance at Harrington.

- the impact that the entrance at Old Bar has on flood levels and the time of inundation for various locations on the river.

- the effect, both positive and negative, that the entrance at Old Bar has on local oyster and other farming industries.

- the impact that the entrance at Old Bar has on the entrance at Harrington.

- general concern about the detrimental effect to the local community and business that the continued shoaling and erosion problems have had along various reaches of the river and its entrances.

A detailed study into the flooding problems along the Lower Manning River is currently being undertaken and it is hoped that this will provide the answers to the questions relating to flooding, as well as providing a model that may be of assistance should a full process study of the entrance be undertaken.
2.0 INTRODUCTION

The Manning River is located 360 kilometres north of Sydney and has a total catchment area of 8000 square kilometres. The main channel of the Manning enters the South Pacific Ocean at Harrington, while subsidiary channels reach the ocean 10 km further south at The Old Bar (also known as Farquhar Inlet). The locations of the entrances are shown in Figure 1.

The Harrington Entrance has extensive training walls along the northern bank, terminating in a breakwater in the northern side of the river entrance, constructed around 1904, and spur walls constructed around 1927. It is heavily shoaled by sand. The Old Bar Entrance which is subject to closure, is not trained and tends to change its position under different climatic conditions across the 2 km length of the entrance.

This present work is aimed at gathering background information about the two entrances and to determine issues of concern regarding these entrances.

Due to the limited time available to complete the investigation, only information that was readily available has been studied. Other sources of information such as Coffs Harbour District Office as well as local Council and residents, has not been considered at this stage.
3.0 STUDY METHODOLOGY

3.1 General Approach

The method used to study the conditions at both river entrances was to read and/or study the information available and compile notes on the facts obtained. The notes obtained are contained in Appendices I to III.

3.2 Information Sources

The following is a list of the information sources used for this report:

- Public Works Department files (Note: only those in Head Office or Kingswood Repository).
- Hydrographic Surveys
- Aerial Photographs
- Manning River Flood Reports
- Manning River Tidal Data
- Old Bar Coastal Erosion Study
4.0 INFORMATION OBTAINED

4.1 Public Works Department Files

The files cover the time period from 1939 to 1987 and the subject matters covered could be divided into four main categories:

- conditions at Harrington Entrance;
- shoaling, siltation and erosion along river;
- conditions at Old Bar Entrance; and
- requests for Entrance Study

During this period constant requests have been received to dredge the entrance at Harrington so as to improve the entrance conditions for easier navigation. These requests have been made by the following interested parties at various times:

- Maritime Services Board
- Manning Shire
- Local MLA's
- Local ALP Branch
- Harrington District Progress Association
- Greater Taree City Council

Further upstream of the Harrington Entrance additional representations have been made to the Department concerning the condition of the river. At Pelican Bay local oyster farmers have complained about the bank erosion near their leases and also silt of the river bed. A local boat builder has complained about the silting of the river and the difficulties associated with launching his boats and shipping them downstream to the ocean. He also suggests some loss to trade potential (eg. repair and modification work) due to the hazardous entrance conditions at Harrington Entrance. Concern has also been expressed about erosion at Mondrook Point, which is upstream of a gravel extraction site. The Greater Taree City Council, Manning River Aquatic Association and the Manning River Rowing Club have all expressed concern about the silting of the river near Taree and the adverse affects that it has had on river use. It is claimed that an annual aquatic festival, which is a big money earner for the district, is threatened by the condition of the river.

Continual representations have been made to the Department concerning the state of the Old Bar Entrance. As mentioned earlier, although presently open since 1978, the entrance is not permanent and can be subjected to periods of closure lasting several years. An early report on the file (about 1949) suggests that the entrance was open from 1886 to 1920, closed from 1920 to 1923 or 1924. Large seas are then reported to have opened the entrance in several places but closed by 1926. It remained closed until 1929 and then open until 1941. Local opinion has been divided over whether the entrance should be a permanent one and interested parties have suggested that the opening should be permanent for the following reasons:

- to maintain a satisfactory tidal range for the oyster farmers with leases in the vicinity of the entrance;
During a major flood an open entrance has the capacity to reduce flood levels and therefore flood damage.

The area, when opened, has more potential as fishing grounds.

Opposing these views have been farmers, in the lower reaches of the river, who are concerned about the loss of production due to salt load on otherwise fertile farming land and the concern about further intrusion upstream of saltwater into the river.

During the time period covered by the files several instances were noted stating the need for a major process study of these entrances. However, due to resource limitations and other priorities this study could never be undertaken.

4.2 Hydrographic Surveys

In 1980, as part of a major flood study, a complete survey of the river, including both entrances, was undertaken. From 1862 to 1933 hydrographic survey of the Manning River was available but only included data for the Harrington Entrance. From 1933 to 1980 no survey details are available.

A sand bar located outside the Harrington Entrance has meant that the entrance conditions have never been good and this is still the case.

From studying the hydrographic survey information the following summary can be made:

- 1904 to 1915 the entrance channel was basically located against the northern training wall, with a sand spit on the southern side of the entrance channel.

- 1919 the entrance channel has moved southwards a distance of about 4000 ft from the northern training wall. A large mass of sand has built up against the northern training wall.

- 1927 the entrance channel is still located in the same position, but the mass of sand against the northern training wall has grown in size.

- 1933 the entrance channel appears to be gradually moving towards the northern training wall.

The river directly upstream of the entrance channel is heavily shoaled at present and from the limited hydrographic survey data available it seems that it has always had a shoaling problem.

4.3 Aerial Photographs

Photographs are available from 1940 to 1983 covering both entrances. Although there is a large gap, from 1941 to 1964 when no photographs are available.

HARRINGTON ENTRANCE

- 1940 entrance channel located adjacent to the northern training wall with a large sand spit on the southern side.
1941 entrance appears similar to previous photograph.

1965 to 1970 entrance channel has moved southward from the northern training wall and a large sand mass has formed adjacent to the wall. Photographs show a similar situation as to the 1919 to 1927 hydrographic surveys.

1972 entrance channel has moved slightly southwards. Southern sand spit has increased in size, westward.

1974 entrance channel in similar position. Southern sand spit had decreased in size and large mass of sand against the northern training wall has also decreased in size.

1976 entrance channel has moved towards northern training wall. Large sand mass against northern training wall has changed shape and spread out along wall. Southern sand spit has grown towards the northern training wall.

1978 photograph is after the March 1978 flood. Large sand mass against northern training wall has significantly decreased in size and entrance channel has moved towards northern training wall. River shoaling has been reduced in river between entrance and deflector walls.

1979 entrance channel continues to move towards the northern training wall and large northern sand mass has continued to decrease in size.

1980 entrance channel is adjacent to northern training wall and southern sand spit has grown in size. River entrance is heavily shoaled again.

1983 entrance channel is still adjacent to northern training wall and southern sand spit has grown considerably in size. River entrance is still heavily shoaled.

OLD BAR ENTRANCE

1940 entrance channel close to southern end of opening. Large sand spits on both sides of entrance. Heavy shoaling is evident in adjoining areas.

1941 entrance appears similar to previous photograph.

1965 entrance channel is located at northern end of bar. It is flanked to the south by a large curving sand spit.

1970 entrance channel has travelled south as is narrower than before. Heavy shoaling is still evident.

1972 entrance channel has continued to move southwards.

1976 channel entrance has moved southward. Remnants of old entrance completely gone as southern and northern sand spits have grown in size. Shoaling is still evident.

1979 entrance channel is in similar position. An exposed sand bar has formed at mouth of entrance channel. Approach channels are more clearly defined and shoaling appears reduced. This improved situation is the likely results of the March 1978 flood.

1980 entrance channel has moved slightly towards the south.

1983 sand has continued to be deposited in area and entrance conditions have deteriorated. Northern spit has grown considerably in size, westward.

4.4 Flood Study

A report titled "Lower Manning Flood Study" prepared by Oceanics Australia Pty. Ltd. for the Public Works Department in January 1984 contains some preliminary information about the effects of the Old Bar Entrance on flooding in the Manning River. The report is unpublished at this stage.

The report estimated that if the Old Bar Entrance was fully closed during time of flood then for the 1% event the predicted flood levels would be increasingly higher in the lower reaches of the river:

0.6m at Harrington;
0.7m at Manning Point;
0.9m at Cuki;
0.1m at Taree; and
1.7m at Old Bar.

In addition to these higher flood levels the closure of the Old Bar Entrance would delay the flood peak by about 16 hours as well as extending the period of inundation by about 36 hours.

It was also determined that for a 1% flood event approximately 45% of the design flow would be discharged by the Old Bar Entrance, if opened, during the flood event.

It is emphasised that the results of this earlier study are very preliminary as the model used in the study was very coarse in the lower reaches of the river. A new study by Oceanics Australia Pty. Ltd. is currently underway and it will address in detail the effects of the Old Bar Entrance on the river system.

4.5 Tidal Data

Tidal data was collected from the Lower Manning on October 14, 1981 and from the Upper Manning on November 11, 1981. The locations of the data collection sites is shown in Figure 2.

The first data collection programme was concerned with measuring the tidal prisms of the entrance channels. The second exercise was concerned with monitoring flow distributions at upstream locations centered around Dumaresq Island.
Discharge and water level measurement were made at a total of 8 lines. On both occasions discharge was measured from Line 4 and water level from Tideboards 4 and 7. Temperature and salinity measurements were taken during both meterings at the deepest metering point on each line. Suspended sediment samples were also taken from these locations at peak ebb and flood flows.

4.6 Coastal Erosion Study

A draft report was prepared in 1981 by Sinclair Knight and Partners Pty. Ltd. for the Public Works Department titled "Old Bar Coastal Erosion Study". Unpublished at this stage.

From this report, information regarding the stability of the Old Bar Entrance was obtained and shown in Table 1. Also obtained from the report were comparative planforms of the Old Bar Entrance conditions, see Figure 3. These comparative planforms are based on the aerial photographs and they clearly show how active the entrance location is.
### TABLE 1 - STABILITY OF THE OLD BAR

<table>
<thead>
<tr>
<th>Date</th>
<th>Condition</th>
<th>Summary Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1818</td>
<td>Open</td>
<td>Open sufficiently to allow access for sailing vessels.</td>
</tr>
<tr>
<td>1844</td>
<td>Closed</td>
<td>As sketched on an 1862 Royal Navy Chart.</td>
</tr>
<tr>
<td>1846</td>
<td>Closed</td>
<td>A new inlet opened sometime between 1846 and 1853.</td>
</tr>
<tr>
<td>1853</td>
<td>Open</td>
<td>New channel reported to be only 4.5 feet (1.4 metres) deep.</td>
</tr>
<tr>
<td>1866</td>
<td>Closed</td>
<td>Description of vegetated sand spit blocking inlet suggests that it has been closed for a number of years.</td>
</tr>
<tr>
<td>1866</td>
<td>Opened</td>
<td>Extreme flood opened inlet.</td>
</tr>
<tr>
<td>1869</td>
<td>Open</td>
<td>Inlet stayed open since 1866, but in 1869 began to shoal.</td>
</tr>
<tr>
<td>1872</td>
<td>Open</td>
<td>Open for 1872 flood - sufficiently deep for sailing vessels.</td>
</tr>
<tr>
<td>1884</td>
<td>Open</td>
<td>Northerly spit growth.</td>
</tr>
<tr>
<td>1892</td>
<td>Open</td>
<td>Open for 1895 flood.</td>
</tr>
<tr>
<td>1900</td>
<td>Open</td>
<td>As shown on Land Board plan.</td>
</tr>
<tr>
<td>1918</td>
<td>Open</td>
<td>Inlet remained fully open since 1892, but gradually closed from 1918 to 1920.</td>
</tr>
<tr>
<td>1920</td>
<td>Closed</td>
<td>Opened by a flood on 24/9/1920.</td>
</tr>
<tr>
<td>1921</td>
<td>Opened</td>
<td></td>
</tr>
<tr>
<td>1926</td>
<td>Closed</td>
<td>Closed gradually since 1921.</td>
</tr>
<tr>
<td>1927</td>
<td>Opened/Closed</td>
<td>Easter flood opened it, but new inlet closed almost immediately.</td>
</tr>
<tr>
<td>1929</td>
<td>Opened</td>
<td>Opened by extreme flood in February.</td>
</tr>
<tr>
<td>1934</td>
<td>Open</td>
<td>As shown on a topographical survey.</td>
</tr>
<tr>
<td>1937</td>
<td>Open</td>
<td>Began to close in 1937.</td>
</tr>
<tr>
<td>1940</td>
<td>Open</td>
<td></td>
</tr>
<tr>
<td>1941</td>
<td>Open</td>
<td>Narrow channel at southern end as shown in aerial photographs.</td>
</tr>
</tbody>
</table>
TABLE 1 - continued

<table>
<thead>
<tr>
<th>Date</th>
<th>Condition</th>
<th>Summary Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1942</td>
<td>Closed</td>
<td>Closed for 1942 flood.</td>
</tr>
<tr>
<td>1945</td>
<td>Closed</td>
<td>Closed for 1945 flood.</td>
</tr>
<tr>
<td>1946</td>
<td>Closed</td>
<td>Closed for 1946 flood.</td>
</tr>
<tr>
<td>1950</td>
<td>Opened</td>
<td>Closed since 1942, opened by local residents excavating a pilot channel through sand spit.</td>
</tr>
<tr>
<td>1954</td>
<td>Open</td>
<td>Open for flood of 1954.</td>
</tr>
<tr>
<td>1956</td>
<td>Open/Closed</td>
<td>Open for flood of 1956, but presumably closed later in the year.</td>
</tr>
<tr>
<td>1957</td>
<td>Opened</td>
<td>Reopened by mechanical equipment.</td>
</tr>
<tr>
<td>1965</td>
<td>Open</td>
<td>Channel at northern end as shown in aerial photographs.</td>
</tr>
<tr>
<td>1970</td>
<td>Open</td>
<td>Channel migrating southwards.</td>
</tr>
<tr>
<td>1972</td>
<td>Open</td>
<td>Narrow channel at southern end in September.</td>
</tr>
<tr>
<td>1973</td>
<td>Closed, Reopened</td>
<td>Reopened by mechanical equipment.</td>
</tr>
<tr>
<td>1974</td>
<td>Open</td>
<td>Two entrances - new main entrance at northern end, remnants of old entrance at southern end, as shown in aerial photographs.</td>
</tr>
<tr>
<td>1977</td>
<td>Open</td>
<td>Open for the 1977 flood.</td>
</tr>
<tr>
<td>1978</td>
<td>Open</td>
<td>Open for the 1978-flood.</td>
</tr>
<tr>
<td>1979</td>
<td>Open</td>
<td>As shown in aerial photographs.</td>
</tr>
<tr>
<td>1980</td>
<td>Open</td>
<td>Inlet location moving slightly northwards since 1979.</td>
</tr>
<tr>
<td>1981</td>
<td>Open</td>
<td>Continuing to shoal.</td>
</tr>
</tbody>
</table>

* Old Bar - Loosely referred to as the Manning River South Channel Inlet, currently known as Farquhar Inlet.
5.0 CONCLUSIONS

From studying the information that has been obtained it is evident that both entrances to the Manning River have been heavily shoaled for a long period of time. At present both of the entrances are open although the entrance at Old Bar has been gradually closing over the past four years.

It appears that a pattern of shoaling may exist in the Harrington Entrance channel from the information obtained. In 1919 a large sand dag had built up against the northern training wall forcing the channel entrance southward towards the southern sand spit. This dag increased in size until it was probably flushed away in the late 1920's and the entrance channel gradually relocated itself up against the northern training wall in the early 1930's. This pattern of behaviour repeated itself in the late 1960's until the 1978 flood removed most of the dag and the channel relocated itself against the northern training wall, which is where it is today. However, the mechanism that would cause the creation of the large dag against the northern training wall is not known, at this stage. The entrance at Old Bar, unlike that at Harrington, is not a permanent entrance and it has a long history of opening and closing, sometimes for periods of several years. It appears that the normal flows along the river to the Old Bar are insufficient to maintain a permanent opening. When closed the entrance is generally opened at the northern end of the bar by a flood event, or for a flood event by mechanical means, and then depending on the magnitude of the flood the opening gradually moves southward along the bar until it closes again. At present, this entrance has been open since 1973 but the situation is such that it is only a matter of time before it closes, unless another flood occurs or it is mechanically maintained.

The imminent closure of the Old Bar entrance has once again raised the controversial question of the two entrances to the Manning River and there is a great deal of local interest in the topic and sometimes some opposing concerns. From the information that has been available the following major concerns have been identified.

1. The continued shoaling of the entrances at Harrington and the problem of the bar just beyond the end of the northern training wall combining to make an entrance that is generally treacherous and difficult to navigate.

2. The flooding problem that exists for the Manning River and the effect that the second entrance at Old Bar has on the flood levels for the river and the time that flooded lands would be inundated. Some preliminary results indicate that up to 45% of the 1% flood flow could be discharged through the Old Bar entrance and the time of inundation could be increased by up to 36 hours.

3. The detrimental effect that a permanent entrance at Old Bar would have on the local farming community due to the possibility of increased salt load on farming land from high tides. Concern also exists for those who pump water from the river about the increased salinity of the water should a permanent opening at Old Bar be created.

4. The detrimental effect that a non-permanent entrance at Old Bar would have on the local oyster farming community due to no tidal flushing as required by the oysters.
5. The possibility that, due to the normal low flow in the river, the condition of the entrance at Harrington may deteriorate even further if there was a permanent entrance at Old Bar.

6. The erosion problem at Mondrock Point, located upstream of Taree, and its relationship to the gravel extraction industry located immediately downstream of this area.

7. Continued shoaling problems at Taree and its subsequent interference to the activities of the various aquatic clubs located in the area. Also of concern is the effect of shoaling on an annual aquatic festival that is reputed to be of significant importance to the local business community.

8. Siltation of entrance to the Back Channel area and of the Back Channel itself and the detrimental effect that it is having to boating in the area.

9. Concern by oyster farmers about the erosion that is occurring in Pelican Bay and the effect it is having on the oyster leases in the area.

10. Complaints by a local boat builder about the condition of the entrance and the river and the subsequent difficulty he experiences in getting vessels to and from the ocean. The owner also states that with an improved entrance and river he would be able to undertake larger works and provide increased local employment.

11. The local progress association has also expressed concern about the loss of passing tourist traffic due to the poor condition of the entrance at Harrington.
6.0 REFERENCES

1. PUBLIC WORKS DEPARTMENT FILES
   . 1030/4 - Opening of Old Bar Entrance
   . 1030/30 Parts 1 & 2 - Manning River Dredging at Entrance.
   . 1030/48 - Manning River Erosion and Siltation.
   . 1030/60 - Manning River Entrance Study.
   . 1030/66 - Manning River Investigations.
   . 1030/68 - Manning River Shoaling and Bank Erosion.
   (Excluding Entrance and Back Channel).

2. HYDROGRAPHIC SURVEYS
   Surveys were undertaken in the following years at Harrington:
   There are no surveys of the Old Bar Entrance.

3. AERIAL PHOTGRAPHS
   All photographs are from the Cundletown series
   . January 1965 - Set 7
   . April 1969 - Set 8
   . July 1969 - Set 9
   . May 1970 - Set 1 and 10
   . September 1970 - Set 12
   . September 1972 - Set 14
   . April 1974 - Set 16
   . September 1978 - Set 17
   . July 1979 - Set 18
   . November 1979 - Set 21
   . February 1980 - Set 24
   . September 1980 - Set 25
   . August 1983 - Set 14
   . August 1983 - Set 31
   . October 1940 - Set 3
   . December 1940 - Set 3
   . 1941 - Set 4


APPENDIX 1 - FILE SUMMARY
MANNING RIVER ENTRANCE STUDY

FILE SUMMARY

R1030/30 Pt.2 Manning River Dredging at entrance

August 1963 Maritime Services Board complaint of shoaling at Harrington Entrance. Condition of bar cannot be improved without costly breakwaters.

February 1967 Request from M.L.A. for action to be taken about siltation at Harrington Entrance.

May 1967 Reply to previous request. River has always been unstable and un navigable for some time. Continuous dredging would be required. Safe anchorage 4 miles north at Crowdy Head.

December 1967 Request from Manning Shire dredge entrance at Harrington. Also request for permanent Entrance at Old Bar for flood mitigation purposes.

January 1968 Reply along previous lines.

April 1973 Request for dredging from local ALP branch.

June 1973 Reply along previous lines.

January 1974 Letter questioning effect of spur wall on the siltation of the river.

March 1974 Reply that wall does not have detrimental effect on river flow.

June 1974 Following another letter of complaint advice along previous lines given. Brief explanation of why siltting is occurring. Mention of dredging of backwater in 1970 for $15,000.

October 1974 Letter of concern by land owner at Wingham, who is licenced to pump water from river, concerned about the salt content of the river. Reply by District that Council excavated a new channel through the sand bar at Old Bar in December 1973.

January 1975 Request by local for permission to remove sand from river.

June 1975 Reply detailing further information required before consideration of application.

September 1975 Another request by local for permission to dredge backwater area. Material to be used to reclaim some land.

December 1975 On site meeting advised that no objections to dredging proposal but conditions would be set. Complaint about weed growth near public launching ramp.
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 1976</td>
<td>Request from Harrington District Progress Association to dredge entrance and backwater.</td>
</tr>
<tr>
<td>June 1976</td>
<td>Reply along previous lines. About 1961 a sand bar gradually developed on the southern side of breakwater for about several hundred metres over time. In 1976 floodwaters scoured away about 250 metres of the sand bar and the entrance is now navigable.</td>
</tr>
<tr>
<td>September 1976</td>
<td>Weed growth killed by continual fresh water due to wet weather.</td>
</tr>
<tr>
<td>April 1981</td>
<td>Letter from Greater Taree City Council requesting permission and funding for various river improvements (dredging, boat ramps, sea walls etc.)</td>
</tr>
<tr>
<td>June 1981</td>
<td>Letter from local oyster growers about closing of Old Bar Entrance and resulting damage to industry.</td>
</tr>
<tr>
<td>August 1981</td>
<td>Both letters are dependant on remedial works, which are still being investigated.</td>
</tr>
</tbody>
</table>

******

R1030/48    Manning River Erosion and Siltation.

December 1970 | Letter from oyster growers concerning silting in river and erosion near Pelican Bay.

June 1971 | Reply along previous lines admitting problem, but no funds, therefore unable to do anything.

November 1971 | Complaint from local boat builder about silting of Brown's Creek.

June 1972 | Problem could be improved by dredging, but no funds available.

September 1972 | Complaint about silting and erosion at Pelican Bay by oyster growers.

October 1975 | No objections, subject to conditions, to locals dredging their own leases.

October 1977 | Letter of complaint about silting of Harrington Entrance.

May 1978 | Reply along previous lines.

Complaint of erosion at Mondrook Point, Taree Estate. Also flooding complaint.

August 1978 | A thorough study would be required but work is not expected to commence for some time.

October 1978 | Council request to dredge and straighten a section of Brown's Creek. Looking for funds.

February 1979 | Advised no objections to dredging. However,
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 1979</td>
<td>Manning River Investigations. As part of river study request for economic study of farming and oyster farming in regard to the river. Request for aerial photography of Manning River.</td>
</tr>
<tr>
<td>November 1979</td>
<td>Request to Water Resources Commission for flood data from 1893.</td>
</tr>
<tr>
<td>November 1979</td>
<td>Request for cost estimate of hydrosurvey of river.</td>
</tr>
<tr>
<td>January 1980</td>
<td>Reply by Water Resources Commission to request for flood data.</td>
</tr>
<tr>
<td>February 1980</td>
<td>Submission for funds for hydrosurvey. Includes reasons for as well as information on existing hydrosurveys.</td>
</tr>
<tr>
<td>March 1980</td>
<td>Request for hydrosurvey to be undertaken.</td>
</tr>
<tr>
<td>June 1980</td>
<td>Letter from Council about status of Manning River Hydraulic Study.</td>
</tr>
<tr>
<td>February 1981</td>
<td>Detailed reply about progress of various aspects of report.</td>
</tr>
<tr>
<td>March 1981</td>
<td>Letter from NSW State Fisheries about vehicular access from Mud Bishop’s Point to Cabbage Tree Island.</td>
</tr>
<tr>
<td>April 1981</td>
<td>Reply to Fisheries about road.</td>
</tr>
<tr>
<td></td>
<td>Further details regarding hydrosurvey.</td>
</tr>
<tr>
<td></td>
<td>*****</td>
</tr>
<tr>
<td>R1030/68</td>
<td>Manning River, Shoaling and Bank Erosion of River (Excluding entrances and Back Channel).</td>
</tr>
<tr>
<td>November 1977</td>
<td>Council letter expressing concern about apparent silting at boat ramps.</td>
</tr>
<tr>
<td>July 1978</td>
<td>From Manning River Aquatic Association regarding river survey and build up of silt.</td>
</tr>
<tr>
<td>October 1978</td>
<td>Reply along usual lines.</td>
</tr>
<tr>
<td>February 1979</td>
<td>Minute from District Office following local meeting about condition of river and its usage. Also request for a hydrosurvey of river to be undertaken.</td>
</tr>
<tr>
<td>September 1979</td>
<td>Council letter asking when hydrosurvey would be undertaken.</td>
</tr>
<tr>
<td>January 1980</td>
<td>Reply that survey will be carried out in the near future.</td>
</tr>
</tbody>
</table>
July 1980

Request from Manning River Rowing Club to extract material from river bed to improve rowing facilities.

Advised by Dept. that approval, subject to conditions, was given for rowing club extraction proposal.

R1030/30 Pt.1

Dredging at Harrington Entrance.

September 1939 to November 1959

Deals with Harrington Entrance and its problem with siltation. Constant requests for dredging during these years. During the 1940's several plans were prepared showing some details of shoaling and channel alignment. These plans were drawn by local pilots.

*****

R1030/4

Opening of Old Bar Entrance.

June 1944

In response to request from locals for opening of Old Bar Entrance to reduce risk of flood damage, refusal to make dredge available. Request also mentioned that oyster leases in South Passage are now dormant. Inspection of entrance revealed sand bank extends back from entrance approx. 1 mile and was approx. 15 ft high.

July 1944

Partition from lower Manning landowners requesting Old Bar Entrance not be opened without considering effect of salt water entering the system and affecting the adjacent low lying farm lands.

June 1945

Request from State Fisheries to open entrance, which has been closed for 4 years.

June 1946

Request to open entrance and copy of newspaper report of local meeting. Also mentions damage caused by recent floods and support - of the whole community for opening the entrance.

1948

Continued requests to open entrance and continued refusal to allow it due to limited resources and possible damage to farmland.

1949

Continued request to open entrance. Minutes of meeting with deputation from area say that entrance was open from 1886 to 1920, closed from 1920 to 1923 or 1924. Large seas opened the entrance in different places but in 1926 these closed. It remained closed until 1929 and then opened until 1941.

Early 1950

Continued request to open entrance and continued refusal to allow it due to limited resources and possible damage to farmland.
July 1950  Flood occurred along river. Press report of opening of Old Bar Entrance by volunteers and subsequent enlargement by discharge of flood flows.

1950  Further representations to have the opening at Old Bar remain open.

April 1954  Request for PWD to keep open the Old Bar tidal Entrance. Reply that detailed study would be required to investigate the effect of two openings which cannot be justified at this time.

November 1959  Request to keep entrance open, which has nearly closed. Usual reply.

1962-63  Local resident reopened entrance just prior to a recent flood. A request was made for reimbursement of cost incurred by the resident. No payment was made.

October 1972  Request to maintain permanent opening at entrance. Entrance gradually closing.

August 1973  Continued requests to maintain opening at Old Bar by representations of fishing industry and oyster farmers. Again refused along previous lines.

August 1978  Request to keep entrance permanently open. If closed damage from recent March flood would have been significantly worse. Reply that the only effective solution is for Council to open the entrance when conditions dictated.
APPENDIX 2 - HYDROGRAPHIC SURVEY SUMMARY
HYDROSURVEYS OF HARRINGTON ENTRANCE

1862
Prior to construction of northern training wall, survey from entrance to Pelican Bay Entrance. Entrance constricted with numerous sandbanks along reach of survey. It appears that entrance would be difficult to navigate.

1888
Work had commenced on construction of training walls, but difficult to tell progress from plan. Survey from entrance to Pelican Bay Entrance. South sand spit has increased in size and grown towards north training wall, reducing entrance width. Entrance still appears difficult to navigate. Larger scale plan, 200 ft to 1 inch, reveals a channel for navigation. A section was recently dredged.

1895
Only very limited levels in vicinity of entrance. Entrance still open and navigable.

1897
Shows progress of construction of north training wall. Very limited soundings. Several minor channels completely dry at high water.

1906-07
Shows soundings from Harrington Entrance to Pelican Bay. Also shows location of complete training walls. Entrance channel adjacent to north training wall and navigable. Between channel and south sand spit, large areas of sand shifting with every tide, water 1 ft to 4 ft deep over sand bar.

1912
Shows soundings from Harrington Entrance to short of Pelican Bay. Entrance channel still adjacent to north training wall. Large sand flat growing in size between south spit and channel. Large sand flats inside entrance towards Pelican Bay. Still navigable.

1913
Shows soundings from Harrington Entrance to short of Pelican Bay. Previous entrance adjacent to northern training wall closed with sand at end of wall. Shows channel through previous moving sand bar, approx. 5 ft minimum depth. Channel still navigable. Also shows soundings for backwater. Backwater area consists of navigable channels but also large areas of sand and silt.

1915
Shows soundings from Harrington Entrance to short of Pelican Bay and also soundings for Backwater area. Entrance channel now adjacent to northern training wall. Depth varies from 8 to 20 ft for entrance. Previous channel through sand flats at entrance now gone. Appears as though some dredging or natural flushing may have improved conditions. Backwater area is still navigable but becoming shallower as sand and silt increases.
1919

Soundings from Harrington Entrance to short of Pelican Bay and also soundings for Backwater area. Large sand spit at south of entrance appears to have been washed away considerably. Entrance channel is about 4000 ft from northern training wall. Large build up of sand between channel and northern training wall. Backwater area, although still navigable, is continuing to silt up. Construction of spur walls commenced.

1927

Soundings from Harrington Entrance to short of Pelican Bay and also soundings for Backwater area. Entrance channel is still in approximately the same location, but appears wider and deeper. Sand has continued to build up on sand dune adjacent to northern training wall, and has now covered a section of the wall. Same applies to southern training wall. Channel still navigable. Backwater area continues to have a build up of sand and silt, but still navigable. Construction of spur walls from training wall complete.

1933

Soundings from Harrington Entrance to spur wall on northern training wall. Channel entrance appears to have shifted towards the northern training wall. Large sand dune adjacent to northern training wall has decreased in size and height. Channel still navigable.
APPENDIX 3 - AERIAL PHOTOGRAPHY SUMMARY
CUNDLETOWN AERIAL PHOTOGRAPHS

Jan. 1965 (Set 7) Both Harrington and Old Bar Entrances shown. Large sand build up against northern training wall. Covers wall in one area and extends well into the entrance. Sand spit on southern side also large. Entrance located roughly in middle of bar. River from entrance to deflector walls predominantly sand with only small channel.

At Old Bar Entrance the opening was located to the northern end of the bar and flanked to the south by a large curving spit.

April 1969 (Set 8) Harrington Entrance only. Sand bar to north of channel has slightly decreased in size and channel has started to form adjacent to northern training wall. Less shoaling in channel near deflector walls.

July 1969 (Set 9) Harrington Entrance only. Entrance is still very similar to before.

May 1970 (Set 1 & 10) Harrington Entrance and Old Bar. Still similar. Parallel channel has started to form in north sand spit. South spit unchanged.

At Old Bar entrance has travelled south and is narrower than in 1965. Heavy shoaling is evident.

Sept. 1970 (Set 12) Old Bar Entrance. Only limited photography but inlet appears similar.

Sept. 1972 (Set 14) Harrington and Old Bar Entrances. Entrance at Harrington appears to be shifting a little towards the south, although still very similar to before. Southern sand spit has continued to grow towards northern wall and shoaling is continuing.

At Old Bar entrance has continued to move southwards and shoaling has continued.

April 1974 (Set 15) Harrington and Old Bar Entrances. Poor quality photograph at Harrington. Northern and southern sand spits have decreased in size.

Apparently Old Bar closed during 1972-73 and a new opening was dug during 1973. Photograph shows both new and remnants of old. Sand shoals within channels appear to have gone.

Dec. 1976 (Set 16) Harrington and Old Bar Entrances (Colour). Northern sand spit has changed shape and moved toward training wall. Channel has moved northwards towards training wall. Southern sand spit has grown towards north. Heavy shoaling is still evident in river. Heavy shoaling is evident at entrance to backwater channel.
At Old Bar, old opening has completely gone as southern sand spit continues to grow in size. Northern sand spit has also grown as entrance moves southward. Heavy shoaling is evident in channels.

**Sept. 1978**
(Set 17)

Harrington Entrance only. Photographs after March 1978 flood. River entrance has been flushed, northern sand bar has largely been removed and channel has moved closer to training wall. Southern spit appears similar. Shoaling in river is reduced.

**July 1979**
(Set 18)

Harrington and Old Bar Entrances. Northern sand bar continues to decrease and channel forms closer to training wall. Southern sand spit remains the same but heavy shoaling continues around it, northwards towards the main channel. Other shoaling appears similar.

Entrance appears in similar location as before. An exposed sand bar has formed between the sides of the entrance channel. The approach channels to the entrance appear more clearly defined and the shoaling directly at the entrance appears less.

**Nov. 1979**
(Set 21)

Harrington and Old Bar Entrances. Harrington Entrance appears similar to previous photo. Amount of sand against northern wall appears to have diminished as channel gets closer to wall. Other features are largely unchanged.

Exposed sand bar, at Old Bar, in centre of channel appears to have been removed. Location of channel and shoaling patterns appear similar.

**February 1980**
(Set 24)

Harrington and Old Bar Entrances. Both entrances appear similar to previous photographs.

**September 1980**
(Set 25)

Harrington and Old Bar Entrances. The Harrington Entrance channel appears to have moved north toward training wall and is now basically parallel to it. Southern sand spit has grown considerably during this period. Channel upstream of the southern spit has continued to shoal and channel appears to be narrower.

At Old Bar the entrance has moved marginally to the north. Shoals appear to be similar in size and location.

**August 1983**
(Set 14)

Part of Harrington Entrance only. Photo's missing. Channel appears to be immediately adjacent to northern training wall. Southern sand pit has grown considerably again, nearly to edge of channel. Rest of entrance heavily shoaled.
Old Bar Entrance only. Sand has continued to be deposited in entrance. Shoaling appears worse. The sand deposited at the northern headland has grown considerably westward during this time.

Harrington Entrance. Entrance channel located against northern training wall. Large sand spit on southern side of channel. Entrance heavily shoaled. Entrance conditions appear similar to those in 1983.

Old Bar Entrance. Entrance is close to south side of opening. Large sand spits on both sides of entrance. Heavy shoaling is evident at entrance and adjoining areas.

Harrington and Old Bar Entrances. Harrington Entrance similar to 1940 photograph. Old Bar Entrance similar to 1940 photograph.
Figure 1. LOCALITY MAP
LOCATION OF METERING LINE & TIDEBOARDS

FIGURE 2
FIGURE 3(a)

19-11-40

JAN 1941

- Beaches, spits and exposed sand bars
- Areas of significant shoal formation, some of which may be exposed during low tide
- Vegetated areas, including areas of mangrove colonization

Comparative planforms of entrance configuration and shoal locations for Farquhar Inlet between 1940 - 1941
BEACHES, SPITS AND EXPOSED SAND BARS

AREAS OF SIGNIFICANT SHOAL FORMATION, SOME OF WHICH MAY BE EXPOSED DURING LOW TIDE

VEGETATED AREAS, INCLUDING AREAS OF MANGROVE COLONIZATION

COMPARATIVE PLANFORMS OF ENTRANCE CONFIGURATION AND SHOAL LOCATIONS FOR FARQUHAR INLET BETWEEN 1965 – 1970
BEACHES, SPITS AND EXPOSED SAND BARS
AREAS OF SIGNIFICANT SHOAL FORMATION, SOME OF WHICH MAY BE EXPOSED DURING LOW TIDE
VEGETATED AREAS, INCLUDING AREAS OF MANGROVE COLONIZATION

COMPARATIVE PLANFORMS OF ENTRANCE CONFIGURATION AND SHOAL LOCATIONS FOR FARQUHAR INLET BETWEEN 1972 - 1974
COMPARATIVE PLANFORMS OF ENTRANCE CONFIGURATION AND SHOAL LOCATIONS FOR FARQUHAR INLET BETWEEN 1979 - 1980

BEACHES, SPITS AND EXPOSED SAND BARS

AREAS OF SIGNIFICANT SHOAL FORMATION, SOME OF WHICH MAY BE EXPOSED DURING LOW TIDE

VEGETATED AREAS, INCLUDING AREAS OF MANGROVE COLONIZATION

FIGURE 3(d)
### TABLE I - STABILITY OF THE OLD BAR

<table>
<thead>
<tr>
<th>Date</th>
<th>Condition</th>
<th>Summary Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1818</td>
<td>Open</td>
<td>Open sufficiently to allow access for sailing vessels</td>
</tr>
<tr>
<td>1844</td>
<td>Closed</td>
<td>As sketched on a 1862 Royal Navy Chart</td>
</tr>
<tr>
<td>1846</td>
<td>Closed</td>
<td>A new inlet opened sometime between 1846 and 1853</td>
</tr>
<tr>
<td>1853</td>
<td>Open</td>
<td>New channel reported to be only 4.5 feet (1.4 metres) deep</td>
</tr>
<tr>
<td>1866</td>
<td>Closed</td>
<td>Description of vegetated sand spit blocking inlet suggests that it has been closed for a number of years</td>
</tr>
<tr>
<td>1866</td>
<td>Opened</td>
<td>Extreme flood opened inlet</td>
</tr>
<tr>
<td>1869</td>
<td>Open</td>
<td>Inlet stayed open since 1866, but in 1869 began to shoal</td>
</tr>
<tr>
<td>1872</td>
<td>Open</td>
<td>Open for 1872 flood - sufficiently deep for sailing vessels</td>
</tr>
<tr>
<td>1884</td>
<td>Open</td>
<td>Northerly spit growth</td>
</tr>
<tr>
<td>1892</td>
<td>Open</td>
<td>Open for 1895 flood</td>
</tr>
<tr>
<td>1900</td>
<td>Open</td>
<td>As shown on Land Board plan</td>
</tr>
<tr>
<td>1918</td>
<td>Open</td>
<td>Inlet remained fully open since 1892, but gradually closed from 1918 to 1920</td>
</tr>
<tr>
<td>1920</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>1921</td>
<td>Opened</td>
<td>Opened by a flood on 24/9/1920</td>
</tr>
<tr>
<td>1926</td>
<td>Closed</td>
<td>Closed gradually since 1921</td>
</tr>
<tr>
<td>1927</td>
<td>Opened/closed</td>
<td>Easter flood opened it, but new inlet closed almost immediately</td>
</tr>
<tr>
<td>1929</td>
<td>Opened</td>
<td>Opened by extreme flood in February</td>
</tr>
<tr>
<td>1934</td>
<td>Open</td>
<td>As shown on a topographical survey</td>
</tr>
<tr>
<td>1937</td>
<td>Open</td>
<td>Began to close in 1937</td>
</tr>
<tr>
<td>1939</td>
<td>Closed</td>
<td>Completely closed for 1939 flood</td>
</tr>
<tr>
<td>1940</td>
<td>Open</td>
<td>Narrow channel at southern end as shown in aerial photographs</td>
</tr>
<tr>
<td>1941</td>
<td>Open</td>
<td></td>
</tr>
<tr>
<td>1942</td>
<td>Closed</td>
<td>Closed for 1942 flood</td>
</tr>
<tr>
<td>1945</td>
<td>Closed</td>
<td>Closed for 1945 flood</td>
</tr>
</tbody>
</table>
### TABLE 1 - STABILITY OF THE OLD BAR* continued.

<table>
<thead>
<tr>
<th>Date</th>
<th>Condition</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1946</td>
<td>Closed</td>
<td>Closed for 1946 flood</td>
</tr>
<tr>
<td>1950</td>
<td>Opened</td>
<td>Closed since 1942, opened by local residents excavating a pilot channel through sand spit</td>
</tr>
<tr>
<td>1954</td>
<td>Open</td>
<td>Open for flood of 1954</td>
</tr>
<tr>
<td>1956</td>
<td>Open/Closed</td>
<td>Open for flood at 1956, but presumably closed later in the year</td>
</tr>
<tr>
<td>1957</td>
<td>Opened</td>
<td>Reopened by mechanical equipment</td>
</tr>
<tr>
<td>1965</td>
<td>Open</td>
<td>Channel at northern end as shown in aerial photographs</td>
</tr>
<tr>
<td>1970</td>
<td>Open</td>
<td>Channel migrating southwards</td>
</tr>
<tr>
<td>1972</td>
<td>Open</td>
<td>Narrow channel at southern end in sep.</td>
</tr>
<tr>
<td>1973</td>
<td>Closed, Reopened</td>
<td>Reopened by mechanical equipment</td>
</tr>
<tr>
<td>1974</td>
<td>Open</td>
<td>Two entrances - new main entrance at northern end, remnants of old entrance at southern end, as shown in aerial photographs</td>
</tr>
<tr>
<td>1977</td>
<td>Open</td>
<td>Open for the 1977 flood</td>
</tr>
<tr>
<td>1978</td>
<td>Open</td>
<td>Open for the 1978 flood</td>
</tr>
<tr>
<td>1979</td>
<td>Open</td>
<td>As shown in aerial photographs</td>
</tr>
<tr>
<td>1980</td>
<td>Open</td>
<td>Inlet location moving slightly northwards since 1979</td>
</tr>
<tr>
<td>1981</td>
<td>Open</td>
<td>Continuing fo shoal</td>
</tr>
</tbody>
</table>

*Old Bar - Loosely referred to as the Manning River South Channel Inlet, currently known as Farquhar Inlet*