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RETURNING THE TIDE TO HEXHAM SWAMP

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- The rehabilitation of Hexham Swamp

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1. INTRODUCTION

European settlement of Australia's coastline has brought major economic and social benefits, but usually at significant cost to the natural environment. One example is Hexham Swamp, formerly one of Australia's most productive wetlands which has significantly changed since construction of floodgates and levee banks in the 1970's.

As a flood mitigation project it has been extremely successful in reducing the risk of flood damage to residential and agricultural areas – but there have been great ecological, and arguably economic, costs. The Hexham Swamp Rehabilitation Project is intended to provide a reasonable balance of environmental, economic and social outcome - to restore the swamp to a healthy functioning wetland; provide educational and tourism opportunities; increase productivity of the fishing and prawning industries along the New South Wales coast; and maintain existing levels of flood protection.

2. THE HUNTER CATCHMENT MANAGEMENT TRUST

The rehabilitation of Hexham Swamp is being coordinated by the Hunter Catchment Management Trust. The Trust has the roles of coordinating and promoting the sustainable use and management of natural resources, and also identifying and rectifying degraded natural resources within the Hunter catchment on the central coast of New South Wales.

The Trust was established by the New South Wales Government in 1950, in response to widespread concerns at regular Hunter River flooding and serious degradation of natural resources. The Trust's early role was to facilitate and contribute to valley-wide flood mitigation, soil conservation and forestry programs. Its responsibilities were, however, in flood mitigation and as a result the Hunter has the largest integrated flood mitigation scheme on coastal New South Wales, with 165 kilometres of levees, 245 floodgate structures, 120 kilometres of flood drains and 266 kilometres of protected riverbanks. The Trust's early role was greatly expanded following implementation in 1989 of the NSW Catchment Management Act when its responsibilities were broadened to include Total Catchment Management, or TCM, i.e. promoting and coordinating the sustainable use and management of land, vegetation, water and other natural resources. The Trust therefore has a very valuable overview role bringing together flood mitigation and natural resource management activities to achieve a better balance of environmental, economic and social outcomes.

Among its many activities, the Trust has been working with stakeholders since the 1980's to restore some of the Hunter's estuarine wetlands lost due to 200 years of clearing, draining and filling.

In 1993 the Kooragang Wetland Rehabilitation Project was established to restore and create compensatory habitat for fish, prawns, crabs and migratory shorebirds. This twelve year $10 million project covers 1560 hectares over three sites in the Hunter estuary. In 1996 the Trust's Ironbark Creek TCM Committee finalised a strategy which identified the need to initiate a second major estuarine rehabilitation project at Hexham Swamp.

3. THE CATCHMENT OF HEXHAM SWAMP

The main tributary of Hexham Swamp is Ironbark Creek, whose catchment covers 12,500 hectares of urban, rural and forested land, and wetland, on the north western outskirts of Newcastle. The Swamp is connected to the south arm of the Hunter River, 21 kilometres upstream of its mouth.The 3,800 hectare Swamp has historically been partly freshwater, becoming increasingly saline near its junction with the Hunter River. However extensive dredging in Newcastle Harbour on the south arm of the Hunter, and filling for industry in the 1960's, appear to have significantly altered the tidal gradient causing saline intrusion to extend further into previously freshwater wetland and grazing land.

Much of the Hexham Swamp catchment is subject to severe flooding – from both local rain falling within the catchment, and also mainstream flooding from the Hunter River. To reduce the frequency of Hunter River flooding which affects urban development and grazing land, flood mitigation works were constructed in 1971 and 1972. These comprise a levee system to prevent small to medium Hunter River floods from entering the Swamp, and an eight cell floodgate structure where the Swamp joins the Hunter River. The floodgates prevent nearly all tidal flows from entering the swamp - one of the gates is slightly open in non-flood times to allow limited tidal exchange.

4. KEY ISSUES IN THE CATCHMENT

Since construction of the floodgates, more grazing land on the Swamp perimeter has become available due to reduced inundation by high tides. However, the lack of tidal flushing has dramatically changed the swamp's environment. Water quality has visibly deteriorated; the area of wetland has substantially reduced; the area of healthy mangroves has reduced by 90% from 180 ha to 20 ha and the area of saltmarsh has declined by 99% - mostly replaced by freshwater Phragmites Reed. This has had serious implications for the Hunter estuary, as it has become apparent over the last 20 years that Hexham Swamp had served as a regionally important nursery for fish, prawns and other marine organisms. This nursery had significant ecological and economic value as it formed the basis of the region's fishing and prawning industry.

In addition the Swamp provided habitat for numerous Australian and migratory waterbirds – some of them rare and endangered. Before the Swamp was drained 207 species of birds (a quarter of the known species in Australia) were identified using the Swamp. The number is now down to 40. As a result there has been strong lobbying by the fishing industry and sections of the community for the floodgates to be removed to allow the Swamp to be returned to its natural condition.

5. REHABILITATION STRATEGY

For a number of reasons individual agencies had been unable to satisfactorily address these concerns over the years, and the continuing degradation of Hexham Swamp had become a contentious community matter. Following a request from the State Government to resolve the floodgate issue the Trust initiated a 'Total Catchment Management Study' to investigate floodgate impacts and management options, and other concerns such as flooding, catchment erosion, and landuse pressures, and to determine strategies to better manage the catchment.

In 1996 the Ironbark Creek TCM Strategy recommended that the floodgates not be removed, but that operation of the floodgates be changed to allow tidal exchange and the gradual re-development of a balance of saltwater and freshwater wetlands. However this would affect almost 800 hectares of private rural land and up to 30 portions of residential land which the floodgates were originally built to protect. Essential to the success of the project would be public control of the land to be rehabilitated when the floodgates are opened. More than half of the land required was owned by the National Parks and Wildlife Service (as part of the Kooragang Nature Reserve) and Newcastle City Council. The remaining 800 hectares of land would need to be acquired, or covered by covenants to allow flooding. The estimated project cost – allowing for detailed studies, property acquisition, legal costs and limited site works- was $6.5 million.

In September 1998 the Federal Government announced funding of $900,000 for each of three years to be provided under the National Reserve System Program of the Natural Heritage Trust. In early 1999 the State Government announced matching funding. The combined grants, totalling $5.4million together with $600,000 from the Trust, and other contributions by agencies and the local community were sufficient to enable the project to commence.

6. IMPLEMENTING THE STRATEGY

One would have thought that with the in-principle support of Government, Council and community stakeholders sound progress in implementing the rehabilitation strategy would be assured. In four years since the major funding was secured thousands of hours have been invested in bringing the project to the stage where a development application for the project as a whole can soon be lodged.

Some of the factors contributing to the time consuming complexity of the process are:

- Property negotiations required with 47 landowners and seven infrastructure owners. Not all were willing participants but the Trust resolved to use negotiated voluntary acquisition in preference to resumption.
- Most land acquisitions involved subdivision complicated by adjoining landuse issues and environmental controls. In this instance rather than protecting the wetland, planning controls have delayed rehabilitation by up to 12 months
- Property purchases have required valuations, property surveys, development applications for subdivision and resolution of unforeseen legal issues.
- ‘Easements to inundate’ have required almost as much time in negotiations, valuations and legal issues as property purchases.

Unfortunately the planning instruments with which the Trust has had to operate appear to have been developed with a view to favouring land use which involves human habitation or occupation which results in destruction or deterioration of natural assets, and fragmentation of land. This rehabilitation project involves the reverse - amalgamation of many parcels of land and implementing environmental repair activities, possibilities which were apparently overlooked when the legislation and local plans were framed. In a planning and legal context it is, in this region, without precedent and among the most complex development proposals considered to date.

In addition to property matters project personnel have managed the following processes over the last six years:

- Detailed project development 1996
- Baseline ecological monitoring commenced 1997
- Negotiated Commonwealth Government funding of $2.7 million 1998
- Value Management Study 1998
- Negotiated State Government funding of $2.7 million 1999
- Negotiated Memorandum of Understanding with major landowners 1999
- Detailed inundation/flood modelling 2000
- Completed first property purchase 2000
- Draft management plan prepared 2000
- 3 year action plans prepared 2001
- Draft Environmental Impact Statement prepared 2002

Subject to satisfactory resolution of current planning and legal issues the project program is:

- Property matters to be completed 2003
- Lodge development application and environmental impact statement for entire project 2004
- Commence staged opening of floodgates 2004

7. CONCLUSION

The Hexham Flood Mitigation Scheme was developed in the 1960's at a time when communities and governments generally had a less complete understanding of coastal wetlands and their critical roles in the life cycles of marine and bird life. Since construction of the scheme the real costs have become better known, and the community and government have come to appreciate wetlands as assets to be valued. The Hunter Trust will soon be able, with the cooperation of many stakeholders, to return the tide to the largest single Hunter wetland – while at the same time being able to retain flood protection for adjacent urban areas.

The investments in cost and time, by so many, in the Hexham Swamp Rehabilitation Project have been considerable, but the triple bottom line outcomes – environmental, economic and social – will provide lasting benefits for present and future communities of the Hunter, and beyond.

REFERENCES

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- Department of Public Works, December 1972

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***Hexham Swamp Rehabilitation Project Environmental Impact Statement** (Draft)*
- WBM Oceanics