

**Balancing the Roles of Flood Mitigation
and Natural Resource Management.
Then (1959) and Now (2004):
the Richmond River perspective**

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ABSTRACT

In response to the devastating floods of 1954, local Richmond Valley councils unified to address future mitigation issues, forming Richmond River County Council in 1959. Council, in partnership with the State and Federal Government, undertook major drainage construction and flood gating of natural watercourses, such activities being representative of best practice of the time.

The management of floodplains has changed considerably since the establishment of Richmond River County Council. There is now recognition that some negative environmental outcomes resulted from floodplain drainage and the regulation of natural creek flows.

This paper outlines how operations have changed and how there now exists a need to balance natural resource management (NRM) with flood mitigation outcomes. Flood mitigation and NRM are both important to the community, and there has developed a general acceptance that both are inextricably linked through cause and effect.

The management of acid sulfate soils (ASS) is a good example of the nexus between these two important management issues. Progressive flood prevention works and drainage of swamps since 1959 increased the discharge of drainage waters from backswamps where acid sulfate soils exist. It is now widely recognised that while floodplain drainage increases agricultural productivity of these areas, such drainage also increases the volume and frequency of acid discharge.

With this knowledge it is impractical to undertake flood mitigation works and maintenance activities without considering the overall management of the floodplain's natural resources. Richmond River County Council, in partnership with state agencies, is responding to community and government expectations for flood protection with a strong focus on environmental management and repair.

This paper provides a County Council's perspective of how a single purpose strategic statutory body - is well placed to coordinate and balance the roles of flood mitigation with natural resource management on the Richmond River Floodplain.

Key words: floodplain management, acid sulfate soils, flood mitigation, natural resources

Background

As a result of the devastating 1954 floods the Richmond River County Council was formed. Council has undertaken major drainage construction and flood gating of natural watercourses. The activities were implemented with the best knowledge and practice available at the time. However, there is now the recognition of some negative outcomes from floodplain drainage and the regulation of natural creek flows. Progressive flood prevention works and drainage of swamps since 1959 has lowered the water table oxidising pyritic rich estuarine sediments forming acid sulfate soils which produce sulfuric acid in runoff.

Although ASS was present prior to flood mitigation, the impact was minimal due the slow discharge rate of acid from the backswamps where these soils exist. It is now widely recognised that floodplain drainage has increased the volume and frequency of acid discharge.

It is now impossible to undertake flood mitigation works and maintenance activity without balancing or addressing the wider management of the floodplain's natural resources.

Richmond River County Council is responding to expectations for flood protection with a strong focus on environmental management and repair. As a strategic statutory body Council is best placed to balance the roles of flood mitigation with natural resource management.

There are a number of reasons for this:

- Local government (LG) provides multiple services and operates directly with landowners and floodplain industries on a day to day basis
- A County Council's 'footprint' strategically represents the floodplain management interests of a natural catchment
- LG owns and maintains essential infrastructure
- LG has an in depth understanding of the natural processes and social issues on the floodplain and their inherent management implications
- Councils have a bi-partisan approach and an 'in depth' knowledge of multiple stakeholder concerns gained from a long history of contact with landholders, farmers, community groups, industry, tourists, state and federal governments
- LG can form specialist 355 committees like Floodplain and Estuary management committees to address NRM issues and
- Importantly, LG has a structure to action NRM plans, implement on-ground works and monitor for the long-term

This experience provides Councils with a unique insight and overview of the multiple stakeholder activity on the floodplain and an ability to identify replication of effort as well as the competition for resources. This awareness provides a key role in the successful long-term management of natural resources on the floodplain. As a statutory body the County Council has a management framework and delivery mechanisms in place to implement and expand NRM for the Richmond Valley.

Formation

Richmond River County Council was formed by proclamation of the NSW Governor General Lieutenant – General Sir Eric Winslow Woodward on 25th of November 1959 on the advice of the executive council, in pursuance of the Local Government Act, 1919.

The council was constituted with the power to exercise or perform for the benefit of the County District the powers and duties under section 494 of the Local Government ACT of 1919 for “the prevention or mitigation of menace to safety of life or property from flood”.

The Council was also delegated the powers to exercise and perform a number of other duties contained in Part XXIX of the Local Government Act 1919. These powers related to financial functions of the council and authority to perform construction of mitigation works and infrastructure on the Richmond River floodplain.

Community Expectations - Then and Now

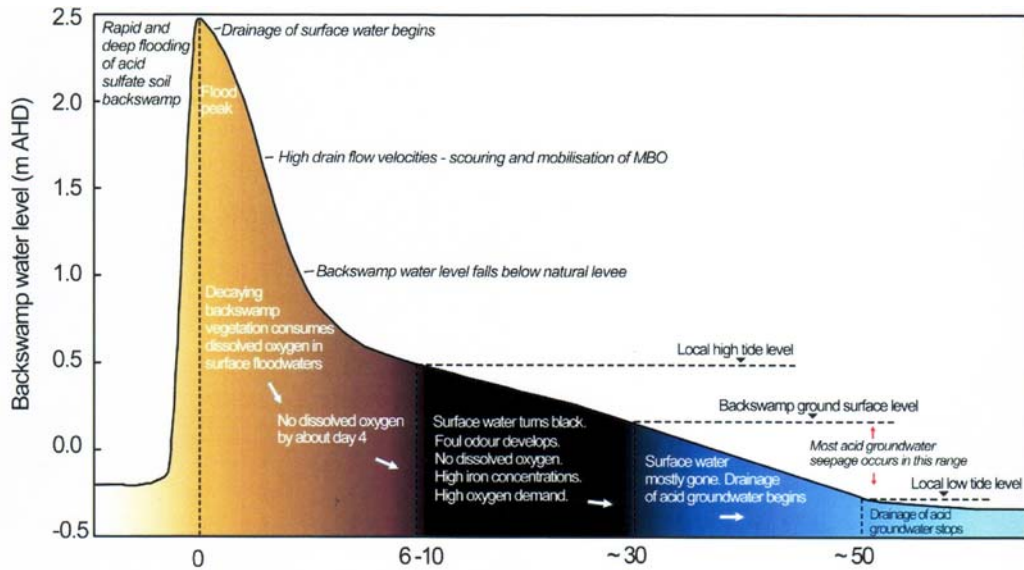
Following the 1954 floods, the Richmond community understandably expected authorities to focus on initiatives that could reduce any impacts from flooding on their property and risk to life. With the formation of Richmond River County Council in 1959 the community realised some tangible response to their concerns. Under its Charter the County Council could undertake major drainage construction and flood gating of natural watercourses. Draining, flood gating, and levee works were the three main floodmitigation activities recommended by the Richmond Valley Flood Mitigation Committee in 1958. From 1959 RRCC implemented these activities with the best knowledge and practice available at the time.

Almost half a century later communities in flood prone areas still rely on flood mitigation for protection from these impacts. However, there is now recognition of negative outcomes from floodplain drainage and the regulation of natural creek flows.

Part of the Council’s power under section 406 of the Local Government Act of 1919 was for ‘flood prevention and the draining of swamps’. This power is now available under Chapter 6 of the Local Government Act, 1993. It is the latter of these activities that is now the primary management issue directly as a result to floodplain drainage and poor water quality.

Within the Richmond floodplain there are five recognised ASS ‘Hotspots’ and a number of other active ASS areas. It is now generally accepted that this increase in drainage for flood mitigation in some areas of the floodplain has increased the volume and frequency of acid discharges from the coastal floodplain into the estuary and tributaries. Although ASS were present prior to flood mitigation, the impact was minimal due the slow discharge rate of acid from the backswamps where these soils exist. Progressive flood prevention works and drainage of swamps have lowered the water table, resulting in more acid runoff.

New guidelines for management of drainage systems on coastal floodplains (Johnston *et al* 2003) describe how water quality varies during a flood event (see Figure 1) and shows how black and acid water events occur during recession period of the flood. This identifies critical periods to reduce impacts of poor water quality on the estuary.



Source: Johnston *et al* (2003)

For these reasons it is now not possible to undertake flood mitigation works and maintenance activity without balancing or addressing the wider management of the floodplain's natural resources. Both are inextricably linked through cause and effect.

Natural Resources

The Macquarie Dictionary's definition of natural resources is:

***“resources occurring in nature that can be used to create wealth”
for example oil, coal, water, and land.***

This definition is limited to the extractive use of natural resources and would have been the general view in 1959. A world wide shift in thinking on the use of natural resources became policy with the concept of Economically Sustainable Development, a term adopted after the World Commission on Environment and Development detailed in the Brundtland Report (1987). This marked the change in the view and perception of human activity and the environment. This concept also brought about the move towards inter-generational equity. Inter-generational equity means that the generation of today does not impinge on the productivity, diversity and health of the environment but enhances it for future generations.

Natural Resource Management

Natural Resource Management (NRM) is a commonly used term by Federal, State and Local Government. NRM is defined in Farrier, Lyster and Pearson's Environmental Law Handbook as:

“land-use practices that increase production while maintaining natural capital and continuing to provide ecosystem services at local and global scales”.

The scope of NRM today needs to encompass the different natural systems that occur within the landscape. The coastal floodplain landscape comprises of river levees, wetland backswamps, creek systems, lakes and estuaries. Each component

of the floodplain comprises unique combinations of landuse, biodiversity, hydrology, and vegetation. The floodplain has become largely a wealth-creating agricultural landscape via a slow succession of changes to the natural systems, particularly the hydrological and vegetation systems. The management implication is that if you do not consider the natural resource systems, then both the ability to create wealth from agriculture and fishing or to protect the integrity of natural resources is diminished.

There are a number of legislative and government packages brought in designed to protect the natural capital. These cover all works on the floodplain and are aimed at preventing activities that will cause environmental damage. Certainly in 1959 there was no Environmental Protection Authority or other environmental legislation that Council was required to work within on a day to day basis. Examples that exist today include:

- Fisheries Management Act 1994 (NSW Fisheries)
- Threatened Species Conservation Act 1995 (NSW - NPWS),
- Water Management Act 2000 (NSW - DIPNR),
- Local Government Act, 1993 (NSW)
- the EPA&A Act
- SEPP 14 (Wetland protection,)
- Local Environment Plans (Acid Sulfate Soil provision)

Since the introduction of such legislation and plans in the early 1990's and in a response to this new era of management, Council has demonstrated a concerted effort to balance flood mitigation and natural resource management.

Natural Resource Management on the floodplain, ASS and State Government initiatives

The latest initiative in NRM from the state government is the establishment of Catchment Management Authorities (CMA), set up under the Catchment Management Act, 1989 (NSW). These CMA have replaced Catchment Management Committees and Boards.

The Catchment Management Boards developed natural resource management plans or 'blueprints'. The plans are intended to direct NRM effort and initiatives on a regional basis, while the blueprints identified five natural resource Catchment Targets (CT) and relied on partnerships to implement the on-ground actions. One of the primary CT in the Richmond catchment is acid sulfate soil (ASS).

State Government's interest in ASS management at the local government level had been increasing since the early nineties, and preceded the establishment of catchment management boards. A number of programs guided largely by the NSW Government Acid Sulfate Soils Advisory Committee were developed. These programs were designed to enhance ASS management at a number of levels including planning, regulation, awareness and on-ground management.

One of the first initiatives was the mapping of high risk ASS areas by Naylor *et al* (1995) with a further mapping exercise by (Tulau and Naylor 2000).

Building on the ASS mapping exercise of 1995 the (then) Department of Land and Water Conservation (DLWC) prepared a review of ASS in NSW. This review identified what were considered then to be High Priority Management Areas or 'hot spots' on the NSW coast (Tulau 2000). This document formed the basis of a two-

stage on-ground implementation program developed to remediate or better manage these hot spots. While funded and supported through State Government agencies, the implementation invariably rests primarily with local government and in particular Councils, who are in the best position to provide the approach appropriate for their particular area.

The increased responsibility of local councils in implementing state-initiated programs is further demonstrated in the area of ASS management. In 1999 the State Government, through the Department of Urban Affairs and Planning (DUAP), directed coastal councils to amend their Local Environment Plans (LEP) to include a Development Control Plan (DCP) for ASS (Tulau 2000). One exemption from the LEP is the sugar industry, which operates under an audited best practice management arrangement with DUAP. The end result is that local government now has the responsibility for on-site auditing of cane farms under their best practice management exemption, reviewing development applications (DA) for those outside any such exemptions and assessing ASS management plans.

Resources for Local Government

Additional resources for effective floodplain management - both human and financial is an issue of concern for many Councils. Brunchhorst (2002) comments that 'the trend of devolving responsibility to local government by the state government is not accompanied by adequate resources'. If this is in fact the case, then it follows that however willing local government is to pursue wider environmental management goals, its capacity to deliver state requirements will be hampered.

Nevertheless the management of the floodplain natural resources for local government is an on-going reality. In the absence of sufficient state government funds, the success of any Council to incorporate this new responsibility will depend on their capacity to absorb the costs within its current resource base or identify other local resources or collaborative partnerships.

The extent and scale of floodplain issues in the Richmond was the primary motivation for RRCC to form the Richmond Floodplain Committee (RFC), a Section 355 committee of Council. The role of the RFC is to strategically coordinate natural resource management for the Richmond River floodplain and estuary.

The RFC comprises representatives from State agencies, local Councils, agricultural industries and Southern Cross University. It is through the RFC that a balance of responsibilities for NRM on the Richmond Floodplain can be achieved, together with sharing of resources and technical support for Councils. This local initiative works in partnership with State initiatives and policy, and aims to provide the basis for long term effective management for the Richmond floodplain and estuary.

Concluding Remarks

Clearly the community's expectations of the County Council and its role in flood mitigation in the mid 20th century were formed without the awareness and knowledge that is available today, with the understanding of cause and effect from drainage and flood mitigation developing since the early 1990s.

The management of floodplains is a long-term issue and the role of local government in this process is a key to its success. In order to meet the expectations of the community in sustainable floodplain management and in order to balance the roles of flood mitigation and NRM, solid partnerships with state agencies and community

groups are required. This means that resources in both in personnel and operational funds need to be proportionate to the size of the problem.

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