Coastal floodplains drainage project

What we heard report

Water management

April 2022

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Acknowledgement of Country

The Department of Planning and Environment acknowledges the Traditional Owners and Custodians of the land and waters on which we live and work and pays respect to Elders past, present and future.

Aboriginal people are the Traditional Owners of the NSW marine estate and have a continuing connection to their Land and Sea Country. We acknowledge that water, floodplains and estuaries hold great spiritual, cultural and economic importance and are central to Aboriginal culture, society and wellbeing.

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Photo: Department of Primary Industries

Executive summary

During 2020 and 2021, a state government interagency group led by the Water branch of the Department of Planning and Environment consulted with targeted councils and peak bodies on the coastal floodplains drainage project, a NSW Marine Estate Management Strategy 2018-2028 project.
The interagency group has representatives from Department of Primary Industries (DPI) — Fisheries and the Planning, Crown Lands, Natural Resources Access Regulator and Environment and Heritage groups within Department of Planning and Environment. This document summarises what we heard during these consultations.

What is the coastal floodplains drainage project?

A coastal floodplain is the low-lying, generally flat land surrounding an estuary. In their natural state, coastal floodplains flood during high tides or after heavy rainfall. Many of these areas have been artificially drained and floodgates installed to keep out high tides. This has allowed these areas to be used for many purposes, including urban development and agriculture.

The water drained artificially from coastal floodplains can cause water pollution under certain conditions. This can have a negative impact on the health and biodiversity of the estuary and reduce the social and economic benefits of aquatic industries, such as fishing and tourism.

The Marine Estate Management Strategy recognises the potential water quality impacts of coastal agricultural floodplain drainage works and activities. It further acknowledges that the regulatory regime for these works and activities can be costly, time consuming and unclear for local councils and landholders. The aim of the coastal floodplains drainage project, established under the Marine Estate Management Strategy, is to reform and improve the regulatory framework for coastal agricultural drainage works and activities by reducing:

- the impact of these works and activities on downstream water quality, aquatic ecosystems, communities and industries
- the complexity, time and costs associated with the planning and approvals process.

Consultation

In 2020 and 2021, following research on the floodplain drainage regulatory regime, the interagency group consulted with relevant local councils and peak bodies to:

- gain a better understanding of stakeholder concerns with the current regulatory framework for drainage infrastructure and the impacts of this infrastructure on water quality
- help identify potential solutions for a simpler, clearer and more effective approach to the drainage regulatory framework.

Photo: Department of Primary Industries

What did we hear?

A general overview of the key issues raised during consultation is outlined below. These issues are explored in further detail, along with suggested solutions, later in the report.

Ownership, maintenance and responsibility for drainage infrastructure assets

- Lack of clarity regarding responsibility for, and role in infrastructure management and maintenance. This is due to land ownership complexity — with a mix of Crown land and multiple private landholders — and variability in how drainage infrastructure is owned and managed between local government areas.
- Concerns about being left with the financial and regulatory burden for drainage infrastructure on Crown and private land, including for assets 'orphaned' as a result of the loss of private drainage boards (also known as 'drainage unions').
- Lack of funding to improve or maintain floodplain infrastructure, particularly for industries already facing viability issues, as well as concern with the cost of, and potential liability for, infrastructure asset failures.

Assessment, approvals and planning for drainage infrastructure assets

- Regulatory complexity can cause significant delays in drainage infrastructure maintenance, particularly where a Crown Lands branch approval is required.
- Need for communication and coordination across multiple state agencies, each with separate approval processes, can cause disjointed and lengthy regulatory and licensing processes.
- Few private landholders are applying for approvals to undertake drainage maintenance as they are either unaware of responsibilities, exempt from approval requirements or choose not to apply.
- Lack of compliance activity to ensure approvals are being sought and conditions complied with.

Development approval requirements

- Lack of awareness among some landholders of local council development approval requirements for works in mapped acid sulphate soil areas.
- Concerns with the complexity of approval requirements under State Environmental Planning Policy (Coastal Management) 2018 (Coastal Management SEPP). This includes approval requirements for wetland restoration, rehabilitation and flood mitigation, and the viability of agricultural activities in and around mapped coastal wetlands.
- Requests for streamlined approval pathways for low-risk activities or environmental works.
- Concerns about the accuracy of mapping under the Coastal Management SEPP.

Photo: Peter Robey/DPE

Supporting improved water quality outcomes

- Concern about the impacts on aquatic ecosystems from existing agricultural activities that rely on extensive drainage of low-lying areas, as well as land use changes such as urbanisation.
- Concerns from downstream industries about a lack of appropriate action, including regulatory action, to prevent major blackwater events and the associated environmental impacts, which can result in fish and shellfish deaths. Some are concerned about the future viability of water-based industries, such as oyster growing.
- Acknowledgement that acid sulphate soils and blackwater are serious environmental issues.
- Need for research and improved understanding of best practice infrastructure maintenance (e.g. when and how to undertake maintenance) to reduce environmental impacts.
- Requests that non-regulatory options to achieve water quality improvement should be considered.
- Varied views on whether water quality impacts arise from lack of compliance with best practice standards or from inappropriate land use in low lying areas.

Need for improved education/ information

- Concerns that many private landholders are not aware of their responsibilities for approval requirements. Some private landholders are seen to be insufficiently engaged in floodplain issues and unaware of their potential to help improve environmental outcomes.
- Desire for state government agencies to better integrate research and mapping by other key stakeholders into their approval processes to improve collaboration, knowledge sharing and engagement.
- Requests for improved consideration of climate change impacts in vulnerability mapping and assessment, particularly around sea-level rise and flooding.

Social, cultural and heritage values

- A need for an improved understanding of Aboriginal landscape management and more engagement with Aboriginal communities.
- There is a strong relationship between local social and cultural values, water quality outcomes and floodplain management.

1 Background

The coastal floodplains drainage project (the project) commenced in 2019. In 2020 and 2021, after researching the issues, the project's interagency group selected a cross-section of affected stakeholders and asked for their input and information on water quality and approval issues related to floodplain drainage works.

1.1 Why did we consult?

The interagency group wanted to:

- gain a better understanding of stakeholder concerns with the current regulatory framework for coastal floodplain drainage infrastructure and the impacts of this infrastructure
- help identify potential solutions for a simpler, clearer and more effective approach to managing the issues.

1.2 Who did we speak to?

We sought advice from:

- local councils that currently manage NSW's coastal floodplain catchments where widespread agricultural floodplain drainage has occurred over many decades (Table 1)
- peak groups/organisations representing agricultural, fisheries and environmental interests.

Local councils in areas with little to no tidal floodgate infrastructure or large-scale coastal floodplain drainage were not engaged in this early consultation phase.

Representatives from the Department of Planning and Environment's Water group also took the opportunity to meet with some Aboriginal stakeholders by co-ordinating with a separate consultation process in May 2021 to gain an early insight into Aboriginal concerns and values. We visited the Minjungbal Aboriginal Cultural Centre to meet with Tweed Byron Local Aboriginal Land Council and the Tweed Aboriginal Co-op, and the Arakwal office to meet with Bundjalung of Byron Bay Aboriginal Corp and Arakwal Corporation and noted their concerns specific to coastal floodplains. This will help inform how we meaningfully and effectively engage with Aboriginal communities in later stages of the project.

We will engage with more stakeholder groups and the general public in the next phase of consultation, to seek feedback on reform options.

Table 1

Key stakeholder consultation meetings with interagency working group members

Local councils	Date
Rous County Council	2/09/2020
Tweed Shire Council	15/09/2020
Richmond Valley Council & Ballina Shire Council	16/09/2020
Byron Shire Council & Lismore City Council	13/10/2020
Clarence Valley Council	21/10/2020
Port Stephens Council	28/10/2020
MidCoast Council	5/11/2020
Maitland City Council	10/11/2020
Kempsey Shire Council	30/11/2020
Shoalhaven City Council	9/12/2020
Newcastle City Council	10/12/2020
Peak groups	**Date**
NSW Shellfish Committee	10/02/2021
Australian Macadamia Society	18/02/2021
NSW Farmers Association	24/02/2021
NSW Cane Growers Association	10/03/2021
Nature Conservation Council	26/04/2021
Professional Fishers Association	3/05/2021
Aboriginal organisations (met with the Department of Planning and Environment's Water group)	**Date**
Tweed Byron Local Aboriginal Land Council and the Tweed Aboriginal Co-op	24/05/2021
Bundjalung of Byron Bay Aboriginal Corp and the Arakwal Corporation	26/05/2021

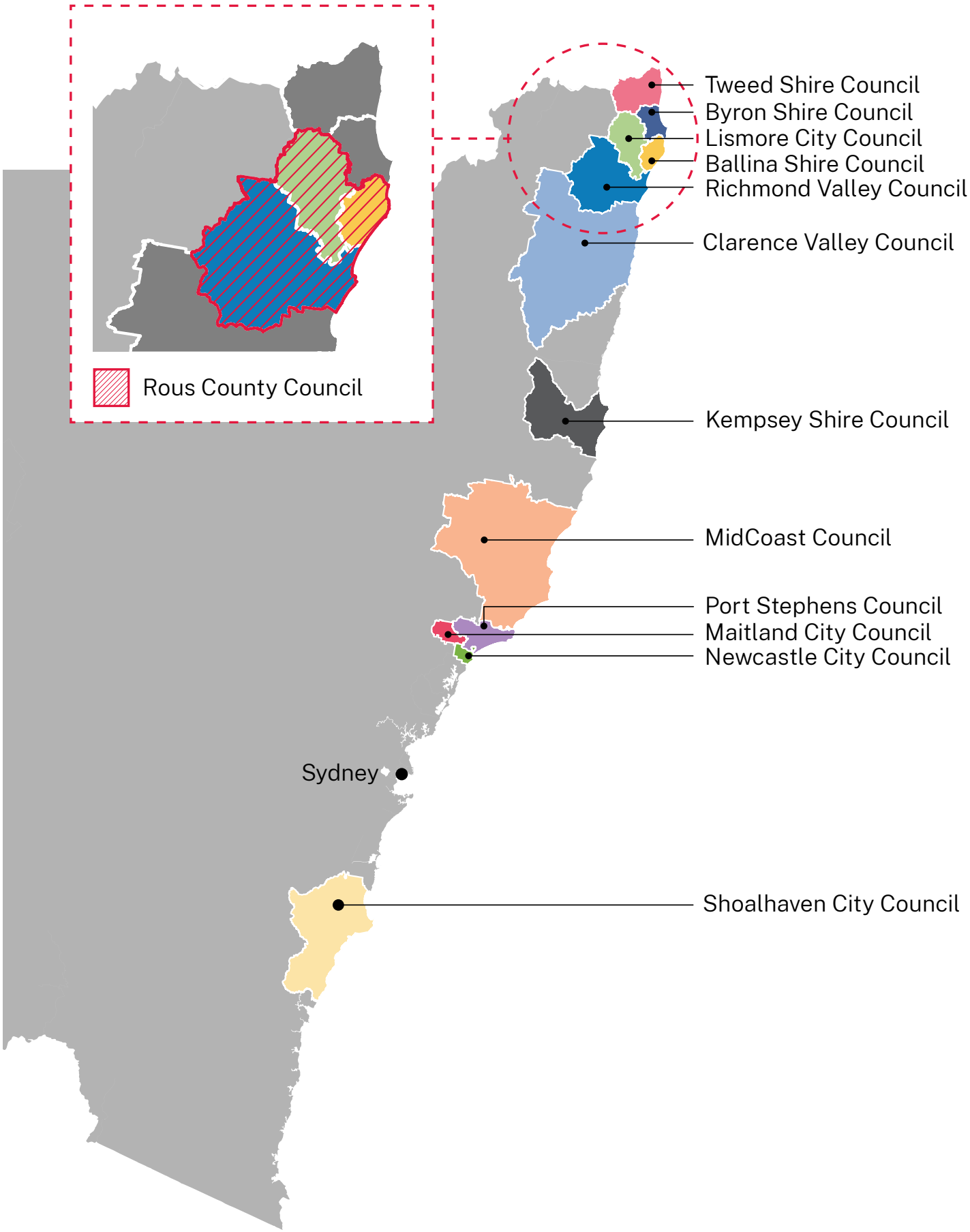

Figure 1:

Local government areas consulted for the coastal floodplains drainage project.

Photo: Department of Primary Industries

1.3 How did we consult?

Stakeholders were emailed a letter inviting them to meet with members of the interagency group.

COVID-19 requirements meant meetings were held online, other than a face-to-face meeting with the NSW Cane Growers Association in March 2021, and the 2 meetings held with Aboriginal stakeholder groups in May 2021.

Topics for discussion included:

- agricultural drainage infrastructure (drains and associated floodgates) ownership, maintenance and planning
- asset maintenance approval pathways, including current processes and issues
- opportunities to improve approvals and strategic planning processes
- compliance activities to support improved water quality
- the presence and activity of private drainage boards.

2 What we heard

This section outlines broadly what we heard from each group of stakeholders on the topics that were discussed.

2.1 Local government

Overview

Generally, local councils were concerned about the complexities of the current regulatory framework, noting that several state government agencies are involved in managing and regulating coastal floodplain drainage and infrastructure. They noted confusion around the roles and responsibilities of each agency, as well as a perceived lack of compliance action by state government to enforce the existing regulatory requirements.

Councils requested greater coordination and collaboration amongst state agencies and key stakeholders, recognising the establishment of the interagency working group as a positive step. Recent improved engagement and communication between DPI – Fisheries and local councils about approval processes was appreciated and suggested as an example for other agencies.

Councils noted a lack of community awareness about approval requirements, suggesting some private landholders found it easier to avoid seeking approvals and risk the small chance of compliance action than navigate complex approval processes. Some private landholders, particularly in northern NSW, believe maintenance of drainage infrastructure is local government's responsibility. Local farming communities have expressed frustration with these councils about their lack of authority, funds or resources to properly manage drainage infrastructure.

Some councils suggested a simpler, risk-based regulatory framework that allows local councils to conduct basic maintenance through a more streamlined and strategic process. It was felt that this approach would be more transparent and timely in assessing council approvals, particularly where infrastructure is on Crown land.

Key issues and stakeholders' proposed solutions

Confusion about ownership and responsibility for floodplain drainage infrastructure assets

The way local government manages, maintains and shares responsibility for floodplain drainage infrastructure is highly varied. Some councils take primary responsibility for all floodplain drainage infrastructure in their local government areas, including:

- Clarence Valley Council, which carries out maintenance on drains and floodgates on private and Crown land as well as council-owned land. However, it is considering a shift towards managing floodgates only as a means of protecting Grafton and Maclean from flooding
- Port Stephens Council, which takes responsibility, either solely or in partnership with federal, state and regional organisations (private drainage boards), for most floodplain drainage assets
- Rous County Council, which takes primary responsibility for drainage assets within its member council areas, following the same process of private landholders to assess flood mitigation and within the specific powers defined in its charter.

Other councils work with private drainage boards, regional organisations and private landholders to manage the infrastructure in their local government areas. Where a drain passes through multiple landholdings, this can significantly increase the complexity and cost of managing works.

Councils observed that they are being asked to take on more responsibility for drainage infrastructure maintenance. Some attribute this to the loss of private drainage boards, which have experienced declining membership due to land use shifting away from agriculture. No new private drainage boards have been created since the *Water Management Act 2000* commenced in 2001.

Photo: Department of Primary Industries

There is confusion about the relationship between private drainage boards and local councils. Private drainage boards are seen as accountable to, but not actively managed by, Department of Planning and Environment –Water, under the Water Management Act. There was a desire that roles and responsibilities for management of floodplain drainage works be better communicated to private drainage boards, local councils and other landholders.

Regardless of management roles, almost all councils identified issues and confusion about ownership and maintenance of infrastructure, including responsibility for assets on Crown land and private land. It is unclear how responsibility is shared with the NSW Government.

Northern councils noted that some landholders view maintenance of drainage works as the responsibility of government, particularly as much of the drainage infrastructure was originally (several decades ago) built and funded by government. For instance, Port Stephens Council has had numerous conversations with landholders explaining that the drains are not council assets and there are financial and probity issues if council undertakes works on these drains.

Ballina Shire Council noted the complexity of the approval process for drains that run through more than one property and acknowledged that some maintenance requirements are beyond the financial or physical capabilities of private property owners. To some extent, councils are prepared to assist landholders in maintaining drains, but are concerned by lack of funding, potential liability issues and difficulties obtaining access to private property.

Opportunities stakeholders identified for improvement

MidCoast Council suggested that an education piece about the capacity and role of private drainage boards would be useful.

Councils requested the NSW Government improve and maintain engagement with all stakeholders, including councils and landholders, on coastal agricultural drainage issues.

If the approval process is streamlined, some councils could take responsibility for drainage maintenance works through a fee-for-service model. This would require clarity around liability, charges and funding.

Photo: Department of Primary Industries

Multiple approval processes across different agencies

Councils noted that several state government agencies are involved with floodplain drainage, suggesting this results in:

- different timelines and requirements due to regulatory complexity and siloed agencies
- a confusing array of exemptions under different Acts and planning instruments
- delays of 6 to 12 months for works located between a floodgate and a watercourse, particularly on Crown land[1]
- confusion amongst private landholders as to what approvals are required.

Several councils noted that established relations with DPI — Fisheries were helpful, along with streamlined processes under State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP). However, they reported being frustrated with delays in Crown Lands branch licence processing and questioned the need for site-by-site assessment.

Clarence Valley Council identified additional steps and time associated with approvals sought in land subject to native title claims.

Opportunities stakeholders identified for improvement

Councils suggested the NSW Government provide further education about what activities require approval or processing by state agencies.

Councils also suggested that the complexity and length of approval processes could be improved by:

- targeted and proportionate regulation that focuses on high-risk areas and activities on a floodplain, using a transparent risk-based assessment
- allowing environmental protection and improvement works to be undertaken as exempt development under the Infrastructure SEPP
- providing extended (for example, 5-year) approvals and permits for works
- improving the efficiency, transparency and speed of Crown Lands branch approval processes. This might mean better resourcing or a strategic approach, such as a blanket licence for Crown land floodplain works under an overarching policy
- a collaborative approach across relevant state agencies to simplify and coordinate the approvals process.

Clarence Valley Council suggested supporting local government to engage with Traditional Owners through Indigenous land use agreements could help to improve timelines for licensing floodplain drainage management works.

[1] Reported by Tweed Shire Council, Ballina Shire Council and Clarence Valley Council.

Photo: UNSW Water Research Laboratory

Regulatory complexity — development approval

Several councils expressed uncertainty about the relationship between the Coastal Management SEPP and the Infrastructure SEPP, especially assessment and approval requirements for environmental protection works, including wetland restoration.[2] Some requested greater clarity, flexibility and simplified assessment processes for environmental works.

Tweed Shire, Clarence Valley and Port Stephens councils noted that the Coastal Management SEPP captured more projects as designated developments than the SEPP it replaced, as more land is now mapped as coastal wetland. This has made some projects/works more costly as they now require an environmental impact statement. Tweed Shire Council suggested the wetland mapping needed more refinement.

Opportunities stakeholders identified for improvement

Generally, councils suggested that these issues could be addressed by:

- providing additional guidance on the Coastal Management SEPP, including requirements for environmental protection and wetland restoration works
- clarifying what 'routine maintenance' can include under the Infrastructure SEPP
- further refining coastal wetland mapping under the Coastal Management SEPP.

Compliance issues

Most councils said that private landholders seldom apply for development approval for drainage maintenance works. In some instances, they are exempt from development approval requirements but many landholders are unaware of their responsibilities or choose not to apply. Councils suggested that rules and regulations are ineffective if landholders do not understand the need for an approval process.

Councils noted difficulty in undertaking drainage approval compliance activities due to major resourcing and funding shortfalls. It was acknowledged that current arrangements do not appear to be achieving optimal environmental outcomes.

Opportunities stakeholders identified for improvement

Councils suggested the need to:

- engage with private landholders to raise awareness of the approvals required, as well as the broader operation of the floodplain drainage system
- provide a 'one-stop shop' for information for landholders about approval processes and requirements
- improve compliance through a more proportionate, risk-based approach to regulation.

[2] It is unclear whether these councils are aware that a more streamlined approval process for environmental protection works already exists under the Coastal Management SEPP.

Financial costs of managing drainage infrastructure

Maintaining drains was identified as a financial and regulatory burden for local councils. While there are grant opportunities, the base funding for drainage works has not increased in decades. Councils expressed concern about liability and risks associated with floodplain infrastructure management, maintenance and approvals process, particularly in the event of drainage failures. Climate change impacts, including more major flooding events, are adding to the costs and risks.

Local councils have moved away from maintaining drainage works, particularly on non-council land, due to funding constraints. Even for councils that have had rate variations approved (Clarence Valley) or that receive state funding (Shoalhaven), drainage works remains a major funding and resource burden. As a result, some councils only allocate resources and funding to works if they are confident that they will be approved.

Concern was expressed that reforms associated with this project may require councils to undertake further compliance activities without adequate resourcing. Councils would like to be confident that they can get help and expertise to process approvals and achieve better environmental outcomes.

Opportunities stakeholders identified for improvement

- Tweed Shire Council suggested that the state government fund an east coast floodplain management strategy. This would include supporting improved drainage infrastructure and protection/enhancement of riparian vegetation.
- If councils are to be more involved in coastal agricultural drainage works, councils indicated that they would need additional resourcing and specialist support.

Mitigating acid sulphate soil and other major environmental impacts

Councils acknowledged that local waterways on floodplains are under high environmental stress. Several councils including Tweed Shire, Port Stephens and MidCoast councils noted that acid sulphate soil remains a significant issue, especially where landholders want to maintain the depth of drains that were dug too deep. Exemptions under local environmental plans for cane growers were also identified as potentially causing sub-optimal outcomes.

Several councils acknowledged that siltation is causing major environmental and economic concerns, which can create conflict – for example between agriculture stakeholders and fisheries stakeholders. In some instances, drain blockages have not been removed due to issues with the current approval regimes and concern about environmental impacts.

Agricultural industries along the north coast are keen for councils to undertake dredging works to reduce siltation. However, these councils noted that the work is costly, lacks a clear evidence base indicating its effectiveness, and, in some areas, can affect sensitive environmental ecosystems.

Some councils noted inconsistency in drain design across the state. Some farmers want deeper, wider and straighter drains, where others — mainly in the more southerly parts of the coast — have shallower, wider drains. Drain design can affect the severity of associated environmental impacts.

Opportunities stakeholders identified for improvement

Suggestions to address these issues included:

- exploring the reuse of acid sulphate waste soil material under the Protection of the Environment Operations (Waste) Regulation 2014 Waste Management Guidelines to minimise costs and resource losses to councils
- apply or update the MidCoast Council's drain maintenance guidelines for acid sulphate soil (as referenced in the former Greater Taree Development Control Plan) beyond the MidCoast local government area
- develop standards and/or a code of practice for drain management and maintenance that accounts for key constraints such as acid sulphate soils
- state funding to build a knowledge and business case on how to manage drains to support environmental and economic outcomes.

Photo: UNSW Water Research Laboratory

Viability of existing agricultural uses and climate change (sea level rise)

Some councils noted that urbanisation and associated land-use changes are causing more flood water volumes and water quality issues, both of which are likely to be exacerbated by climate change and sea level rise. As a result, some low-lying areas of drainage networks may no longer function in 10 to 15 years.

With major flooding likely to increase in frequency, councils noted that state government needs to address the future non-viability of existing land uses on low-lying land and the limitations of floodplain infrastructure to maintain historic land uses.

Opportunities stakeholders identified for improvement

Councils suggested the state government should:

- support climate change vulnerability mapping and assessment
- establish clear policy about sea level rise and tidal inundation
- undertake coordinated engagement of floodplain stakeholders with councils on how to respond to climate change impacts on floodplains
- be transparent about the future viability of some agricultural ventures and provide support where necessary
- consider buying properties to add to the national park reserve if they can no longer viably operate as agricultural ventures.

Value of knowledge sharing

Councils emphasised the role of knowledge sharing, not just between state and local government but also with external research and academic organisations. Partnerships with research and academic institutions have supported water quality initiatives with varying levels of success.

Some noted the importance of improved understanding of Aboriginal landscape management through engagement with Aboriginal communities. Finalising the Hunter River Flood Mitigation Scheme's Aboriginal Cultural Management Strategy was highlighted as an important element of these efforts.

Opportunities stakeholders identified for improvement

Councils supported increased funding for floodplain research, with outcomes communicated to key stakeholders.

In order to share data, learnings and initiatives being undertaken by other councils, it was suggested the state government support an ongoing knowledge-sharing forum.

Photo: Geoff Maddock/Flickr

2.2 Industry and peak groups

Overview

Peak bodies noted a diverse range of interests and standpoints on floodplain drainage management and regulation that were often sector-specific. Common themes included:

- water quality issues, specifically acid sulphate soils and dissolved oxygen impacts from blackwater events, which can directly affect the viability of aquatic industries
- the complexity of existing regulation and ownership of water drainage infrastructure, including prescriptive approaches that don't address different environmental factors and industry needs
- a lack of resources, funding and commitment to addressing significant issues, most urgently to support improved compliance and water quality improvements.

Stakeholders discussed the effect of legacy issues but differed on preferred solutions, for example:

- the NSW Cane Growers Association supported increased exemptions for the industry to reduce the financial burden of approvals
- the NSW Farmers Association supported education rather than enforcement to address environmental impacts, particularly in relation to historically dug drains
- downstream industry groups and the Australian Macadamia Society felt landholders should modernise their management approaches and some supported greater compliance activity.

Key issues and proposed stakeholder solutions

Responsibility for floodplain drainage maintenance and management

Some agricultural stakeholders were concerned about the lack of maintenance of drainage infrastructure, particularly the removal of build-up in drains. Some noted that organisations such as Rous County Council have not been clearing as many drains as they did in the past because of uncertainty about obtaining approval from DPI — Fisheries due to mangrove growth.

Cost and potential liability if infrastructure failed were identified as key factors in lack of works. The NSW Cane Growers Association noted the difficulty, even for councils and private drainage boards, to gain approval and fund the works needed to carry out essential maintenance of drains.

Opportunities stakeholders identified for improvement

- The NSW Cane Growers Association suggested private drainage boards had been effective and supported continuing this model for collective drainage management.
- Some stakeholders stated that they would be open to considering a pay-for-service arrangement to clear drains.

Regulatory complexity

There was general agreement regarding complexity, confusion and delay in gaining approvals for works, especially drain clearing, but a variety of views on how to address this. For example, the NSW Cane Growers Association supported ongoing or increased self-regulation with limited formal approval requirements, while the NSW Farmers Association suggested a need for improved education and compliance with best practice to improve environmental outcomes.

The Australian Macadamia Society noted that some macadamia farms have maintained sugarcane on their properties to avoid some approval requirements through legacy exemptions from approvals for sugarcane.

The Nature Conservation Council, NSW Farmers Association and the NSW Cane Growers Association noted that the complexity of legislation meant there was confusion over jurisdiction and (seemingly) alternative requirements from different government departments. Greater coordination and dialogue between agencies to reduce overlap and improve consistency was strongly supported.

Opportunities stakeholders identified for improvement

To address regulatory complexity, stakeholders suggested:

- simplifying assessment and approvals for clearing between floodgates and rivers
- establishing a 'one-stop shop' for information, enquiries and approvals as part of greater coordination between agencies
- establishing parameters for when maintenance can be carried out with notification, rather than application, as part of standard templates and guidelines
- providing education materials to increase awareness among landholders (particularly new landholders) of regulation and approval requirements
- providing a rolling 5-year DPI — Fisheries permit that includes extensive monitoring conditions.

Mitigating acid sulphate soils and other major environmental concerns

The peak industry groups agreed that blackwater events leading to fish and shellfish deaths are a major environmental issue. The NSW Shellfish Committee is particularly concerned that current drainage infrastructure is impacting water quality and leading to environmental and economic impacts (death of oysters). The NSW Farmers Association also noted the impact of blackwater events on the viability and economic health of aquaculture.

The issue of acid sulphate soils, while significant, was seen as better studied and managed than blackwater events, and largely a legacy issue resulting from prior practices. The NSW Cane Growers Association and the Australian Macadamia Society suggested that water quality impacts can be mitigated by best management practices implemented within their industry. However, both noted that existing acid sulphate soil mapping is broad, sometimes making it difficult to determine if development approval is required.

Some stakeholders suggested a need for improved drainage modelling and infrastructure across the floodplain to flush the system rather than have pooled water, citing siltation as a major flooding issue. The NSW Cane Growers Association suggested management approaches need to be tailored to the characteristics of the area. For example, they suggested that slow release of floodwaters in upstream areas was not a major issue, but that downstream floodwater should be able to drain quickly to prevent deoxygenation and blackwater events.

With unregulated activities by landholders seen as significantly impacting water quality, the NSW Shellfish Committee and Professional Fishers Association supported increased government enforcement.

Opportunities stakeholders identified for improvement

Stakeholders suggested:

- funding research into drainage modelling and implementation of floodplain guidelines and infrastructure to reduce blackwater events
- considering property-specific land management maps developed by the University of New England based on high-resolution satellite imagery
- increasing compliance to reduce on-farm activities that exacerbate poor water quality.

Financial implications

Lack of resources and funding were identified as major issues for government or private drainage boards improving floodplain management and infrastructure. However, some industry groups (NSW Cane Growers Association and Australian Macadamia Society) suggested that regulatory complexity was a more significant impediment to drain maintenance than lack of funding.

Some stakeholders raised issues relating to a lack of compensation. For example:

- the NSW Cane Growers Association noted a need for compensation or stipend if, as an industry, their presence in some parts of a floodplain was no longer tenable from an environmental perspective
- the NSW Shellfish Committee noted the economic and industry impacts from December 2020 and early 2021 flooding events.

Opportunities stakeholders identified for improvement

Stakeholders suggested that state government should:

- fund a buy-out of non-viable industries and support changes in industry practice for environmental protection works
- implement a risk-based cost-benefit approach to addressing infrastructure issues, directing funding and regulatory compliance to high-risk and major impact activities
- direct funding towards practical measures, such as infrastructure maintenance, rather than further studies.

Stakeholder engagement and knowledge sharing

All stakeholders appreciated the cross-agency approach to addressing the regulatory issues and the opportunity to be part of a discussion, although the NSW Cane Growers Association expressed frustration about the time it is taking to resolve the issues. The NSW Farmers Association called for ongoing engagement and dialogue, not just with state government but across all stakeholders to address differences in approach and potential conflict between upstream landholders and downstream stakeholders such as fishing/aquaculture industries.

Ongoing engagement between government, industry and the community was seen as important. Given the potentially significant social impacts of floodplain activities, gaining community support for their industry was seen as important by agricultural stakeholders. It was noted that some industries and landholders can better afford to invest in best practice and mitigate social impacts than others.

There were calls for improved consideration of sector-based knowledge and information in floodplain management and planning. Some stakeholders requested clarity on whether and how sea level rise, coastal instability and the dynamics of landscape change were being considered in formulation of policy direction.

Opportunities stakeholders identified for improvement

Stakeholders suggested that state government should:

- provide the UNSW Water Research Laboratory reports to key stakeholders
- arrange for the UNSW Water Research Laboratory to meet with key stakeholders to identify opportunities to incorporate informal and formal information into the reports
- support a forum for knowledge sharing including opportunities to share data and learnings
- coordinate centralised communication to support clear and direct information to stakeholders. For example, authorities could clearly communicate when fish deaths occur, or where work is proposed on a floodgate by a public authority so that stock can be moved.

Photo: Department of Primary Industries

2.3 Aboriginal organisations[3]

Specific concerns raised by the Tweed Byron Local Aboriginal Land Council, Tweed Aboriginal Co-op, Bundjalung of Byron Bay Aboriginal Corp and Arakwal Corporation were as follows:

- There are connected cultural stories with river flows that need to be acknowledged and protected.
- The mental health of Aboriginal people is affected by poor river health and water quality. Communities are inter-connected along rivers, within catchments and between catchments. When Country is affected, the whole community suffers.
- Landowners are building on floodplains, which comes at a cost when large rainfall events occur. The impact and voices of those landowners are heard louder than those of the environment or Aboriginal people. The cultural significance of land is not valued as high as its monetary value for development.
- The water system is already being interrupted by people. Natural and cultural aspects are being affected by what is going on now throughout the whole river system.
- Big flood events are needed to flush the system for ecological and cultural values.
- Compliance with water laws is critical. Compliance and policing are very low in this area.
- There is a general misconception that culture and environment are separate. Culture and environment are aligned.
- Aboriginal people speak (often repeatedly) with the government about their values and the significance of cultural areas, however there is little action or improvement for the community. Elders share details of important Aboriginal sites to try to stop certain developments, but more 'worth' is put on developments than the environment or Indigenous heritage.
- Consultation with Aboriginal people needs to lead to action and change.

[3] This feedback was received through non-interagency working group meetings as noted in section 2.

3 Where to next?

Suggestions made by stakeholders to address the issues are being analysed by the interagency working group. This process will include further engagement to ground-truth options and gain more local knowledge and experience on what is already working and for whom.

Additional information to guide the reforms will come from the coastal floodplain prioritisation studies being conducted by UNSW Water Research Laboratory. These studies are also being finalised after consultation with stakeholders. They provide information about the location of high-, medium-and low-risk acid sulphate and blackwater generation areas on the Tweed, Richmond, Clarence, Macleay, Hastings, Manning and Shoalhaven floodplains.

Reform options will be designed to meet several social, economic, cultural and environmental outcomes and are expected to include options to:

- change legislation or planning instruments
- change the way legislation is administered
- ensure reforms and their implications are well communicated
- address some issues through non-regulatory mechanisms.

The options will be made publicly available for comment before being finalised for the NSW Government to decide.

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