



24 May 2022

NSW Flood Inquiry

To Whom It May Concern

Byron Shire Council's submission to the NSW Flood Inquiry

Council's draft submission to the Flood Inquiry was considered at the 19 May 2022 Council Extraordinary Meeting where Council resolved (Resolution 22-134) to endorse the draft submission with amendments and submit this along with supporting information to the Flood Inquiry.

Attached is Council's submission to the NSW Flood Inquiry responding to the Inquiry's Terms of Reference and includes a pictorial story of the flood impact.

Also attached is supporting information including the meeting minutes and community submissions made to Council's Community Roundtable Meeting at which community representatives were invited to share submission concepts and material, and the results from Council's Business Survey in relation to the flood impact on businesses.

Please consider this as Council's first submission to the Inquiry and as more information and data becomes available Council may make further submissions.

Yours sincerely

Sharyn French
Manager Environmental and Economic Planning



TRADITIONAL HOME OF
THE BUNDJALUNG PEOPLE

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Submission to NSW Independent Flood Inquiry

Byron Shire Council, May 2022

Terms of Reference	Issues	Recommendations
The Inquiry is to consider and report to the Premier on the following matters:		
Causes and contributing factors 1 a. the causes of, and factors contributing to, the frequency, intensity, timing and location of floods in NSW in the 2022 catastrophic flood event, including consideration of any role of weather, climate change, and human activity	Climate change is contributing to more frequent and more severe weather Aging infrastructure Superseded standards Human activity, land clearing, deforestation, insufficient riparian zone care and maintenance Inadequate funding to keep up with ongoing maintenance of infrastructure.	The fundamental cause of climate change in generating extreme flooding and other natural disasters should be integrated in policy at every level. Revise standards and strategic planning instruments Increase Betterment Funding for future proofing Recognise the IPCC rainfall and sea level predictions
Preparation and Planning 1 b. the preparation and planning by agencies, government, other entities and the community for floods in NSW, including the accuracy and timing of weather forecasts, current laws, emergency management plans, practices and mitigation strategies, their application and effect	Recent and 2017 flooding has suggested that weather systems are acting in new ways that existing weather models do not understand and struggle to predict.	Discuss with BOM and provide guidance. Consider the need for BOM to provide different forecast products when or if there are unknowns in severe weather predictions to ensure agencies stay on high alert.
	Currently works under Part 5 (REF) processes now need to be referred to emergency agencies, but part 4 applications do not.	Consider if this requirement should be expanded to part 4 applications.
	Local flooding in last 10 years questions validity of the sizing of Annual Recurrence Intervals for rainfall volumes and intensity.	Investigate and provide advice. The 100 year flood event could be larger than we are currently predicting in Australian Rainfall and Runoff.
	A State Government Post Flood Analysis of Brunswick, Tallow and Belongil catchments is currently underway. A copy of this will be submitted to the Inquiry once finalised.	Support the review and its findings.
Response to floods	Public evacuation warnings were issued too late and multiple warnings were issued during non-waking hours – many residents were asleep and could not evacuate as the	Evacuation warnings need to be issued earlier and during waking hours.

Terms of Reference	Issues	Recommendations
<p>1 c. responses to floods, particularly measures to protect life, property and the environment, including:</p> <p>i. immediate management, including the issuing and response to public warnings;</p> <p>ii. resourcing, coordination and deployment, including with respect to the Australian Defence Force; and</p> <p>iii. equipment and communication systems</p>	<p>town had already been cut off and homes impacted. The first flood peak was 6.30am.</p>	
	<p>Public evacuation warnings issued by SES directed residents to an evacuation centre that was not operational. This resulted in extreme confusion and distress for residents as well as the informal, ad-hoc operation of the site.</p>	<p>SES needs to confirm that evacuation centre is operational, prior to issuing evacuation directives to residents.</p>
	<p>Evacuation centre at Mullumbimby Ex-Services Club was not operational because DCJ staff failed to arrive on site before the town was cut off and did not seek alternative access (e.g. police escort by boat).</p> <p>The site's Manager and 1 staff member catered to the needs of 300+ residents who had been forced to evacuate locally, with issues including:</p> <ul style="list-style-type: none"> - No registration process, therefore no subsequent support available - No covid safety processes, therefore significant covid risk - No supply of bedding/blankets/dry clothes etc. - Limited supply of food/water - Inadequate safe access to the evacuation centre - No support for people with significant support needs, e.g. disability, covid-positive, significant distress, etc. - The centre itself was threatened with flooding 	<p>DCJ staff take precautionary approach to schedule arrival on site prior to flood impact/isolation of community. Alternatively, DCJ staff receive priority marine escort to evacuation centre in situations where site has been cut off.</p> <p>Preference that DCJ staff live locally.</p> <p>Identify an alternate or new evacuation centre, as the Mullumbimby Ex-Services Club is unsuitable in a flood.</p>
	<p>Extensive advocacy and escalation was needed before DCJ staff arrived 48 hours into the flood impact. However, the vast majority of centre attendees had already left due to the poor conditions and lack of resourcing and support.</p> <p>Anecdotal information indicates that many of these residents returned home to flood impacted properties (without an SES confirmation it was safe to return), despite the risks and discomfort, as it was preferable to their</p>	<p>Increased DCJ evacuation centre staffing surge capacity and meaningful collaboration with local communities to ensure safety of residents at operational evacuation centres.</p> <p>DCJ staff be empowered to be more flexible to respond during a disaster.</p>

Terms of Reference	Issues	Recommendations
	<p>experience at the informal evacuation centre. Many were across the road at the Mullumbimby District Neighbourhood Centre and Civic Hall. DCJ staff refused to move their operations across the road despite being invited.</p> <p>DCJ staff then sought to close the site as soon as possible rather than establish effective communications regarding its operational status.</p>	<p>Local area community wardens be identified and trained be empowered to make decisions when other communications fail.</p>
	<p>During emergency events a number of agencies are acting in separation and only combined via the Local Emergency Management Committee (LEMC). This then relies on one person to disseminate information to each agency staff. In large events it is not possible for agency staff to stay up to date with warning, evacuations and more. Further lead agencies were not always in attendance at LEMC / EOC.</p>	<p>Investigate the appropriateness of an agency-wide solution such as the EMCOP used in Victoria or other solutions that allow improved and timely information sharing.</p> <p>Investigate a model such as that used by RFS in NSW to pull in state and local government employees to a separate command structure in an emergency. Ongoing training be funded by the State Government for this purpose.</p>
	<p>The deployment of ADF teams was slow, cumbersome and committed later than desired.</p>	<p>Early commitment of ADF teams to support responsible agencies should be investigated and pre agreed methods (including templates) developed to ensure methods of obtaining teams is known pre-event.</p>
	<p>Coordination of ADF operations in local communities was deeply problematic.</p> <p>The volume of needs on the ground made escalation through the LEMC prohibitively unwieldy. An online form was trialled (where members of the public could log support requests), however acceptance of the work, indicative timeframes and work completion was not reported back to residents or local organisations. This led to confusion, duplication and inefficiencies.</p> <p>To mitigate coordination inefficiencies, ADF personnel commenced working directly with local organisations, outside formal processes. This was effective in part, however it was challenging for ADF personnel to have a</p>	<p>Clear task coordination processes, supporting documentation and training developed and implemented in local communities.</p> <p>Clear communications between organisations about how to get assistance.</p>

Terms of Reference	Issues	Recommendations
	<p>clear source of truth, critically assess or prioritise requests in the chaotic post-impact context.</p> <p>Community were not aware how they could access assistance from the ADF. The ADF were apparently told not to assist unless asked.</p>	
	<p>Council staffing for emergency event preparedness is currently at the choice of Councils and dependent on capacity and funding.</p>	<p>State or Federal funding should be provided, along with a level of direction to ensure Council have staff dedicated to ensuring systems and processes are maintained and available at all times ready for events. This includes staff training in the use of the systems.</p>
	<p>Despite Council being proactive in this space community still have limited awareness around agency roles and how to access information.</p>	<p>Wider state level education and the EMCOP noted above could help improve this scenario.</p>
	<p>Flood sirens were investigated as part of a recent Floodplain Management Plan but were not supported.</p>	<p>Consider the support of sirens as a future response mechanism to support current messaging systems.</p>
	<p>Internal communications in hinterland areas or when landline or mobile networks fail.</p>	<p>Could Council's access the emergency services radio communications network rather than needing to develop its own radio network.</p>
	<p>Wide-scale communications failure exponentially compounds the challenges of responding to flood impacts. For example, Mullumbimby township had no phone communication, no internet (and therefore no EFTPOS available for people to purchase food/water during temporary period of water insecurity) for approximately 1 week following the flood impact.</p>	<p>Identification of local or broader approach to back up communications infrastructure.</p>
	<p>Immediately after the flood Council were struggling to obtain specialist geotechnical advice to open roads impacted by landslips. Most consultant engineers were isolated from Council due to highways being flooded. A number of government organisations had geotechnical engineers driving around or flying in helicopters looking at landslips on private land. Despite requests via LEMC none</p>	<p>Various opportunities to investigate:</p> <ul style="list-style-type: none"> • Flood proof highway access • Require government organisations to support Council for urgent inspections and create a process to request the support via LEMC.

Terms of Reference	Issues	Recommendations
	would help Council and this prevented roads being opened to community but also emergency services.	<ul style="list-style-type: none"> • Provide Council with access to helicopters to fly our own specialists to the shire.
	<p>No mobile coverage or internet access available at the evacuation centre due to damaged network.</p> <p>Phone was busy with worried relatives looking for people. No line clear for emergency communications.</p> <p>Issue - During the second flood no information was available during the event, even though other non-government sites had it.</p>	BOM is supported so that it can have up to date information
	SES had inadequate volunteers to perform the necessary rescues.	SES be supported to recruit more volunteers and work more closely with other organizations to make up for the shortfall.
	SES communications were incorrect telling people to access Mullumbimby Evacuation Centre via the Pacific Highway, effectively directing people into flood water.	Ensure local knowledge is included that is safe and correct
	One of the reasons DCJ said they could not get to the evacuation centre was the road access available was via Saddle Rd and Saddle Rd is gravel in parts and they are not insured to travel on gravel roads during weather events.	Funding be made available for road maintenance or upgrades to ensure emergency access is safe and available.
<p>Transition from incident response to recovery</p> <p>1 d. the transition from incident response to recovery, including the roles, structure and procedures of agencies, government, other entities and the community</p>	<p>Transition from response to recovery was unclear and not communicated well between/within agencies e.g. SES. This led to ineffective communication with communities about how to progress requests for support.</p> <p>Agencies were in different modes at the same time. Tweed/Byron EOC remained active for a period of time after Lismore EOC had already moved to Recovery. SES moved to Recovery for both EOC s causing confusion.</p> <p>Some communities were still in incident response phase, yet formal recovery stage commenced (e.g. isolated hinterland communities).</p>	<p>Clearer communication processes within and between agencies, with implications of transition to recovery stage well understood by each agency.</p> <p>Agencies are represented at EOC until officially closed and officially Recovery stage reached. Improved training to EOC representatives for role clarity during declared events or activation.</p>

Terms of Reference	Issues	Recommendations
	<p>Inadequate human resourcing surge capacity in agencies responsible for recovery phase, e.g. Resilience NSW, local councils, particularly in a wide-scale, catastrophic event.</p> <p>Local councils have a significant role in recovery and additional human resourcing is needed instantly. However, in order to claim expenses under the DRFA, councils need to either recruit external people or redeploy and backfill staff – this doesn't align with operational time demands.</p> <p>Mobile phone and internet service outages were widespread and over an extended period. Emergency messaging with impacted residents was very limited.</p>	<p>Establish state-wide pool of upskilled staff from areas of state government operations that do not experience frontline impacts, and can be deployed, during large scale disaster events.</p> <p>Request telecommunication carriers build more resilient networks and have surge capacity in repair technicians. The major NBN outage for the region could have been avoided if multiple network paths were available for internet access rather than a single connection point at Woodburn.</p> <p>Consider funding to have portable satellite-based communications services on standby, stationed at community hubs like local halls. These could be used for immediate support in the operations of emergency response centres or other emergency work hubs. Equipment examples include satellite phones and satellite internet services such as Starlink.</p>
<p>Recovery from floods</p> <p>1 e. recovery from floods, including:</p> <ul style="list-style-type: none"> i. immediate housing, clean-up, financial support and community engagement measures; and ii. longer-term community rebuilding support 	<p>Immediate housing options completely inadequate</p> <p>Housing options lacking for community members experiencing homelessness prior to the flood, despite their dwellings being impacted.</p> <p>Clean up of residents' homes led by community members/spontaneous volunteers, therefore wide-spread risk issues, including health and safety, asbestos management, insurance/legal requirements and trauma awareness.</p> <p>Applications for financial support slow to receive approval – many still waiting on outcome of applications.</p>	<p>Scenario planning for surge housing capacity utilising diverse sites and good practice processes.</p> <p>Increased Temporary Accommodation surge capacity through DCJ processes.</p> <p>Inclusion of people experiencing prior homelessness in all housing responses.</p> <p>Resourced coordination of spontaneous volunteers.</p> <p>Process improvement.</p>

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	<p>Not enough rated flood gauges. Byron has two SES flood-rated gauges and this is not enough.</p>	<p>SES need to partner with Council to rate all flood gauges to ensure community can understand what water levels mean at each gauge. Funding will be needed to support this action to happen.</p>
	<p>Staff education on disaster funding sources, systems, methods and what is fundable, etc.</p> <p>(Additionally for businesses) Funding support information and dissemination delayed due to internet and phone issues.</p> <p>Too much documentation required for some business grant applications and requirement for businesses to pay for certain goods and services then request reimbursement via business grant once over certain amount of grant request not feasible for many businesses- lack of cashflow and difficulty accessing documentation for various reasons; phone and internet connectivity, lack of ID, overwhelm etc</p> <p>Lack of financial support options for workplace visa holders</p>	<p>Council's should receive a level of education annually to refresh current staff and educate new staff.</p> <p>Reduce red tape and proof of upfront documentation, improve phone and internet connectivity.</p> <p>Consider financial support options for workplace visa holders</p>
	<p>Flood waste collection:</p> <p>Lack of timely direction from EPA on management of hazardous waste such as asbestos amongst other flood debris</p> <p>Lack of landfill sites within the region capable of accepting volumes of asbestos</p>	<p>Planning for emergency management of asbestos at EPA level with clear guidance and assistance for local Councils on how to handle this amongst large volumes of flood waste on the kerb</p> <p>Future sites and landfill cells approved for this purpose</p> <p>Temporary waste transfer sites identified and pre-approved for the purpose of quick and efficient waste removal from flood affected properties</p>

Terms of Reference	Issues	Recommendations
	<p>Local waste transfer station overwhelmed with the volume of waste in the initial week, and forced to close to the general public</p> <p>Disposal of recoverable materials as waste resulting in much more waste going to landfill than is necessary</p> <p>Community led groups wanting to help with no real mechanism for this to occur</p> <p>Timely advice as to whether “building waste” would be covered under Natural disaster funding arrangements</p> <p>Clarity and clear communication between ADF and Council during clean up phase – multiple points of contact and no follow up</p> <p>Service NSW portal – residents advised to apply for assistance for ADF and other support in cleaning up their properties and businesses and no follow up / closure. After several weeks request referred to Council after which Contractors had finished clean up efforts.</p> <p>Clean up of creek systems and private properties whereby landslips have occurred or debris washed from other areas onto private land</p>	<p>Communications and education to be developed on the type of material that can be salvaged, keeping whitegoods, hazardous materials and salvageable materials separate. Funding and focus for resource recovery programs at the kerbside</p> <p>Community groups empowered to salvage and repair goods and materials for return to owner or those in need with financial support to do so and / or to assist</p> <p>Clarity at State level on definition and funding for building and demolition from properties affected by natural disaster</p> <p>Scope of what ADF can assist with and how including available resources with direct communication to the manager of the clean up team to avoid multi agency cross over and a more coordinated approach</p> <p>A fit for purpose disaster response team created within the ADF.</p> <p>Better management of the portal if this is the mechanism to be used</p> <p>Program developed and replicated to deal with this type of waste and situation. Recognition that creek and other waterways will be affected as well as navigable rivers</p>

Terms of Reference	Issues	Recommendations
	<p>ADF offering support in the form of people power only, in situations where plant and equipment was far more efficient</p> <p>Public Works engaged Contractors failure to deliver on clean up tasks and communicate resulting in distressed residents and increased workload for Council staff</p> <p>Lack of early recovery phase advice at state level in clean up</p> <p>Competition for Contractors and freight both across internal departments and across neighbouring Councils.</p> <p>Highway blockages resulting in inability for any waste to be transported to a licensed landfill</p>	<p>Greater understanding and appropriate resourcing to assist in the clean up.</p> <p>Pre existing contracts for emergency waste management with clear Contract KPIs and expectations to be delivered.</p> <p>Service NSW / Public Works single point of contact as soon as soon as recovery phase commences to provide advice with oversight of plan at regional level</p> <p>Improved regional coordination of resources</p>
<p>Any other matters</p> <p>1 f. any other matters that the inquiry deems appropriate in relation to floods</p>	<p>The recently announced betterment fund is great way of planning to be more resilient to the next disaster event.</p>	<p>This should not be a one off and ideally form part of the disaster funding processes already in place. This ensures moving forward we can rebuild with suitable assets rather keep rebuilding assets that risk failure in future events.</p>
	<p>Many people lost their cars in the flood, or abandoned cars on roads seeking higher ground to avoid flood damage.</p>	
<p>And to make recommendations arising from the Inquiry as considered appropriate, including on:</p>	<p>Audit of assets that have been repaired numerous times, due to repeated flood or landslip damage.</p>	<p>Consider the need to complete audits post event to highlight repeat asset repairs and highlight assets that require betterment.</p>
<p>2 a. safety of all emergency service personnel and community first responders</p>	<p>Community first responders participated in activities with high levels of risk to both physical and psychological safety, including hiking into dynamic, isolated disaster-impacted</p>	<p>Funding for training and resourcing community first responders.</p>

Terms of Reference	Issues	Recommendations
	<p>areas, rescuing residents, obtaining/storing/distributing supplies including fuels, etc.</p> <p>In one instance, community first responders located a deceased person during operations to a disaster-impacted area.</p> <p>First responders also took an active role in early stage cleanup e.g. demolishing flood-impacted housing elements (walls/flooring/kitchens, etc), which carried significant risk involving health and safety, asbestos management, insurance/legal requirements and trauma awareness.</p>	
2 b. preparation and planning for future flood threats and risks	<p>Lack of first responder/spontaneous volunteering coordination and support by a trusted local organisation.</p> <p>Local organisations that previously oversaw spontaneous volunteering were defunded (cessation of community hub funding) in June 2021 and this systemic gap significantly increases risk associated with spontaneous volunteering during an event.</p>	<p>Reinstatement of community hub funding, or similar, to local organisations for the purposes of spontaneous volunteer coordination.</p> <p>Reestablishment of spontaneous volunteering processes in community.</p> <p>Establish a team of community volunteers that have some basic training and appropriate insurance</p>
	<p>Funding for infrastructure, community resilience and planning</p>	<p>Resilience not only reduces long term costs and damage in future events it also reduces the impacts to community during future events. Recommend increased dedicated funding for the upgrade of infrastructure to more resilient infrastructure at any time. It should not only happen post disaster, if justified. Funding should be 100% to ensure it is not reliant upon Council funding ability.</p> <p>Support establishment of community lead resilience networks</p>
	<p>Insurance costs/insurability of properties – impact on property owners unable to secure flood insurance</p>	<p>Insurance Industry practices and support to property owners</p>

Terms of Reference	Issues	Recommendations
2 c. use of flood gauges and other warning structures and/or strategies for improved flood prediction	Separate, adequate funding for the maintenance and upgrade of flood warning systems built, maintained and funded by Council continues to be difficult against all of Councils funding needs and desires.	Appropriate and dedicated annual state funding in two streams; maintenance and upgrade for warning systems is desired. Upgrade would also allow for improving accuracy of warning models and the installation of cameras which the community could view at road crossings etc. As requested in inquiry public meetings.
2 d. impact on essential services, including electricity supply, water supply and telecommunications	Council funds and provides a permanent team of labour and associated plant to maintain the drainage and related flood and storm water shire-wide infrastructure and provide ongoing monthly performance reports	Support from state government
2 e. land use planning and management and building standards, including: i. the instruments, policies and programs applying to existing development in flood prone locations across NSW; and ii. the instruments, policies and programs applying to proposed future developments in flood prone locations across NSW	<p>The Standard Instrument—Principal Local Environmental Plan (SI LEP) governs land use zoning for all councils in NSW. Currently the SI LEP does not contain a single hazard zone. This year’s catastrophic flooding in the Northern Rivers region created significant land slips across the Byron Shire rural hinterland, with certain areas still inaccessible (by road) and potentially uninhabitable in the future. It is important that the inquiry TORs include a review of the need to introduce one or more appropriate hazard zones in the SI LEP, so that such areas are clearly off-limits to incompatible land uses in the future.</p> <p>The new mandatory ‘flood planning’ clause inserted into all council LEPs (in July 2021) applies to land within the “<i>flood planning area</i>”, which in Byron Shire captures land affected by the 1:100yr ARI event with allowance for projected climate change to the year 2100. In light of this year’s catastrophic flooding in the Northern Rivers region, it is important that the inquiry TORs include a review of minimum flood planning standards for those areas most severely impacted (eg. Lismore, Mullumbimby, Ballina). This should form part of a broader review of the NSW Government’s Flood Prone Land Policy, as set out in the NSW Floodplain Development Manual.</p>	<p>That the TORs include a review of the need to introduce one or more appropriate hazard zones in the SI LEP, so that such areas potentially/physically affected by landslip are clearly off-limits to incompatible land uses in the future.</p> <p>State to coordinate and undertake necessary risk assessments of land affected by landslip and prepare hazard overlay mapping (eg. Coded red - acquisition, amber, green)</p> <p>Building height limits may need to be reviewed to allow flood proofing of existing properties</p> <p>State driven building standards required for flood compatibility and servicing</p> <p>That the TORs include a review of minimum flood planning standards for areas most severely impacted by catastrophic flooding in Northern Rivers Region; AND that this form part of a broader review of the NSW Government’s Flood Prone Land Policy, as set out in the NSW Floodplain Development Manual Investigate more proactive awareness or declaration of natural hazard constraints on property during purchase/change of land owner</p>

Terms of Reference	Issues	Recommendations
		Flood Planning Levels based on risk assessment of catchments
2 f. appropriate action to adapt to future flood risks to communities and ecosystems	<p>Community-centred adaptation and resilience requires a collaborative, ongoing community development approach, yet this is not well-resourced.</p> <p>The cost burden of establishing ongoing Disaster Resilience Officers falls to individual councils and can be prohibitive, as post-event recovery roles are funded for 2 years only.</p> <p>Buildings that are not adaptable</p>	<p>Fund Resilience Officers, and associated operational resourcing, for all NSW Councils to ensure a community-centred approach to resilience.</p> <p>Adequate planning and budgeting for adaptation and betterment.</p> <p>Consider a mechanism to not allow concrete slab construction in the floodplain and other design considerations that are not adaptable.</p> <p>Improved active management of waterways required to minimise blockages and maintain healthy banks</p>
2 g. coordination and collaboration between the NSW Government and the Australian Government	Lack of clarity about state/federal agency roles (e.g. Resilience NSW as compared to the NRRR) and duplication of local presence.	Clarification and communication to local councils about scope of work, alignment and differentiation between ResNSW and NRRR.
	<p>Federal outreach service delivery (Services Australia mobile bus) was too rigid to integrate with other outreach support or respond to community need.</p> <p>The Services Australia bus had mandated locations and times that were issued by federal staff under Ministerial direction, who were unwilling to coordinate or align with state-based services or locally planned outreach. This created confusion and inefficiency for local communities, disrupted attempts to enable a 'one-stop shop' and was not person-centred.</p>	Collaboration between Federal and State services in response to local community need.

Terms of Reference	Issues	Recommendations
2 h. coordination and collaboration by the NSW Government with other state and territory governments and local governments	Lack of consistency and clear communication from Res NSW regarding planning and implementation of Recovery Centre and outreach planning.	Increased Res NSW surge capacity to enable consistency of personnel deployment to impacted areas.
	Voluntary House Raising and Purchase scheme are very hard for Council to fund and make happen. The expenditure also doesn't save Council money in the future, it saves government and insurers money and protects communities' wellbeing and houses.	A new funding model is urgently needed to 100% fund Voluntary House Purchase schemes and provide 50% of funds to land owners towards the costs of Voluntary House Raising.
2 i. public communication and advice systems and strategies	Refer to comments on this in responses above	

February 2022 Flood Event



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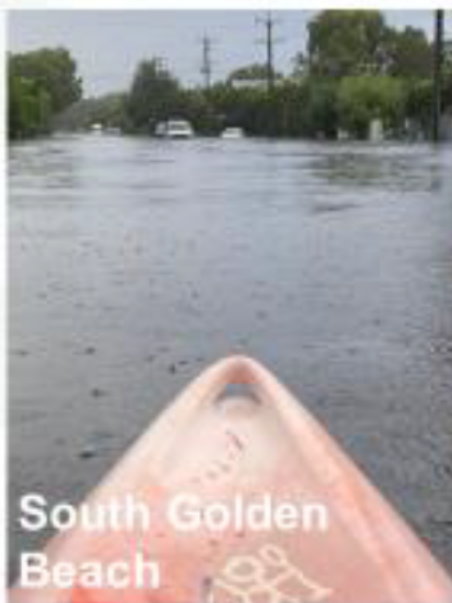
Hinterland communities



BYRON
SHIRE
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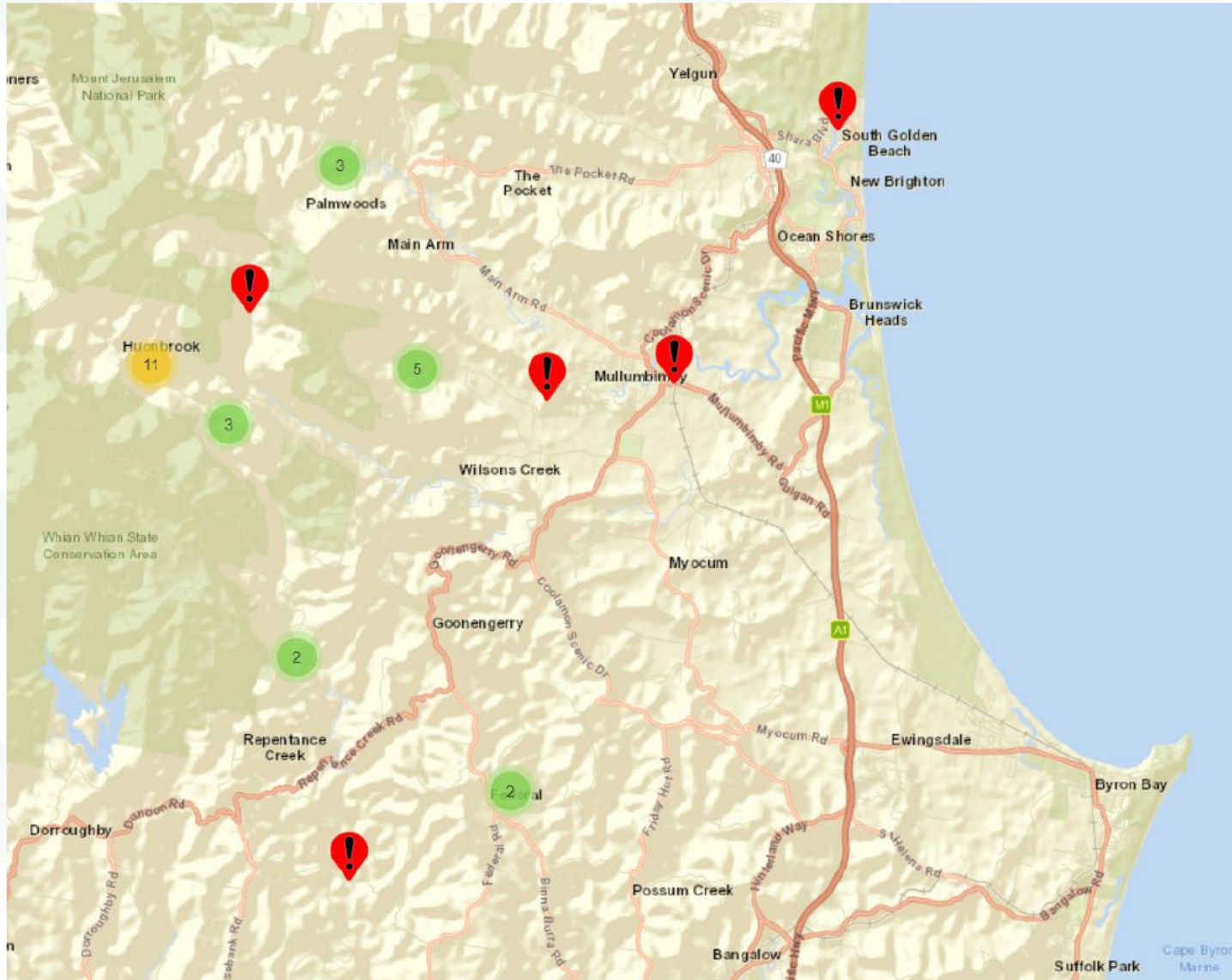
Coastal communities



Damage Map



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Huonbrook / Wanganui



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Main Arm / Upper Main Arm



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SHIRE
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Palmwoods



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Wilsons Creek / Upper Wilsons Creek



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Upper Coopers Creek



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Mullumbimby & surrounds



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long-term options for flood impacted communities being considered

- build back better**
- build different**
- build elsewhere**
- build with infrastructure and services to support the above options – proportionate to community need and available funding**

Survey for Flood Impacted Businesses: Key Findings

April to May 2022



Summary

To better understand the implications of recent flood events on businesses and various industry sectors in Byron Shire, Council conducted a survey from Thursday 7 April to Weds 4 May 2022.

62 responses from local businesses were received during the survey period, from a variety of industry sectors including accommodation and food services, manufacturing, arts and recreation services and retail.

This survey follows a walk-around to over 100 flood impacted businesses by Council's Business Support team. The Business Support team provided business support information and grant assistance that was available at the time.

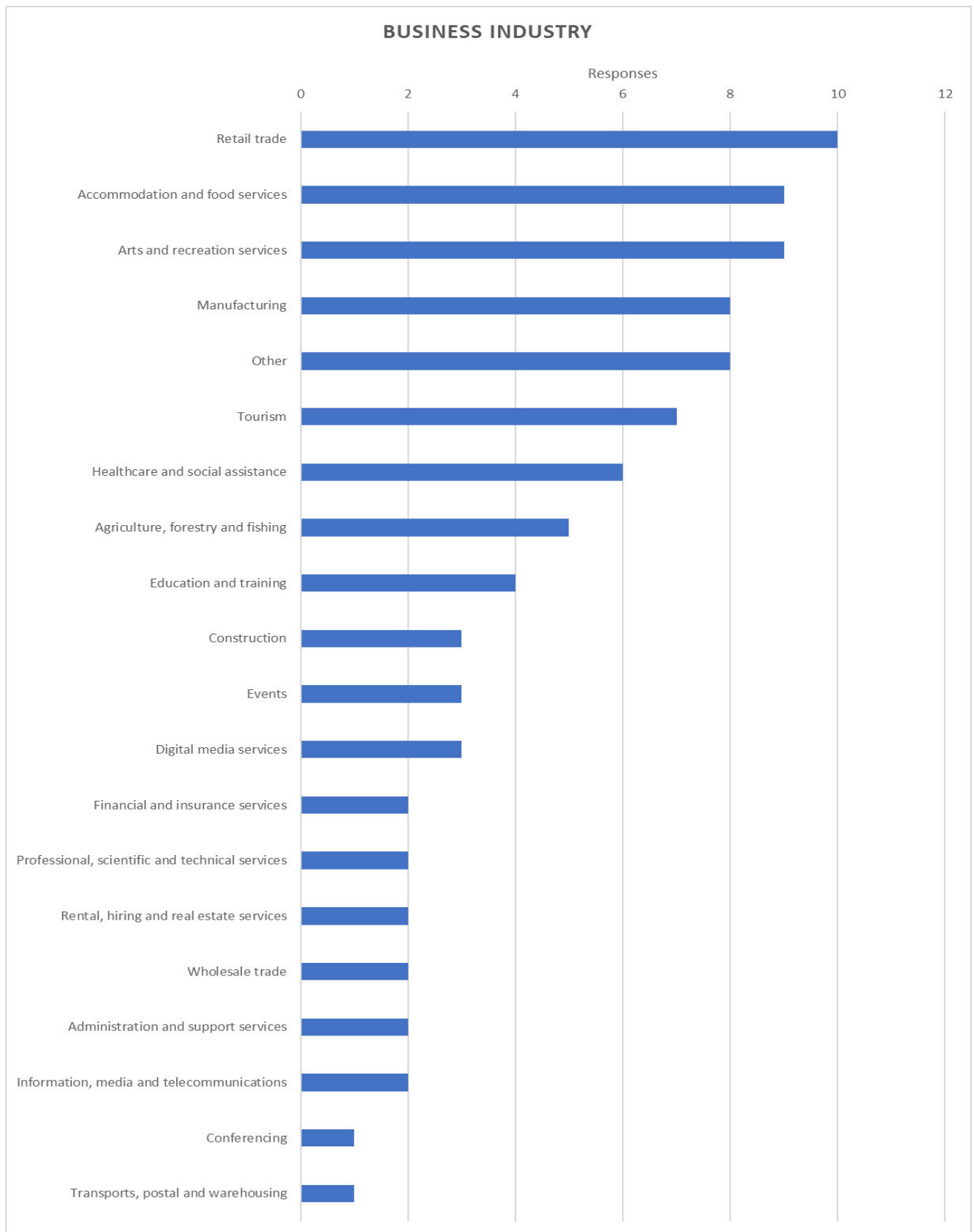
Overall, the survey indicated businesses were directly and/or indirectly impacted by recent weather events. Some businesses were considering permanently closing or relocating and some were considering pivoting their business to remain sustainable.

For many, it is cost prohibitive to take out flood insurance for future operations. New or renovated premises are required right now by some, access to government assistance and grants most useful, and attracting new clients is a key medium to long term business need.

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Has your business suffered direct damage from recent flood events?	8
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Estimated value of business equipment replacement	10
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Estimated loss of revenue.....	12
Has your business suffered indirect damage?	13
Please specify the indirect damage to your business that you have experienced.....	14
What stage of recovery are you at?	15
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Business Industry



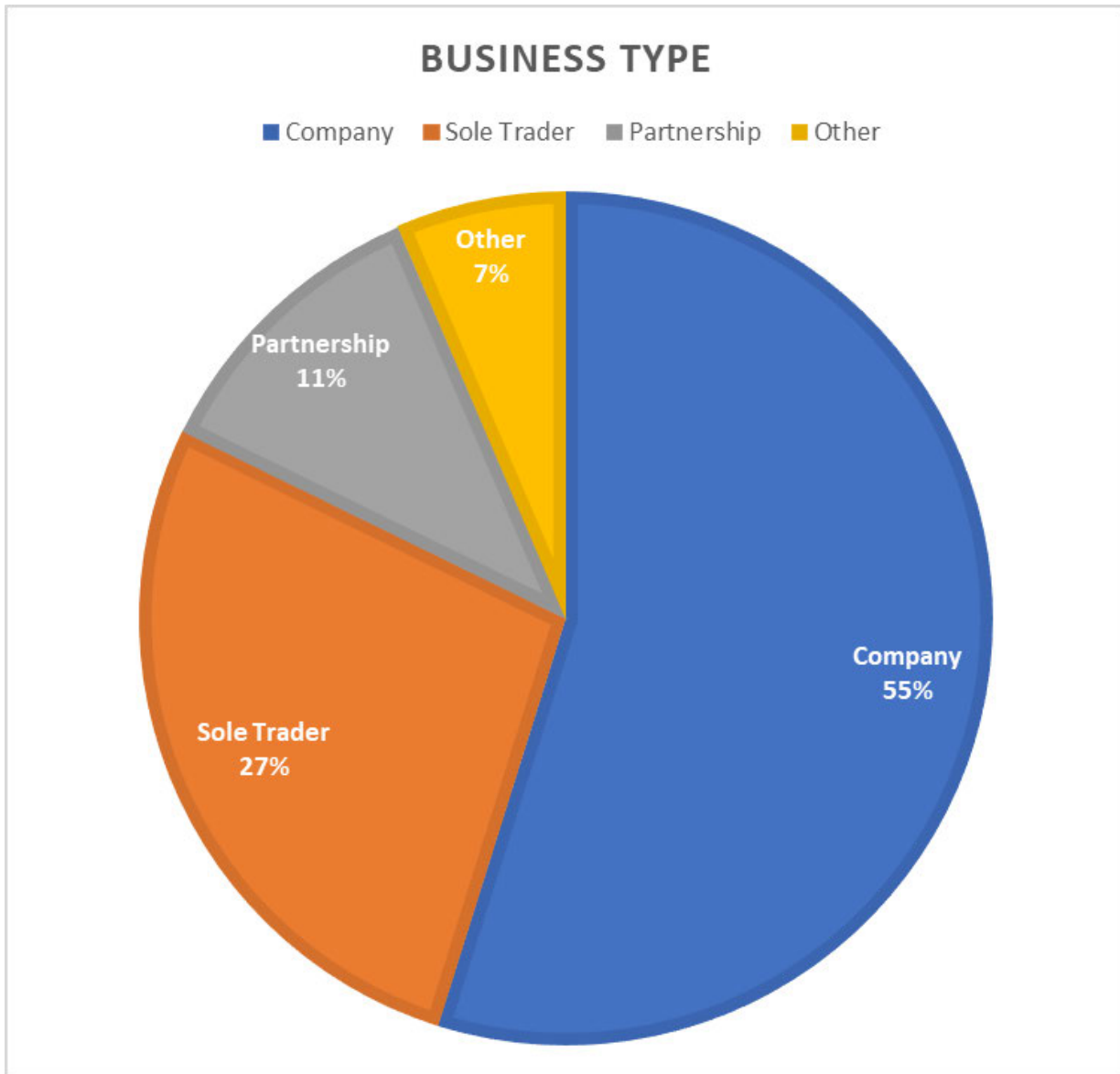
Responses

- Retail trade- 10
- Accommodation and food services- 9
- Arts and recreation services- 9
- Manufacturing- 8
- Other- 8
- Tourism- 7
- Healthcare and social assistance- 6
- Agriculture, forestry, and fishing- 5
- Education and training- 4
- Construction- 3
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- Digital media services- 3
- Financial and insurance services- 2
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- Rental, hiring and real estate services- 2
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- Conferencing- 1
- Transports, postal and warehousing- 1

Summary

Respondents could select more than one industry sector for their business. A variety of industry sectors responded to the survey. The top 3 industry sectors that responded to the survey are retail trade, arts and recreation services and accommodation services.

Business Type



Responses

- Company- 34
- Sole Trader- 17
- Partnership- 7
- Other- 4

Summary

34 of the 62 respondents run a company, 17 are sole traders and 7 are in a partnership. 4 specified that their businesses are classed as 'other' and 4 of the 62 respondents stated that their businesses are also home-based.

How many employees pre and post flood event?

	Full time employees	Part time employees	Casual employees
Pre-Flood Event	123	88	225
Post Flood Event	116	90	168
Reduction/ Increase	Reduction of 7	Increase of 2	Reduction of 57

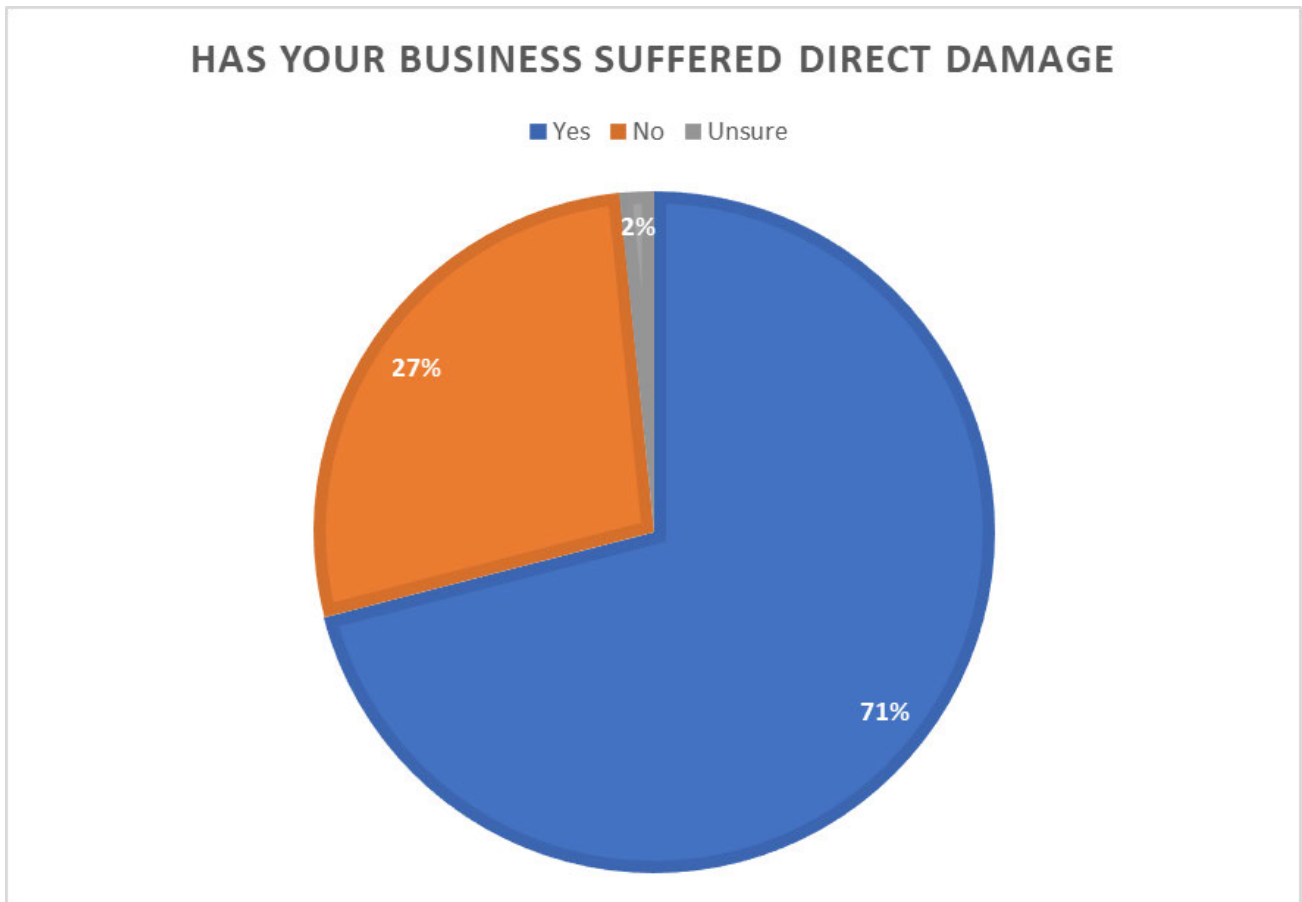
Summary

41 of the 62 businesses said their employee count remained the same.

There was a reduction of 7 full time, and 57 casual employees post flood event, and an increase in 2 part time positions.

The most significant reduction in employee numbers were in the tourism, accommodation and food services and arts and recreation services industries.

Has your business suffered direct damage from recent flood events?



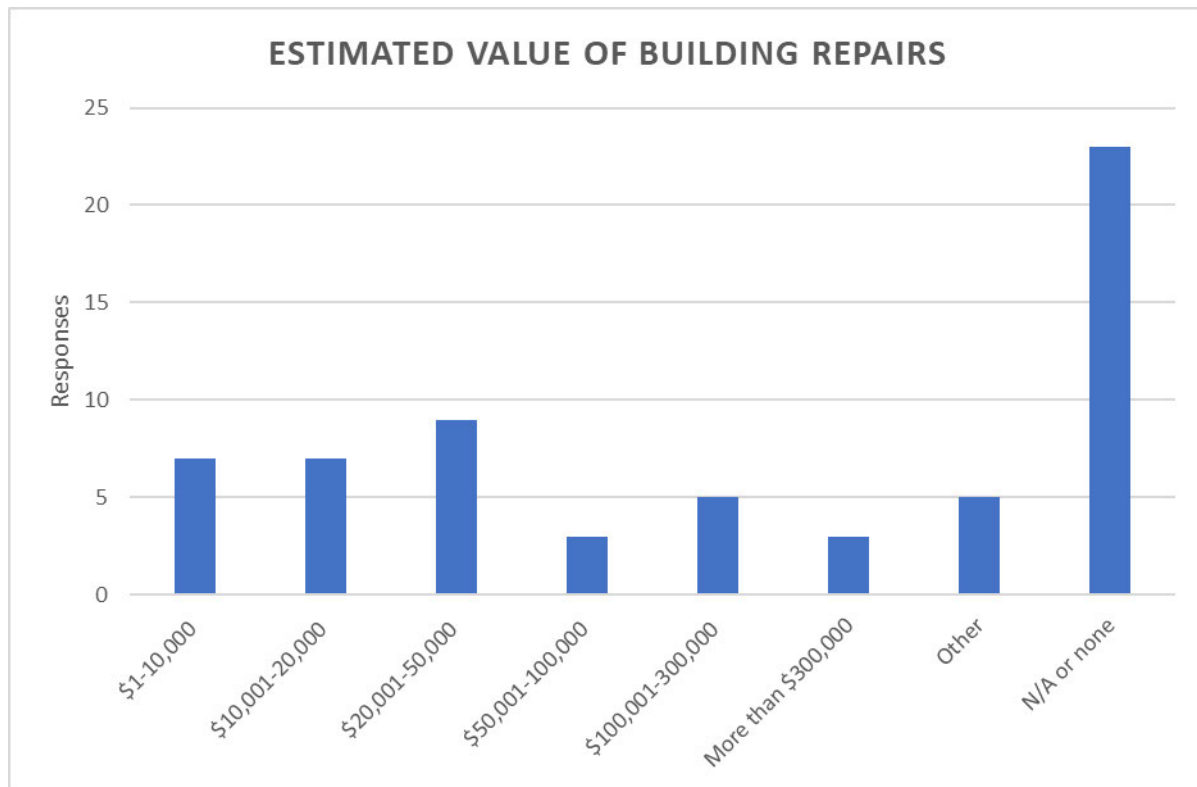
Responses

- Yes- 44
- No- 17
- Unsure- 1

Summary

44 of the 62 respondents said their business suffered direct damage from recent flood events, 17 said they were not indirectly impacted, and one business was unsure of any indirect impacts.

Estimated value of building repairs



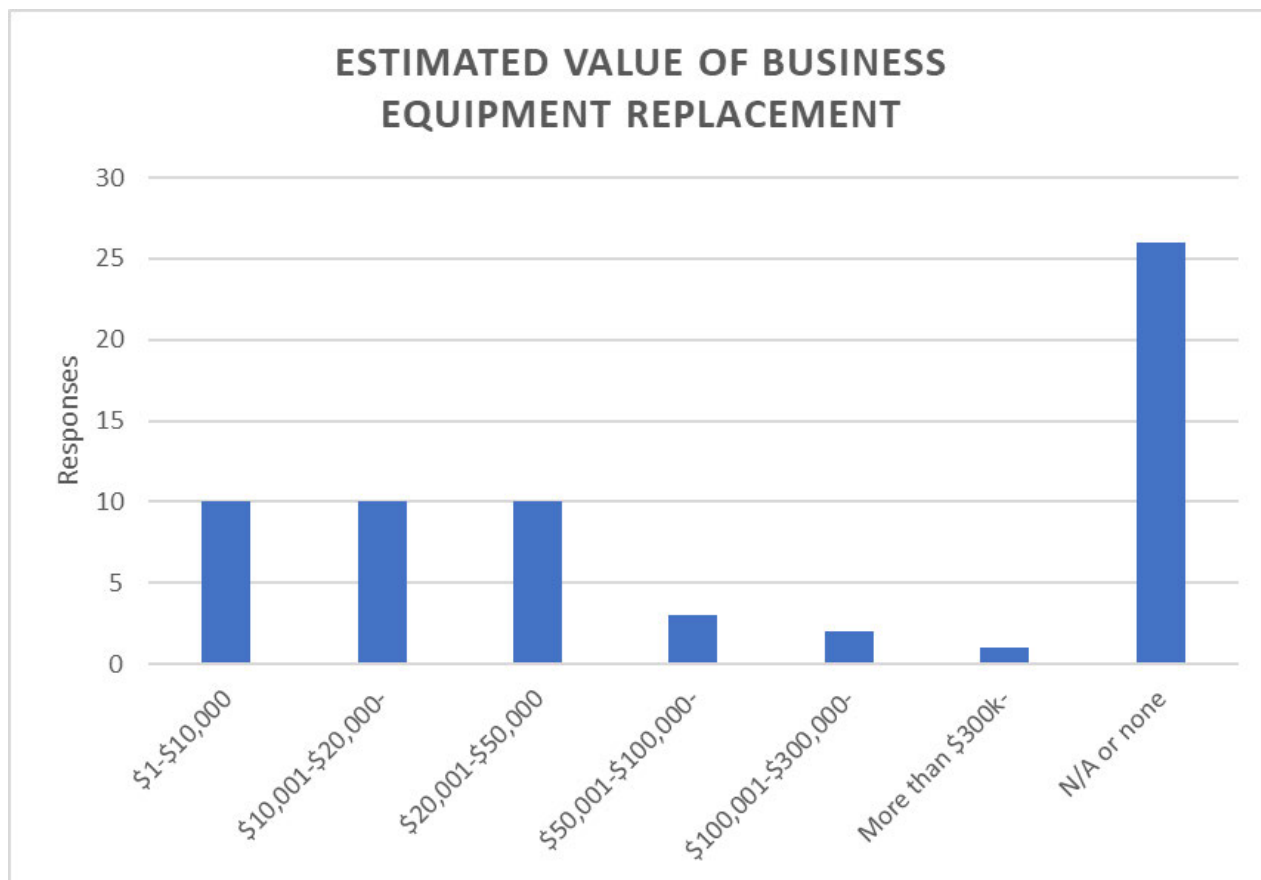
Responses

- \$1-\$10,000- 7
- \$10,001-\$20,000- 7
- \$20,001-\$50,000- 9
- \$50,001-\$100,000- 3
- \$100,001-\$300,000- 5
- More than \$300,000- 3
- Other- 5
- N/A or none- 23

Summary

The estimated value of building repairs varied from \$0 to \$750,000, with 9 respondents identifying they had \$20,001-\$50,000 value in building repairs.

Estimated value of business equipment replacement



Responses

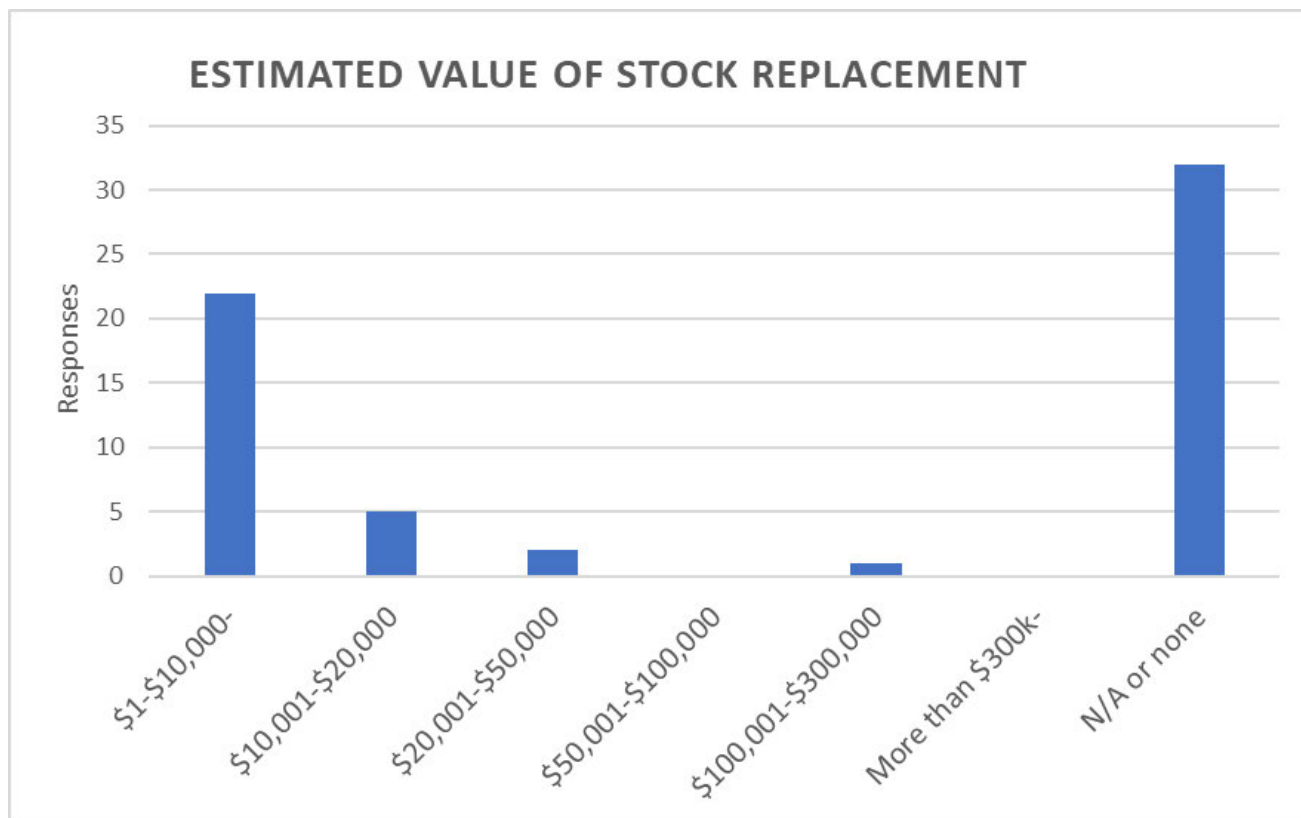
- \$1-\$10,000- 10
- \$10,001-\$20,000- 10
- \$20,001-\$50,000- 10
- \$50,001-\$100,000- 3
- \$100,001-\$300,000- 2
- More than \$300k- 1
- N/A or none- 26

Summary

The estimated value of business equipment replacement varied from \$0 to \$350,000.

10 respondents said they estimate up to \$10,000 in business equipment replacement, 10 said up to \$20,000 estimated value and another 10 respondents estimated up to \$50,000 in business equipment replacement.

Estimated value of stock replacement



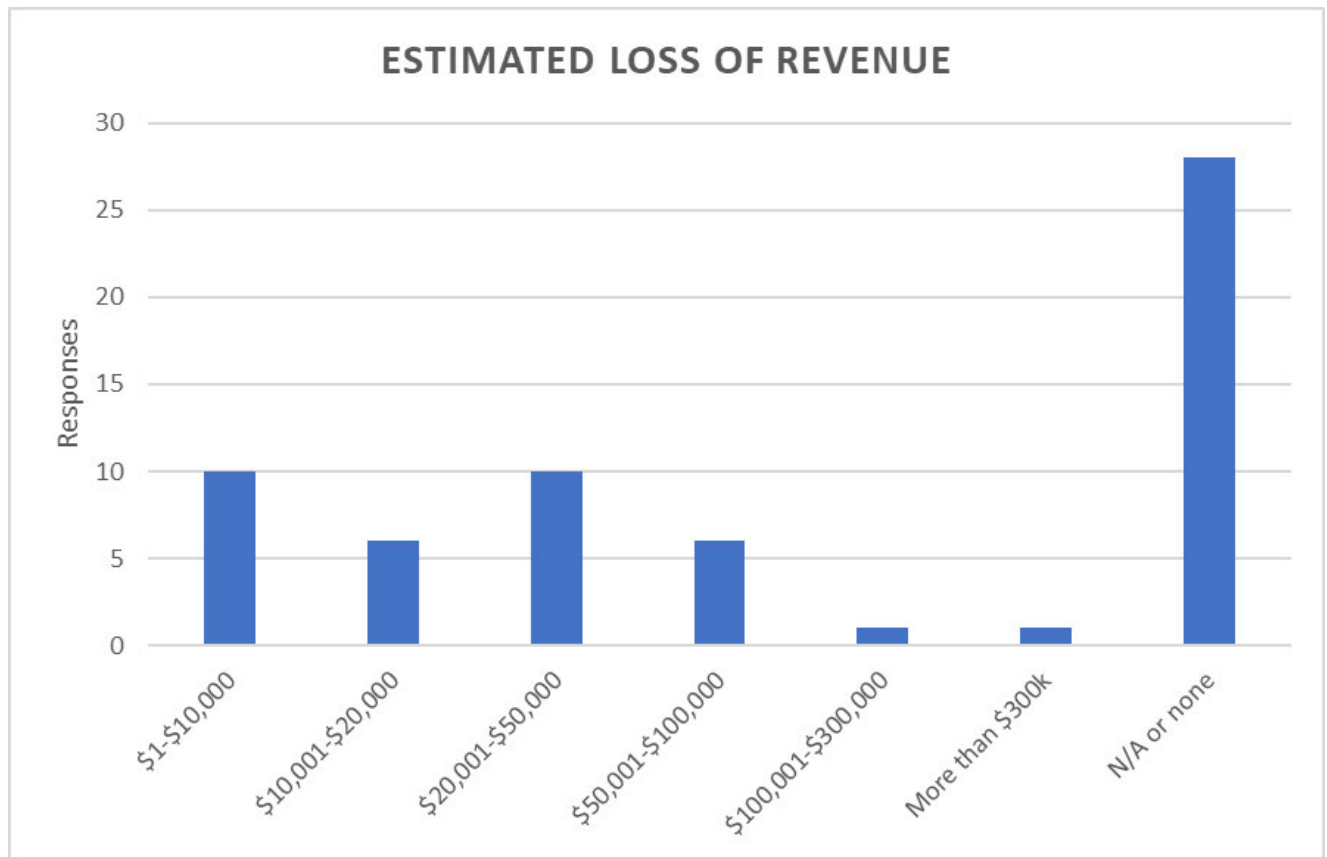
Responses

- \$1-\$10,000- 22
- \$10,001-\$20,000- 5
- \$20,001-\$50,000- 2
- \$50,001-\$100,000- 0
- \$100,001-\$300,000- 1
- More than \$300k- 0
- N/A or none- 32

Summary

22 of the 62 respondents said their estimated value for replacing stock was \$10,000 or less. 1 respondent estimated value of stock replacement at \$100,000 to \$300,000 whereas 32 respondents did not respond or indicated no stock replacement required.

Estimated loss of revenue



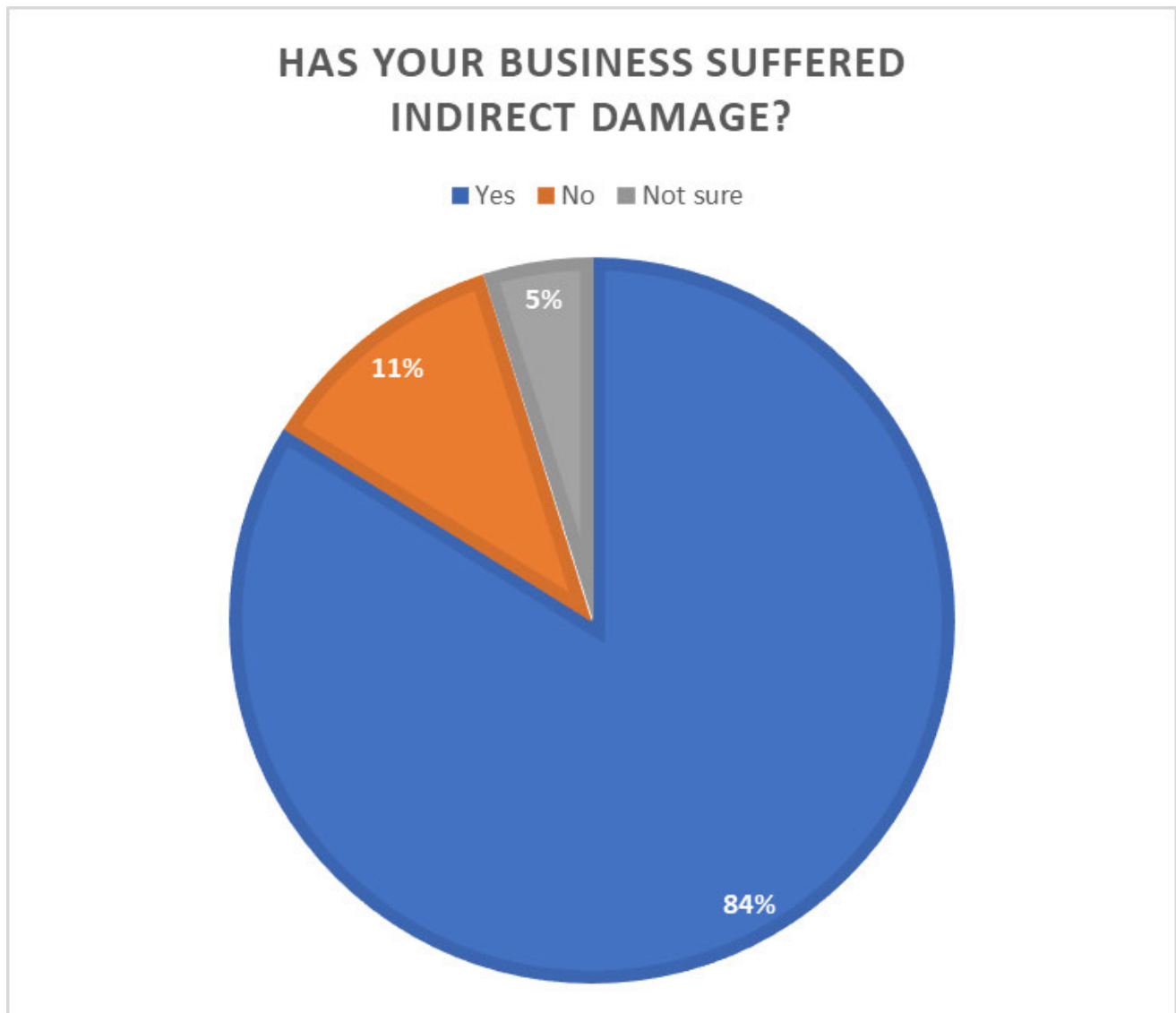
Responses

- \$1-\$10,000- 10
- \$10,001-\$20,000- 6
- \$20,001-\$50,000- 10
- \$50,001-\$100,000- 6
- \$100,001-\$300,000- 1
- More than \$300k- 1
- N/A or none- 28

Summary

10 of the 62 respondents estimated loss of revenue as \$10,000 or less, 10 respondents estimated loss of revenue at \$20,001-\$50,000 and 28 respondents did not indicate an estimate or there was no loss of revenue.

Has your business suffered indirect damage?



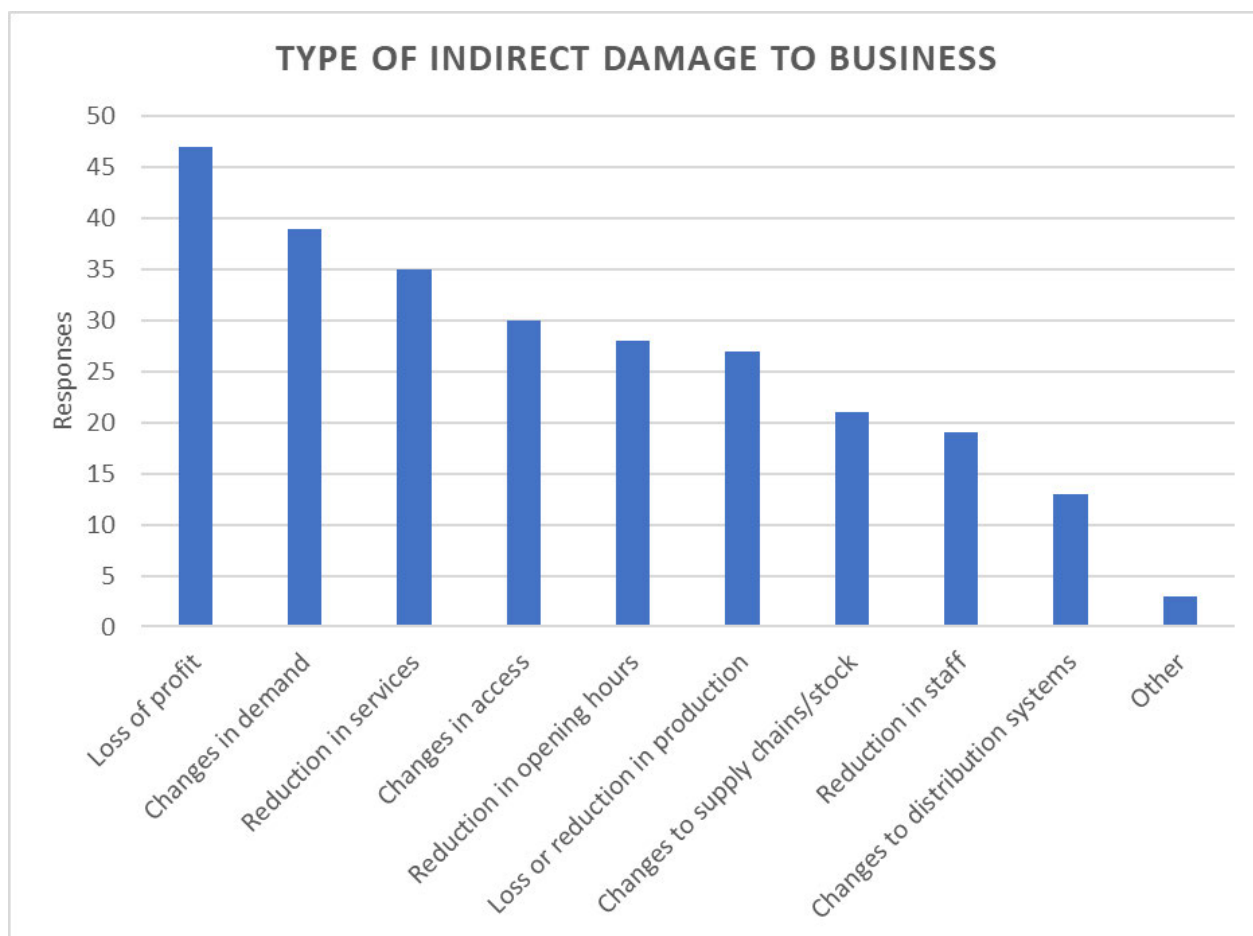
Responses

- Yes- 52
- No- 7
- Not sure- 3

Summary

The majority of respondents reported their business suffered indirect damage from recent flood events.

Please specify the indirect damage to your business that you have experienced.



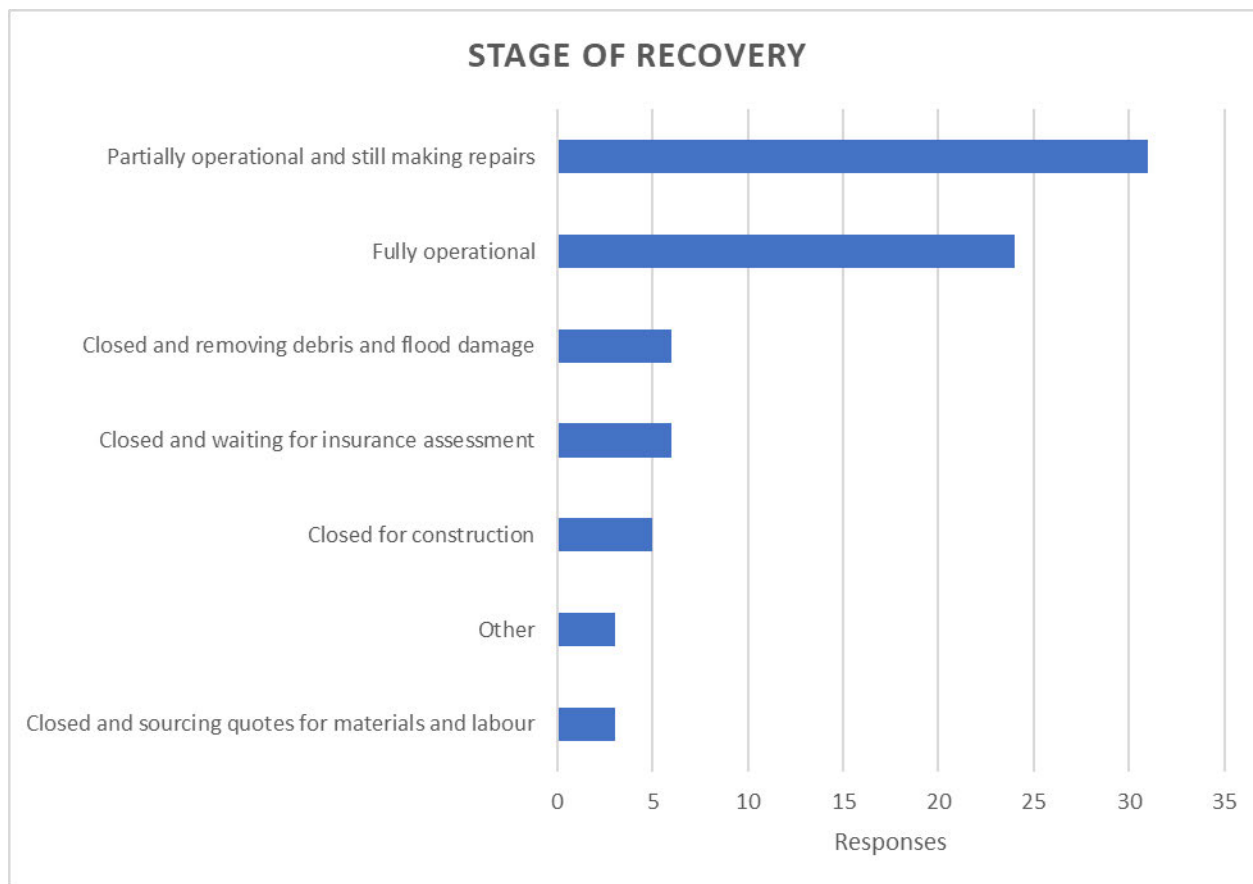
Responses

- Loss of profit- 47
- Changes in demand- 39
- Reduction in services- 35
- Changes in access-30
- Reduction in opening hours- 28
- Loss or reduction in production- 27
- Changes to supply chains/stock- 21
- Reduction in staff- 19
- Changes to distribution systems- 13
- Other- 3

Summary

Respondents could specify more than one type of indirect damage to their business. The top 3 responses were loss of profit, changes in demands and reduction in services.

What stage of recovery are you at?



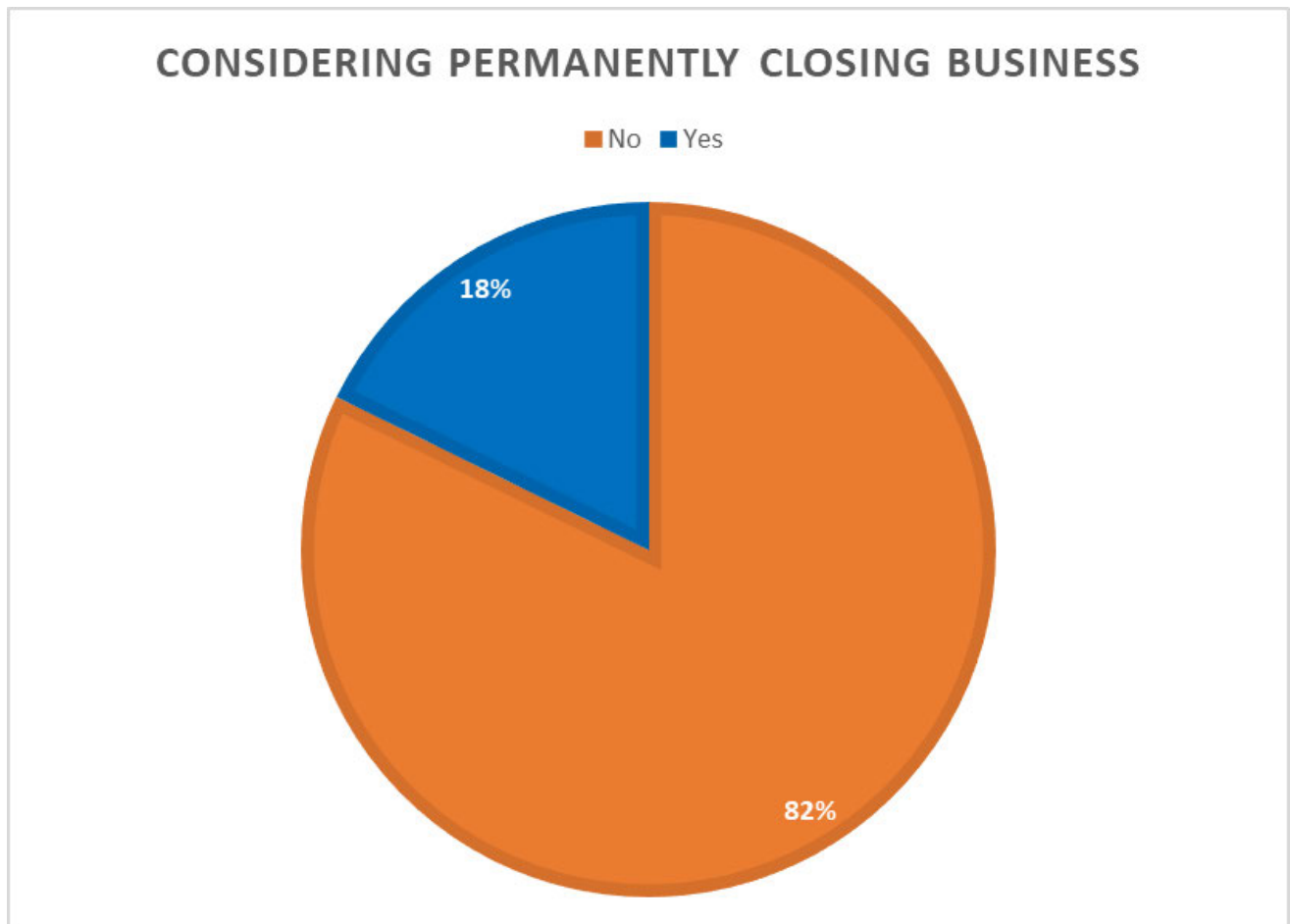
Responses

- Partially operational and still making repairs- 31
- Fully operational- 24
- Closed and waiting for insurance assessment- 6
- Closed and removing debris and flood damage- 6
- Closed for construction- 5
- Closed and sourcing quotes for materials and labour- 3
- Other- 3

Summary

Respondents could choose more than one response. 31 businesses said they are partially operational and still making repairs and 24 businesses are fully operational.

Are you considering permanently closing your business?



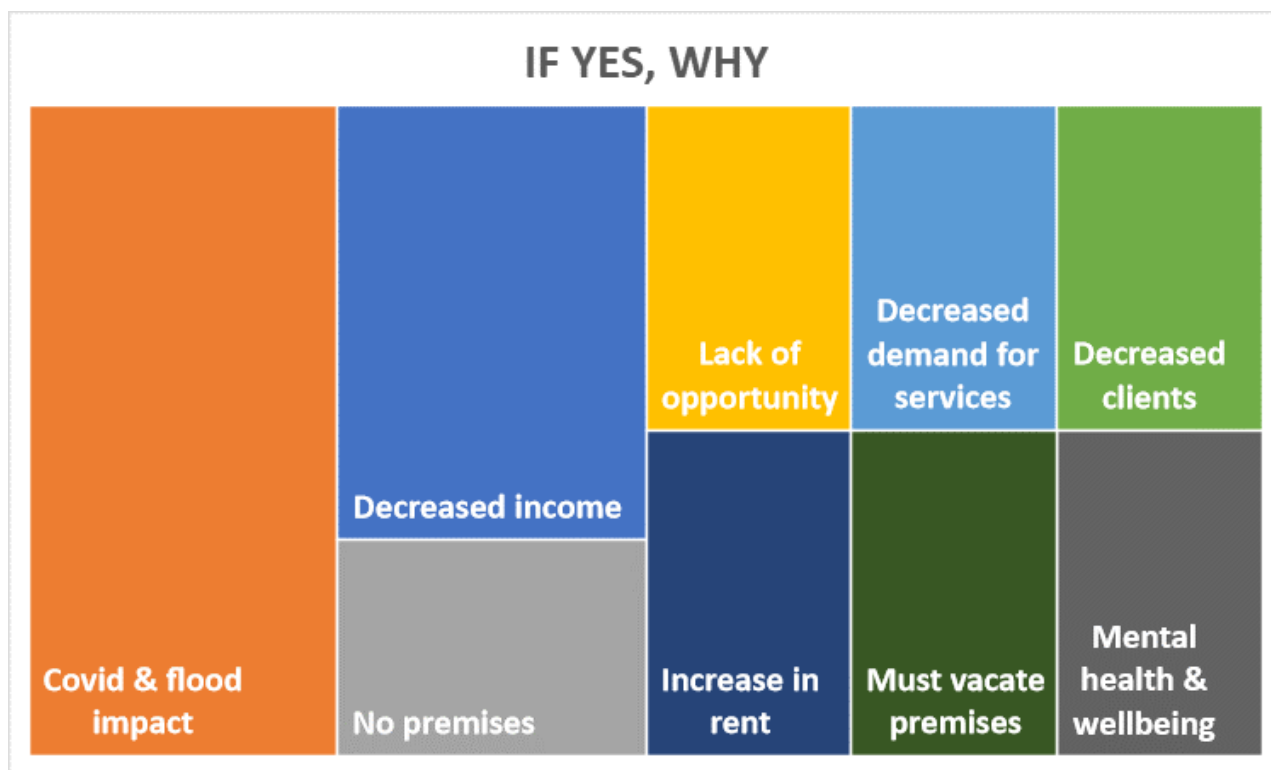
Responses

- No- 51
- Yes- 11

Summary

11 of the 62 respondents are considering permanently closing their business.

If yes, please tell us why in particular



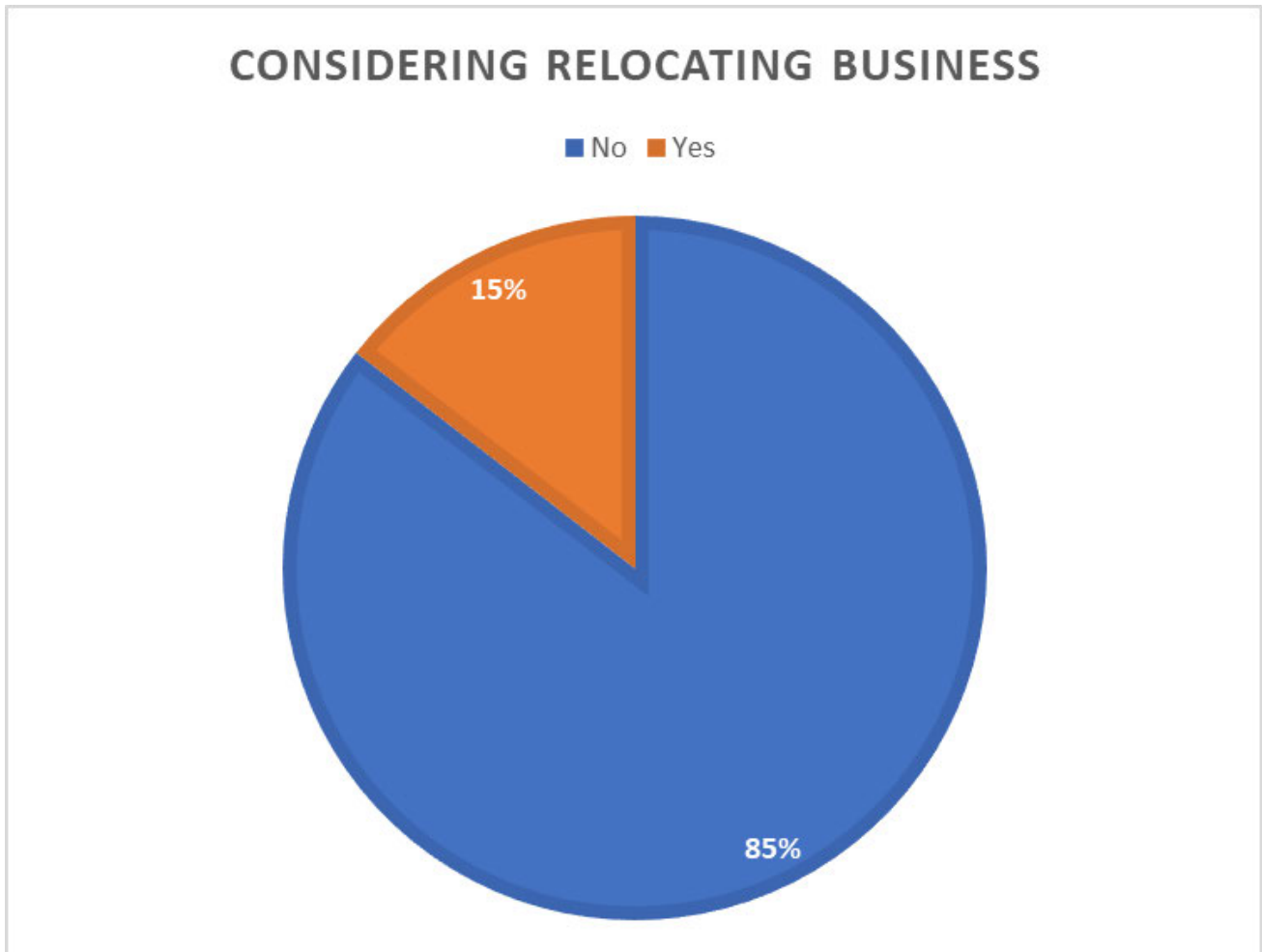
Responses

- Covid & flood impact- 3
- Decreased income- 2
- No premises- 1
- Lack of opportunity- 1
- Decreased demand for services- 1
- Decreased clients- 1
- Increase in rent- 1
- Must vacate premises- 1
- Mental health & wellbeing- 1

Summary

COVID-19 and flood events have impacted local businesses. Loss of income, decrease in clients and demand for services, lack of premises, lack of opportunity, increase in rent and mental health and wellbeing were indicated as reasons for considering closing business.

Are you considering relocating your business?



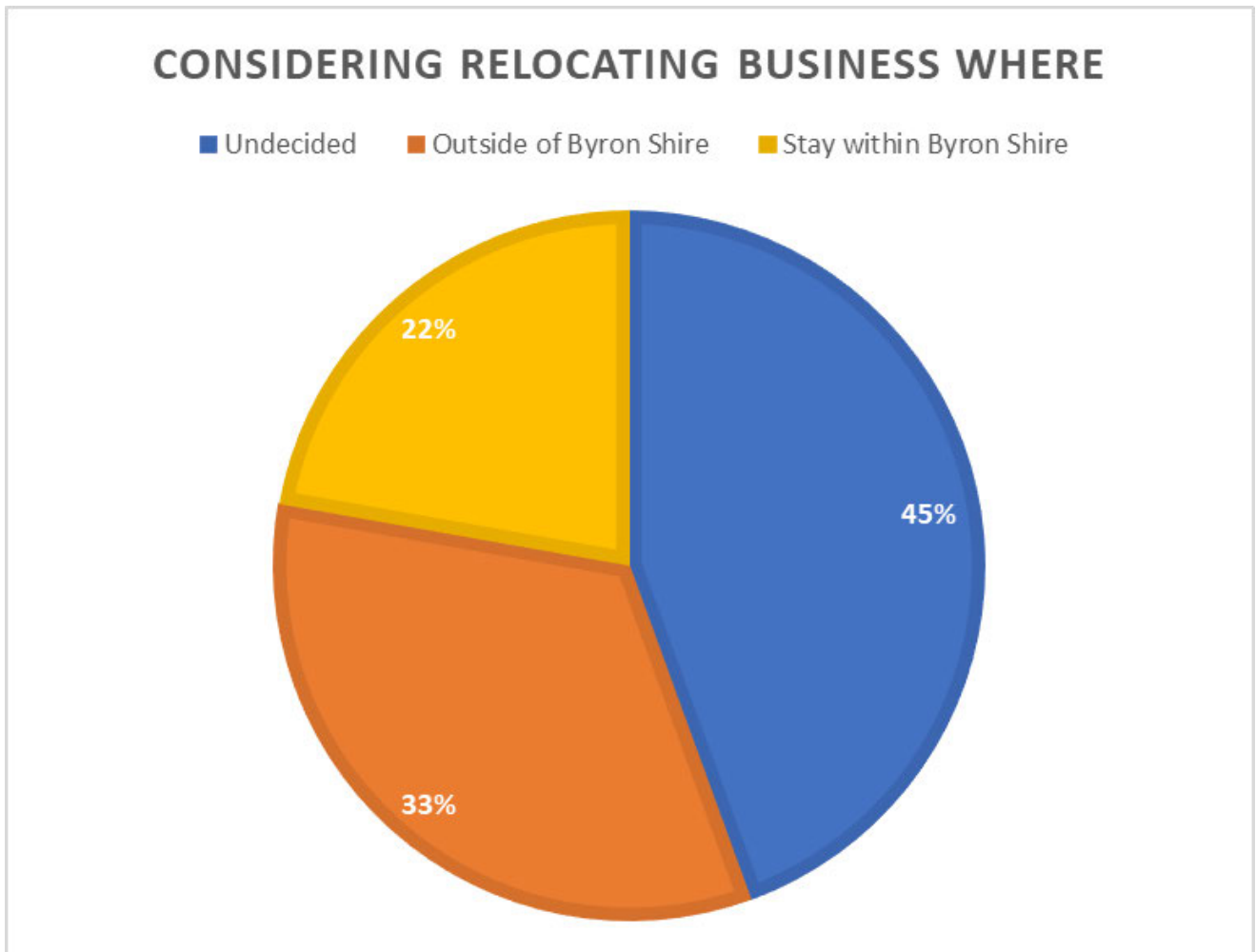
Responses

- No- 53
- Yes- 9

Summary

9 of the 62 respondents are considering relocating their business.

Please indicate where you are considering relocating your business.



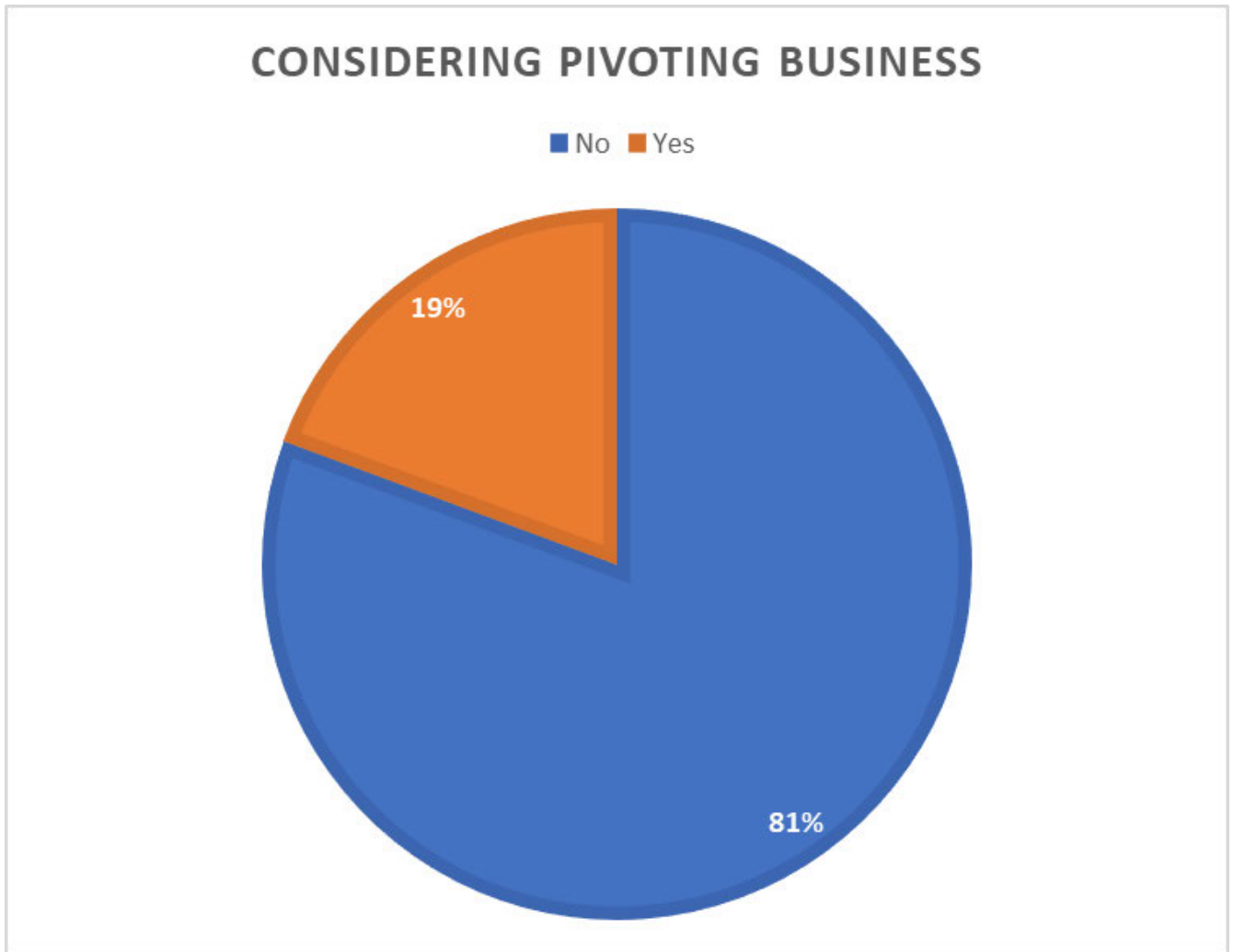
Responses

- Undecided- 4
- Outside of Byron Shire- 3
- Stay within Byron Shire- 2

Summary

3 of the 9 respondents considering relocating their business to outside of Byron Shire, 2 are considering staying within the Shire and 4 are undecided.

Are you considering pivoting your business?



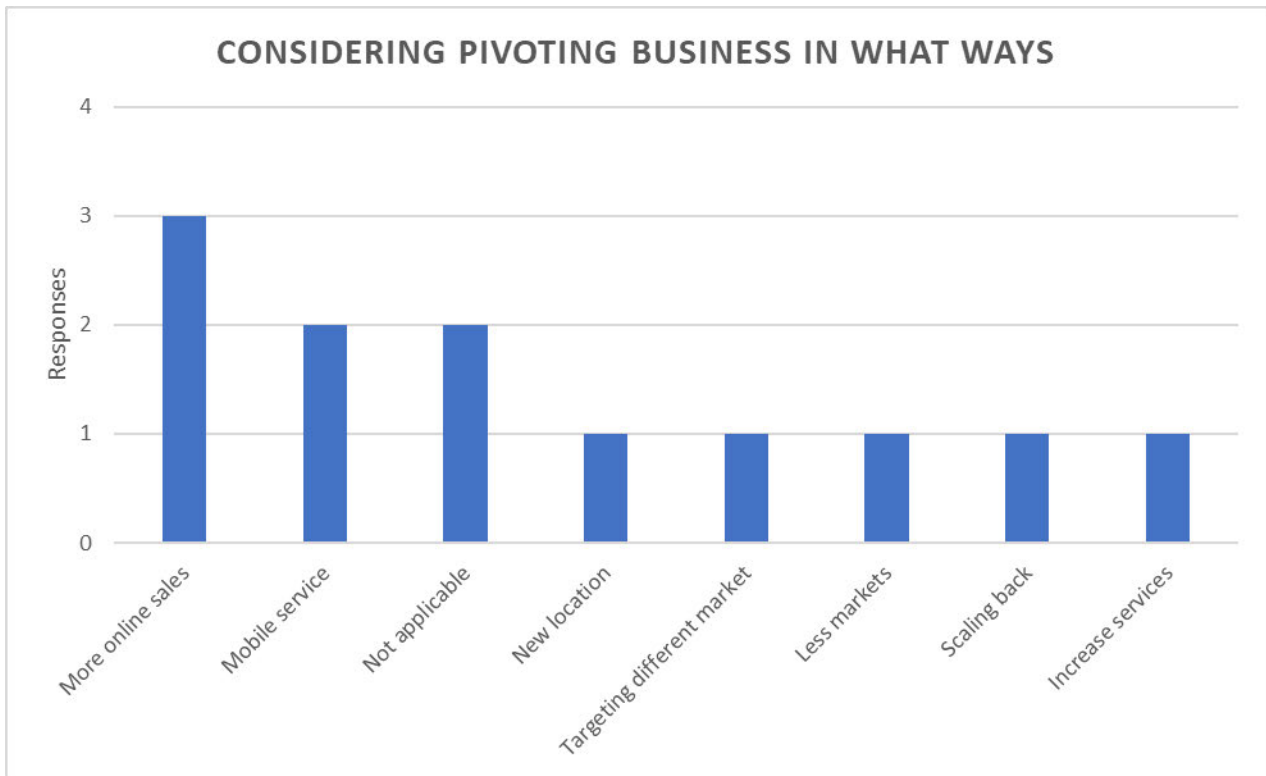
Responses

- No- 50
- Yes- 12

Summary

12 of the 62 respondents are considering pivoting their business.

In what ways are you considering pivoting your business?



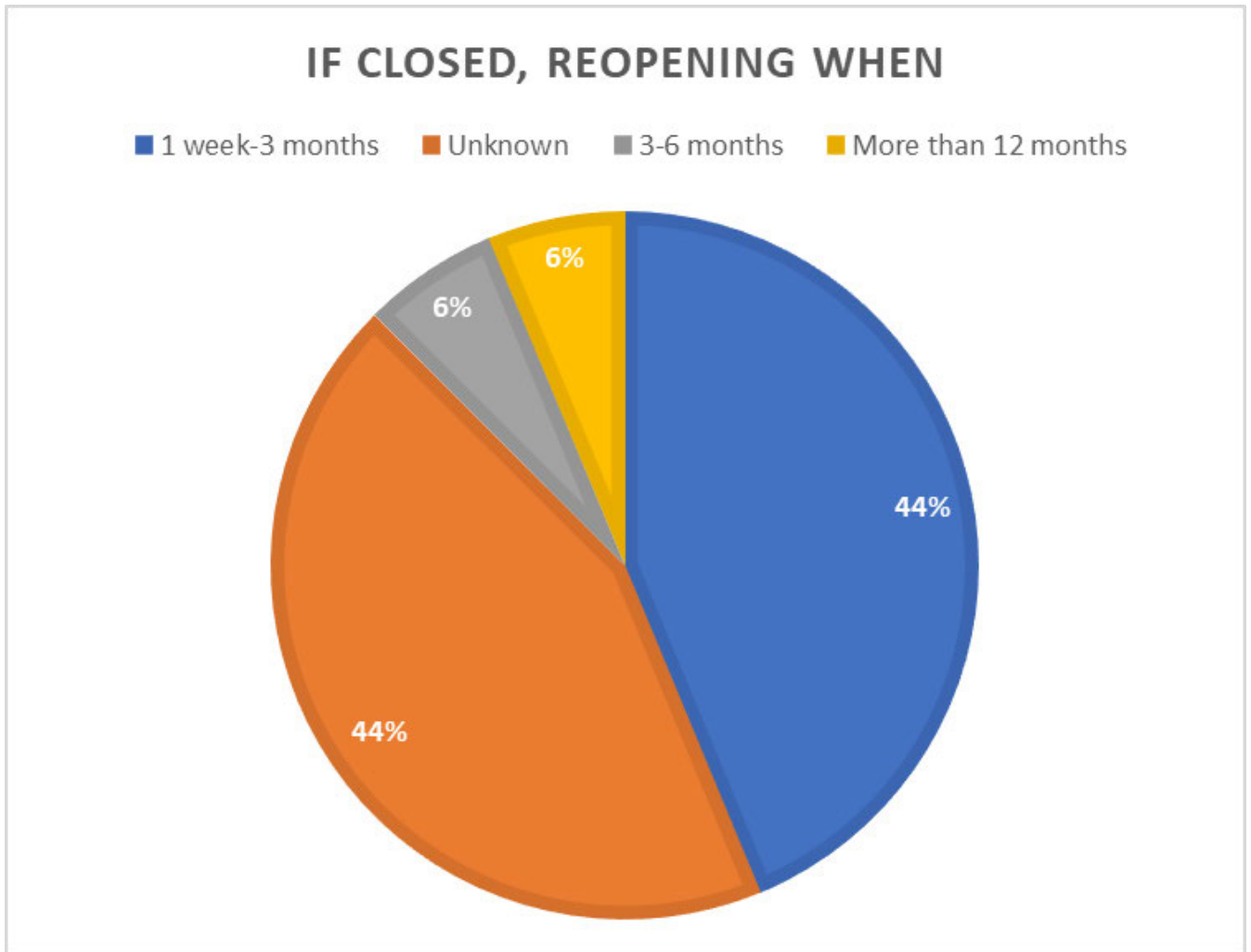
Responses

- More online sales- 3
- Mobile service- 2
- Not applicable- 2
- New location- 1
- Targeting different market- 1
- Less markets - 1
- Scaling back- 1
- Increase services- 1

Summary

3 businesses are considering increasing online sales and 2 are considering pivoting to provide a mobile service.

If you are closed, when do you estimate reopening?



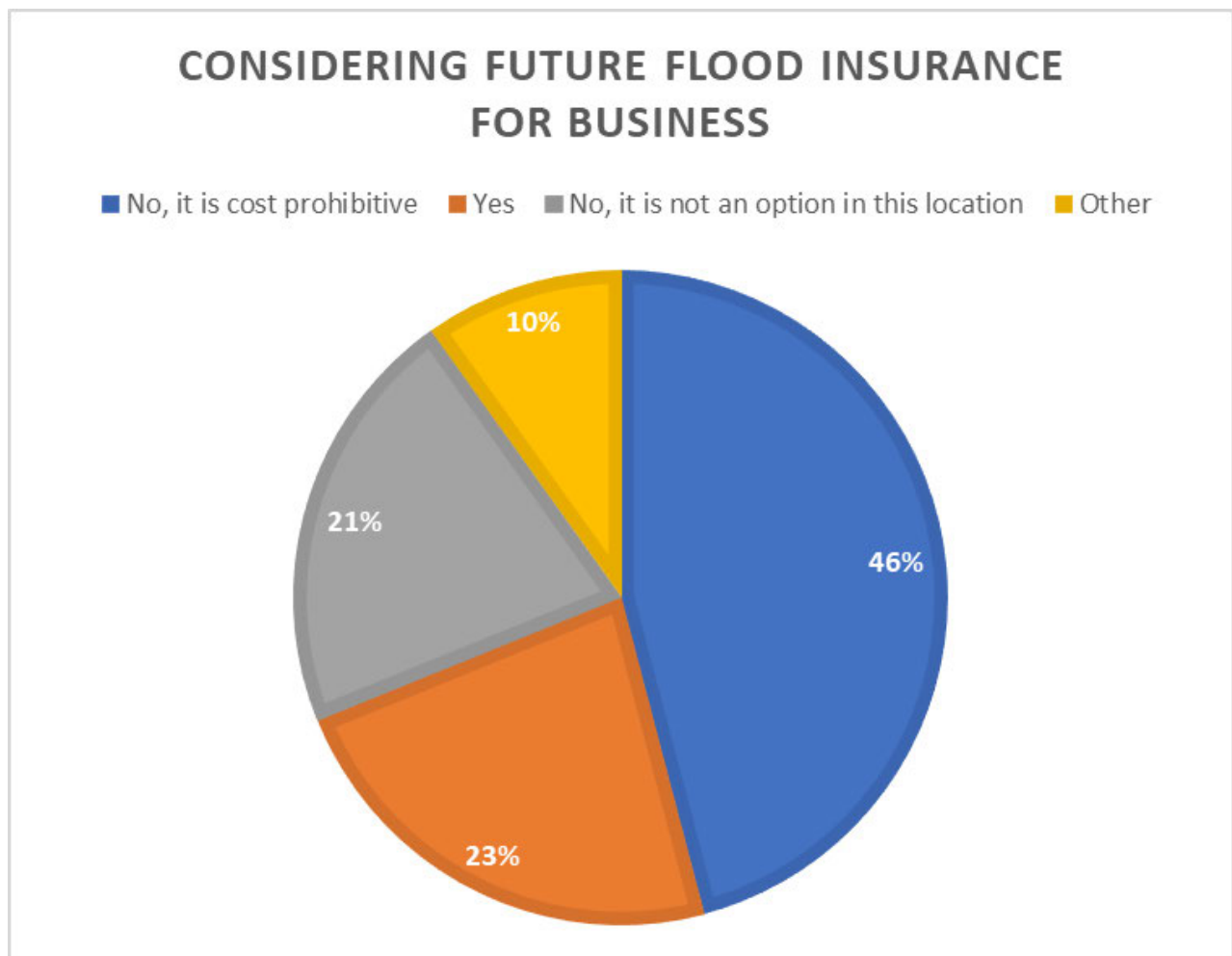
16 responses

- 1 week-3 months- 7
- Unknown- 7
- 3-6 months- 1
- More than 12 months – 1

Summary

Of the 16 responses, 7 businesses do not know when they will reopen and another 7 estimate reopening in 1 week to 3 months.

Will your business be taking out flood insurance for future operations?



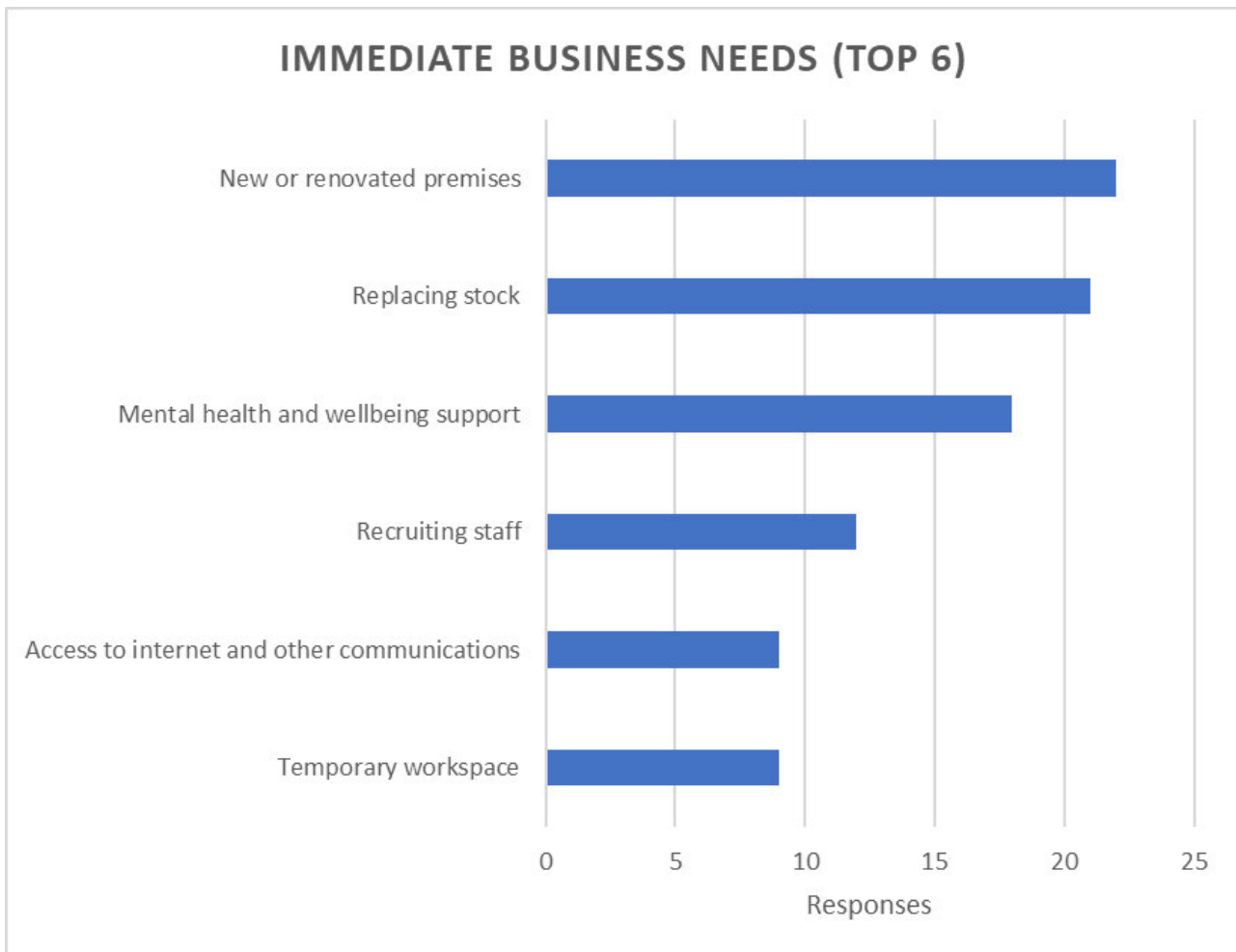
Responses

- No, it is cost prohibitive- 28
- No, it is not an option in this location- 13
- Yes- 14
- Other- 6

Summary

28 of the 62 respondents said they will not be taking out flood insurance for future operations as it is cost prohibitive, 14 will be taking out flood insurance and 13 stated that flood insurance is not an option at their location.

What are your immediate business needs?



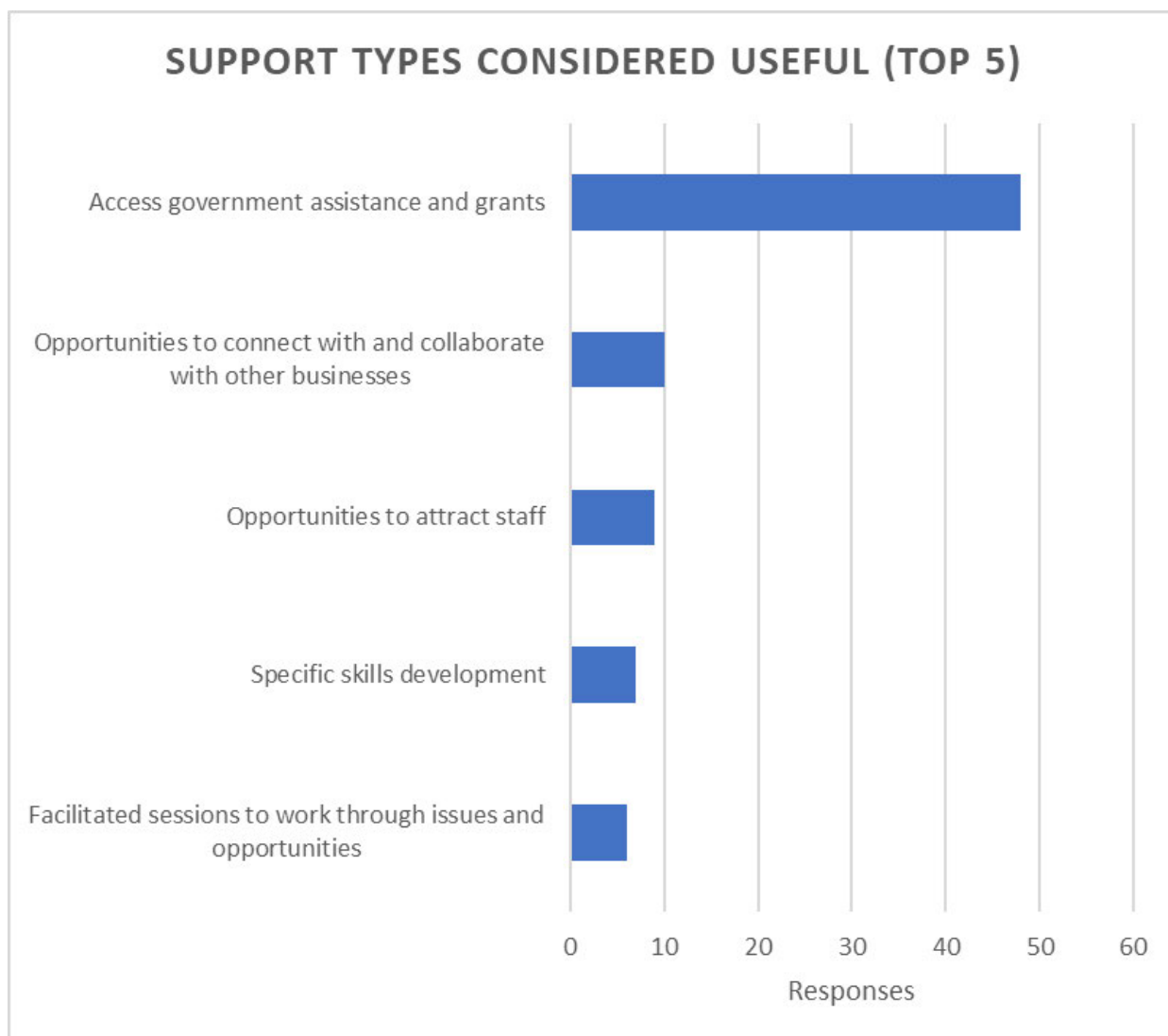
Top 6 responses

- New or renovated premises- 22
- Replacing stock- 21
- Mental health and wellbeing support- 18
- Recruiting staff- 12
- Temporary workspace- 9
- Access to internet and other communications- 9

Summary

Respondents could select more than one response for this question. New or renovated premises, replacing stock and mental health and wellbeing support are some of the top responses for businesses' immediate needs.

Which of the following types of support would you find useful?



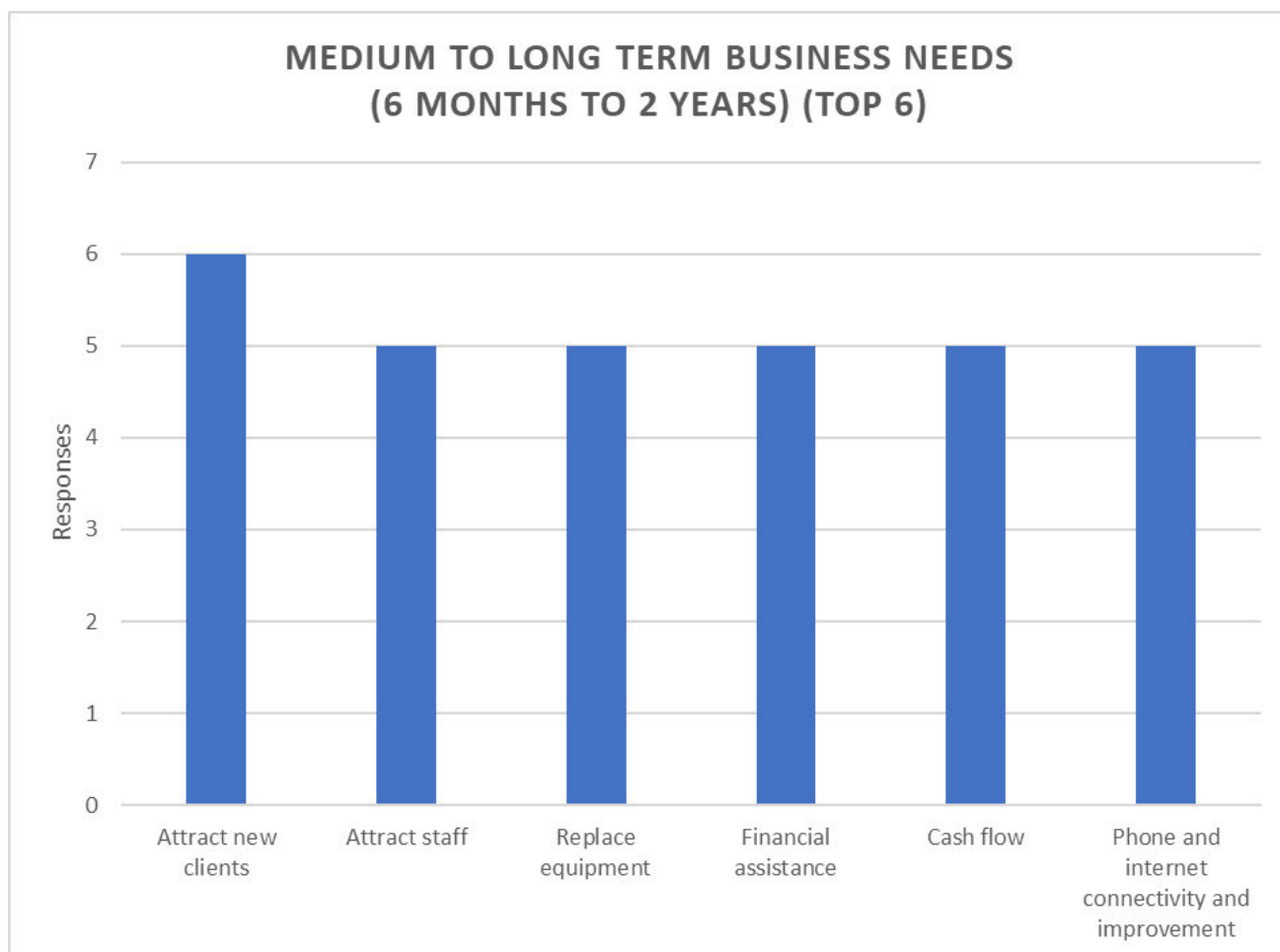
Top 5 responses

- Access government assistance and grants- 48
- Opportunities to connect with and collaborate with other businesses- 10
- Opportunities to attract staff- 9
- Specific skills development- 7
- Facilitated sessions to work through issues and opportunities- 6

Summary

Respondents could select more than one response for this question. Of the 80 responses, 48 businesses found accessing government assistance and grants useful for supporting their business at this time.

What are your medium to long term business needs? (6 months to 2 years)



Top 6 responses

- Attract new clients- 6
- Attract staff- 5
- Replace equipment- 5
- Financial assistance- 5
- Cash flow- 5
- Phone and Internet connectivity and improvement- 5

Summary

Businesses' medium to long term needs include attracting new clients, attracting staff, replacing equipment, financial assistance, cash flow and phone and internet connectivity and improvement.



BYRON
SHIRE
COUNCIL

FOR MORE INFORMATION

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**Byron Shire Council Community Roundtable Meeting held 10 May 2022
NSW Flood Inquiry Submission Community Feedback**

APOLOGIES

- Magdalena Gustafsson – Suffolk Park Football Club
- Patrician Warren – Foreshore Protection Group

ATTENDING

- Mayor Michael Lyon (Chair)
- Ian Wills – Ocean Shores Country Club / North Byron Chamber of Commerce
- Ron Priestley – MARRA
- Dale Emerson – Mullumbimby Residents Association
- Donald Maughan – Suffolk Park Progress Association
- Michael Sherrington – New Brighton Residents Association
- Asren Pugh – Byron Shire Councillor
- Wendy Chance – Wategos Protection Society
- Patricia Warren – Foreshore Protection Group
- Sharyn French
- Dale Emerson – Mullumbimby Residents Association
- Cr Alan Hunter
- Cr Sama Balson
- Cr Mark Swivel
- Cr Duncan Dey
- Cr Peter Westheimer
- Mark Arnold
- Michael Lyon
- Shannon Burt
- Es Davis
- Annie Lewis

Ian Mills – Ocean Shores Country Club and North Byron Business Chamber

- GM – Country Club integral part of the community.
- Competing interests – need water to maintain the golf course and have several water storage areas (reservoirs) on the course.
- Questions about impact of the water holding areas on local flooding.
- Flood Management study – concluded that lowering of the tide gates would have net impact of around 10mm.
- Don't believe this really contributes to flooding.
- If gates are removed then this would compromise ability of club to store water.
- Would like club's needs to be considered – need water to irrigate the course.
- Prior to rain events in 2020 – drought – exploring avenues to secure bore water – from one extreme to another.
- North Byron Business Chamber – not a lot of consultation.
- Infrastructure has not been maintained.
- Numerous drains all flow into OSCC and only since post flood have we had contact from council re: managing of drains and removing of silt and debris.

Miranda Chance – Wategos Protection Society

- Regarding floods and issues around the Shire – Wategos issues aren't predominantly as bad as the rest of the Shire.
- Just wants to be a part of the conversation and a new member of the roundtable.

- Miranda to send Councillors a list of actions/concerns of the group (generally).

Dale Emerson – Mullumbimby Residents Association

- Karl Allen is the specialist. Dale filling in.
- A document has been prepared and will be sent to the roundtable.
- Residents Assoc has a public meeting on Monday 16 May about the floods...where, causes, factors, responses.
- One thing raised is the railway line and blockage and the drainage works.
- Drainage and flood overflow is a major concern.
- Water is coming in but how does it get out as well?
- Response – in Mullumbimby – the whole effort of the volunteers at Civic Hall, MDNHC and RSL – magnificent...also ongoing work of Recovery Centre.
- Residents Association wants to acknowledge the work of locals and the Council for the clean-up, mud army etc.
- Interested in – causes, factors, but looking for feedback to submit to Council re: voluntary house raising scheme...want to look at how Mullum Residents Assoc can have a dynamic, active house-raising scheme.
- Looking at best practice and less red tape and MARA happy to help council with this.
- Water-proofing of houses that can't be raised.
- Voluntary acquisition of houses that can't be raised/waterproofed etc.
- MARA would like to see a vision of where Mullum is going to be at the next flood.
- Communications in relation to the early warning system, evac routes, where to go and where not to go.
- Second flood – people informed to go to Ocean Shores but people couldn't get there.
- Would like an evac centre that is accessible to Mullum residents and Ocean Shores is not.
- Karl sending in more detailed and scientific submission.

Michael Sherrington – New Brighton Village Association

- Acknowledged the traditional owners.
- Lived in area since 6yrs old. Fair knowledge of area and trained earth scientist.
- We are all different groups – flood drains and flood plains impact all/multiple areas.
- Have compiled historic review of Marshalls Creek – reviewing flood and land form changes from 1947 to recent times which show changes and impacts on drainage systems in area.
- Show changes to drainage patterns that have resulted from development of New Brighton area.
- Allowing excess water from flood inflow to reach the ocean – currently water backfills.
- One member has completed a review of the study and combining the document and happy to share that with Council.
- Group meeting this evening with OS, SGB, NB, Billi – combining to form a single voice for the north of the Shire.
- Location impact of the flood event in relation to NB – has done a prelim model of where the flood heights reached and is getting more information but approx. 60-75cm higher than any previously recorded flood.

- Came across Gaggin St and was touching back foredune of the beachfront.
- Looking at modelling volume of water
- 50% of houses in New Brighton. Similar in SGB. OS as well but more hilly.
- Responses and recovery – response from Council was fantastic.
- Significant amount of rubbish cleaned up within 2 weeks. Very impressed by community initiative.
- Coastal belt – flood response – SES couldn't get to coastal belt.
- Great to have some local infrastructure that could allow/provide immediate support. E.g. UHF radio networks where everyone has frequencies, establish a small SLS-type response ?? in community centre (boat, emergency kit) so people can get out and about help others quickly.

Action – Michael Sherrington to send through document to Councillors and staff.

Ron Priestley – Main Arm Rural Residents Assoc (as per MARRA submission to Council)

- 7 issues
 1. Near total failure of comms (phones, landline and mobile, couldn't dial 000)
 - Only comms were through local resident with satellite internet via Starlink.
 - ABC radio does not get down local enough; BayFM has reception and should be used for emergencies.
 - Satellite emergency public phones should be available in flood-prone communities.
 2. Kohinur Hall – scoured foundations.
 - Can Council arrange grant for diverting swift water to protect the hall?
 - Can Council inspect all properties and carry out flood mitigation measures.
 3. Upper Main Arm Public School – is closed but locked and going mouldy.
 - Can Council approach Dept of Education to reactivate this vital entity.
 4. Road paving – Council did magnificent and expensive job in immediate repairs.
 - Concrete roads did not fail but bitumen did. All roads below flood level should be concrete so that they will be there post-flood.
 - Council appears to have abandoned concrete for bitumen
 - Council did not allow highly skilled private operators with excellent local knowledge to help/work on reopening houses
 5. Housing – houses lost due to land slips, not directly by flooding. residents need grants, assistance, and temporary accommodation while they rebuild.
 6. Fire APZ clearing rules lead to bare areas that lead to landslips.
 7. Flood mitigation to reduce flood levels are unlikely to succeed.
 8. Landslips leave bare ground. This is an opportunity to replant with natives rather than let the weeds take over.

Donald Maughan – Suffolk Park Progress Association

- Problem with audio. Submission will be sent in.

Patricia Warren – Foreshore Protection Society

- Hope floor-space ratios are looked at, especially in Brunswick Heads.
- Michael Lyon – all the grants are assessable income.

NSW GOVERNMENT FLOOD INQUIRY**LGA: BYRON SHIRE COUNCIL****LOCATION: BRUNSWICK HEADS****WHY NOW AND NOT BEFORE DID THE WATER LEVEL RISE AT NO 3 MONA LANE AND NO 12 RIVERSIDE CRESCENT BRUNSWICK HEADS NSW, FEBRUARY 2022?**

SUMMARY: *The low pressure system that had 'stationed' itself off the east coast produced an unprecedented 'rain bomb'. By 28th February 2022 the water table had risen to the surface level following intensive and extensive rains*

Rising water levels at both properties exposed a drainage system that is not fit for purpose and has been in that condition for decades. Whilst it would be impossible to have a drainage system able to cope with the volume and velocity in its catchment in this case, a 'fit for purpose system' would have been able to mitigate storm water damage by allowing it to get away on the outgoing tide before the morning high tide at 7.45hrs.

Natural water storage areas have been infilled for residential development with consequent impacts on the immediate allotments as well as forcing water to find its own level elsewhere either naturally and/or because of inadequate drainage associated with that infill.

Council's LEP has meant that permeable land on residential allotments is being lost to hard surfacing which is exacerbating the drainage issue because the catchment area of the roof tops feeds into the immediate drainage system.

The then Roads and Traffic Authority's engineering in the local area for the M1 dual carriageway has exacerbated the stormwater runoff problem at Riverside Crescent with its 'watershed' configuration at the roundabout and inadequate drainage system from the paper bark swamp on the west to the salty marshes on the eastern side of highway. Water subsequently built up and turned back to find an alternative path to the river.

The collection system to the Brunswick Valley Sewerage Treatment Plant is not fit for purpose in rain events, a condition that has been known for decades. Diluted raw sewage from overflowing gravity mains added contaminants to the rising waters. A properly functioning collection system would have mitigated damage from contaminants, reduced the inflow into the STP and minimized any alleged sewage overflow from manholes.

Siltation of the Brunswick River forces waters from the catchment to find their own level and broke the banks of the river in places on an outgoing tide.

'NORMAL' WET WEATHER CONDITIONS BEFORE FEBRUARY 2022 AT 3 MONA LANE, BRUNSWICK HEADS NSW 2483

1. I have lived at 3 Mona Lane, Brunswick Heads, NSW 2483 for 36 years... It adjoins the Brunswick River to the north and has, until February 2022, been a dry block for that time
2. To the south of the block is Mona Lane. The laneway's gradient is from east to west. The lane's camber is from north to south.
3. There is a large stormwater drain on the western end of Mona Lane with an opening into it on either side of Mona Lane. This drain's purpose is to channel storm water into the Brunswick River.
4. To the east of the laneway is Memorial Park. South and parallel to Mona Lane is Fawcett Street. To the west is Tweed Street
5. Under 'normal wet weather events', storm water pools on the western side of Memorial Park then overflows into the gutters of Mona Lane adding to the stormwater already feeding from the adjoining dwellings into the drainage system. Because of the lane's camber, dwellings no 4 and in particular 2, would get water into their downstairs area. Over the years, No 2 in particular, has used bound rolls of coconut fibre to stop this water. Summed, local knowledge about the drainage system meant that households in the laneway could 'manage' a rainfall event. Being on the higher level of the road camber, Nos 1,3,5 and 7 have never experienced any wet weather problems.
6. A noticeable change in the last couple of years is the impact of a development at No 5. The discharge from this development, in both volume and velocity fills the gutter on the northern side of Mona Lane to within a few millimeters below the storm water outlets from No 3. Previously, there had been a lot of open space on the 1,078sqm block and rain could readily soak through porous soils into the water table. Now, with the extent of hard surfacing rainwater is initially fed into an en-site tank with excess going into the drainage system. Given the high rainfall regime current to the local area, that tank is generally full so storm water continues to feed into the drainage system. Similarly, the renovations/extensions to No 6 Mona Lane have increased the runoff from the now flat roof and ground level hard surfacing. The loss of permeable land under Council's LEP is blatant in terms of its consequences on the infrastructure.
7. The gutters in Mona Lane are not fit for purpose. They are not cleaned and have accumulated silt, sediment and grass so storm water cannot get away efficiently as was intended. This has been the case for decades.
8. The storm water pipes at the end of Mona Lane feeding directly into the river are normally choked with leaf litter which, in part is induced by peoples' behavior.

WHAT HAPPENED IN LATE FEBRUARY 2022

9. By February 28th, there had been extensive rains and the water table at No 1 Mona Lane was at surface level. The extent and intensity of rainfall would be recorded by BOM but those figures are from a rainfall collection point inland from Brunswick Heads at Fairview Farm. However, an indication of the rainfall can be gleaned by looking at the inflow figures on Council's website for the Brunswick Valley Sewerage Treatment Plant (BVSTP) whose collection system includes Brunswick Heads and Mullumbimby.

The design capacity of the BVSTP is 3,800kL/day. Normal Average Dry Weather Flow (ADWF) is 1,300kL/day. The STP has inflow/infiltration problems because the gravity mains are not fit for purpose. Surface water and a rising water table allows water to get into the earthen ware pipes. This means the STP is treating stormwater at inflows above its design capacity. The following daily inflow figures are indicative of the storm water entering the collection system over the relevant period.

DATE	INFLOW kL/day
22.2.22	1,971.09kL
23.2.22	8,438.54kL or 2.22 times design capacity
24.2.22	13,580.20kL or 4.36 “
25.2.22	8,949.11kL or 2.35 “
27.2.22	17,726.86kL or 4.67 “
28.2.22	20,694.40kL or 5.45 “
01.3.22	14,544.50kL or 3.83 “
02.3.22	9,214.47kL or 2.42 “
03.3.22	8,072.30kL or 2.12 “
04.3.22	8,990.85kL or 2.37 “

10. High tide was at 7.45hrs with a height of 1.80m and again at 20.01hrs at a height of 1.25m. However, the water level in the downstairs area of No 3 was rising well before the night time high tide. It didn't pose a problem at the morning's high tide that day.

11. It was obvious earlier in the day that the drainage system could not cope with the volume/velocity of storm water feeding into it. The water level in the gutter at the entry to No 3 Mona Lane was about knee deep but had not entered the dwelling or the undercover garage area.

12. Later, in the day, and adding to the problem of rising water in Mona Lane, was water that had flowed from west to east across Tweed Street from west of Pandanus Court and Byron Street. The area west of Byron Street was originally a swamp. It was filled with material dredged to create the Brunswick Boat Harbour and then developed for residential purposes in Bower and Cudgen and part of Fingal Street.

13. The water coming from the west flowed across into Fawcett Street and added to the volume of water already flowing into the drainage system from the east along Mona Lane. Water also flowed from south to north across and along Tweed Street from approximately the corner of Tweed and Mullumbimbi Street. This water added to the rising waters in Veteran's Lane.

14. Since the drainage system was already unable to cope with the volume and velocity of water flowing into Mona Lane, water flowing south to north down Tweed Street towards Massy Green Holiday Park and Mona Lane acted like a dam. Water backed up. The water level on the western side of the dwelling at No3 was raised and pooled on the lawn to the north. To the south of the block, the garden was virtually covered. Rising water also flowed throughout the downstairs of the dwelling. This was occurring well before the high tide at 20.10hr which meant that rising water levels were occurring on an outgoing tide. There are varying heights between the cement slab and the ceiling under the house. At the highest, the water level was at knee level at the bottom of the stairs on the south of the house to the hob leading into the downstairs area proper.

15. The gravity main was overflowing and diluted raw sewage from the inspection points at No 2 and 3 was also flowing into the water in Mona Lane.

16. No 7 Mona Lane, being slightly more elevated, did not incur any damage. No 6 Mona Lane's downstairs flats only incurred minor damage with water touching the keyboards in each kitchen. No 4 Mona Lane's downstairs garage and flat were damaged. No 2's downstairs garages and bathrooms/laundries were flooded. No 5's basement area filled to waist high. No 3's downstairs area was flooded with water depths of varying levels up to knee level. The two cars, which could not be moved because of the water level in Mona Lane were had water through them. One of the cars was subsequently written off. No 1 Mona Lane's downstairs laundry and garage area was flooded.

17. For the first time in 36 years of living here I witnessed the Brunswick River breaking its banks in front of No 3 only. That break did not extend to any other part of the foreshore. Water pooled in a slight hollow adjoining the foreshore. It caused minor flooding directly from the river with dimensions approx 5m wide x 8m long x 10cm in depth in a convex shape to 1.5m north of the Norfolk Pine.

I am aware that opposite the Brunswick Hotel, the river broke its banks and flowed across part of Banner Park and Mullumbimbi Street to the pub's brick fence. The question is why couldn't the river accommodate the waters from the catchment feeding Simpson's Creek? The siltation of the estuary, together with that elsewhere is known to locals. Over the period of 36 years, the visible evidence of increasing siltation of the Brunswick River has been massive. To give you an example; in 1986 when I first came to Brunswick Heads, I could swim over arm across Simpson's Creek and barely touch bottom at low tide. Now I can walk across that same width at low tide on exposed sand. To the east of No 3, the rock walls, known as the 'dog-leg' have function as a sand catchment area which now extends west to the tip of the eastern rock wall of the caravan park. The one remaining operating trawler in Brunswick Heads oftentimes gets stuck on the extending sand bank.

12 RIVERSIDE CRESCENT, BRUNSWICK HEADS

'NORMAL' WET WEATHER CONDITIONS BEFORE FEBRUARY 2022 -

1. I have owned this dwelling since August 2001. I researched its history before purchasing the dwelling from flood level marks recorded at No 6 Riverside Crescent. No 12 had always been a dry block during all prior flood events. In fact, it was the only dry block within the loop road adjoining the 12 dwellings because the site had been infilled at the time of construction in the early 1970s.
2. The adjoining drainage system is not fit for purpose and no attempt has been made to make it so;
 - (i) There is a deep drain on the eastern side of Ferry Reserve Holiday Park that has been blocked for decades.
 - (ii) There is a shallow drain on the southern side of the holiday park opposite No 12 which similarly has been blocked for decades.
 - (iii) There is a vegetated shallow drain adjoining No 10,11, 12 and 1.

- (iv) There is a vegetation shallow drain adjoining No 6,7,8 and 9
 - (v) There is a deep drain on the southern side of the loop road adjoining dwellings nos 6,7,8,9 and 10. That drain collects water principally from the drainage system on the adjoining agricultural property to the south. It has been blocked/vegetated for decades. During rainfall events it is also influenced by tidal movements.
 - (vi) There is a deep drain across the foreshore on the western side of the loop road opposite No 1 Riverside Crescent. It is vegetated and like all the other drains, not fit for purpose. This drain is on Crown Land.
3. The then RTA constructed a new 'back road' as part of the new M1 to access the 12 dwellings. Prior to that, entry and exit was along the then public road adjoining the foreshore. The gradient of this new 'back road' slopes from east to west promoting surface runoff into a drainage system unfit for purpose. Engineers chose to ignore local knowledge about the drainage system when doing the back road. They also ignored local knowledge about the natural flow of salt water through the paper bark swamp across the area now taken with the M1, to the river.
 4. During a rainfall/storm event, No 12 has never flooded be it from stormwater in the drainage system or the Brunswick River breaking its banks along the foreshore. Surveyed height levels for the locale are available in the Plans of Management Ferry Holiday Park December 2013 at Appendix B. Sheet 4 is relevant to the elevation levels. The manhole in front of No 1 is 1.39m. With infill at No 12, this puts the elevation above that and in fact makes it the highest elevated land within the loop road. The allotment has only been recently deemed in a flood study as of 'intermediate' risk.

CONDITONS IN FEBRUARY 2022

5. High tide on 28th February was at 7.45am at a height of 1.80m and 20.01pm at 1.25m
6. Well before the morning's high tide, water was coming from the south-west. Google Earth gives a clear visual of both the natural and man made drainage system in the area. Water used to flow from those drains into the
 - (i) natural outlets in the Nature Reserve and enter the river on the eastern side of the highway via the salt marsh flats and paper bark swamp that spanned east and west of the road. The then RTA's poor drainage system for the M1 has been inadequate from the start because it makes it difficult for waters from the west to access the river on the east of the highway. The evidence of how the RTA blocked the natural flow of water through the paper barks and salt marsh swamp is well known to locals because the area was good for mud-crabbing. Once the M1 was constructed the crabs, who are dependent on salt water, no longer inhabit the area.
 On the 28th given poor maintenance of the RTA's drains, plus the inadequacy of them, the water could not get under the M1. Consequently 4hrs before the morning high tide at

7.45am, the waters turned back and onto Riverside Crescent at which time local residents had to open the barricades at Ferry Holiday Park themselves and move vehicles to higher ground. Waters continued to rise well before the high tide.

(ii) the drain on the southern side of the loop road, Riverside Crescent has never been fit for purpose because it is blocked with a mangrove system reclaiming land and trees reclaiming the road reserve. The result was that rising water backed up and sought the lowest pathway to the river. The lowest point in the loop road has to be where water stagnates in front of Nos 11, 8 and 7 Riverside Crescent.

7. A combination of prolonged rainfall, a saturated ground water table at site No 12 meant that stormwater entered the downstairs area of the house.
8. Diluted raw sewage from the gravity main manhole near No 12 would have added to the problem of rising waters given the gradient of Riverside Crescent is from west to east.
9. It is undisputed the river broke its banks at a time after water had already entered the downstairs area of the dwelling.
10. Rising waters was thus a combination of both stormwater runoff and the river breaking its banks during an unprecedented 'rain bomb' event.

Patricia Warren
3 Mona Lane,
Brunswick Heads 2483

04.05.2022

COUNCIL ZOOM MEETING

MARRA SUBMISSION 10th May 2022

NOTES FOR SUBMISSION

My name is Ron Priestley and I am President of the MAIN ARM Rural Resident's Association MARRÁ. I have been a resident of Upper Main Arm for 50 years and have had extensive experience of floods and recovery

Communications

Problem:- There was a near total failure of communication. Power, landline phones, mobile phone towers, access to Internet via landlines have all failed

As there were no landlines and all mobile phone towers failed it was not possible to dial 000. The 000 network does not seem to have a satellite connection

Solution:-The only communications possible were when a generator was available and the owner had satellite Internet. Residents should be supported in acquiring generators and satellite Internet. Elon Musk's system is available to all whereas the NBN Skymuster system is not

Battery powered radios could receive information from a secure radio station. ABC radio does not cater for small local area problems but Bay FM could be set up with stand-by generators and a flood free site. Bay FM could then act as a clearing house transmitting to the battery powered radios

Also satellite connected emergency public phones could be established in the flood prone communities . These would be similar to the solar powered ones you can find on walking trails in remote National Parks throughout the world.

Kohinur

Problem:- The flood waters raged under the Hall and reached slightly above the lower floor level. The speed of the water was enough to scour the foundations and lead to collapse. The Hall proved its worth during and after the floods as a vital community resource. It is still being used for the emergency

Solution:-As the Owner of the Hall could Council please organize foundation protection for the future. I am a retired Builder and do not expect it would be possible to stop water ingress but a protection design which deflected the fast running water is needed. Still water ingress is far less likely to cause damage

It would be wise if Council were to inspect all its properties and carry out necessary flood mitigation measures

Upper Main Arm School

Problem :-Most of the buildings survived but the old heritage listed original classroom had water run through and there has been minor shifting of foundation piers. No-one has cleaned up the old building and mould is being allowed to grow. The buildings are now fenced off and admittance disallowed There have been previous attempts to close the school but it is a vital resource for the community and closure has been and will be firmly resisted. It is the core of the Main Arm community

Solution:-There was a time when the community would have simply repaired the building already and the school would be up and running again already. But now the "authorities" appear to be doing nothing except encourage deterioration. Please assist in rebuilding and reopening. All the children are now being sent to Durrumbul school whose headmistress is said to be notorious for losing 90% of pupils; reducing enrolments from 40 to 5 due allegedly to mismanagement and poor disciplinary problems.. The Upper Main Arm children should not be subjected to similar treatment

Concrete road paving

Problem:-The most vital need straight after a flood is to open the roads for vehicle access. Then the community can look after itself without the need for helicopters, food deliveries, medical help and medicines being brought in etc and the community can access all other resources.

Solution;- Council did a magnificent (and expensive) job in emergency repair and filling road wash outs but better prior better construction methods would have avoided much of the necessary work. Council had a programme for gradual replacement of bitumen with concrete pavements in areas where the roads flooded. None of the concrete pavements failed and access was possible to Kohinur as soon as water levels dropped. Numerous bitumen paved roads failed however under the flood waters leading to very serious erosion. The scour outside Kohinur Hall could have held a single decker bus, for example. All floodable roads should be concrete and this I think is the most urgent need of all. Council appear to have abandoned the programme for replacing bitumen with concrete.

There is also a very annoying demand from Council that locals due not use their own equipment for temporary road repairs, tree removal etc but demand we stay without access until Council machinery arrives later. There is a great wealth of good machinery in the valley with operators who have probably had more experience than Council excavator operators in repair of flood damage To demand and even fine local operators who are willing to assist in opening access is downright insulting and regressive.

Dangerous Houses

Problem:- Many houses have failed due to slips and others may be under threat. Authorities are likely to demand demolition, extensive alteration , eviction and bans from re-entering as has happened in Lismore.

Solution;- Residents affected need to be treated properly and fairly with grants, assistance, temporary housing and fair resumption payouts if necessary. Compounding their current misery with draconian edicts such as eviction orders must be avoided

Conflict between fire clearing rules and need to avoid slips

Problem:- There is a Council rule that properties should have no trees for a horizontal distance of 50 metres. These enforced cleared areas have been responsible for exacerbating damaging leand slips where the trees have gone.

Solution;-Serious new legislation is required which will preserve and enhance new tree planting. The fire risk in this wet Shire is far less than the danger of slips

Flood mitigation measures unlikely to succeed

Problem: There has been discussion on providing measures to reduce the height of floods by dredging, levees, culverts,ocean outlets etc- As a retired Quantity Surveyor /Builder I know these measures are extremely costly.

Solution;-Many of these measures will only reduce flood levels by a few millimetres and are not worth the cost, and the environmental destruction involved. Therefore they need serious expert input and very careful engineering. It would be a tragedy if all available funds were wasted on such measures. Do not doubt that the recent storm has a massive tsunami like effect which cannot be economically controlled. Measures such as moving and raising houses are far preferable. We cannot hold back these type of flood

Finally

All of the above issue could be further examined and expanded with additional detail

MRA is an active community organisation for and by the residents of Mullumbimby. We appreciate the opportunity to contribute Councils report on recent flooding events



Mullumbimby Residents Association

1. Statistics

After the floods in 2017 there were no statistics gathered to capture the true extent of the damage. Statistics need to be gathered on the 2022 flood event:

- a) The number of houses flooded.
- b) The number of vehicles lost.

2. North Byron Floodplain Risk Management Study and Plan.

Many issues with flooding in the Mullumbimby township have been recognised in the adopted 2020 [North Byron Floodplain Risk Management Study](#) (FRMS) and [North Byron Floodplain Risk Management Plan](#) (FRMP), many of the priority actions identified have not been funded or actioned upon.

A review of the FRMS including options that required more investigation and the FRMP priority actions needs to be completed once technical data is analysed. (See the amended table with priorities relevant for Mullumbimby on page 5 of this submission).

3. Flood Mitigation Options:

a) Voluntary House Raising Program.

The most cost-effective flood mitigation option for Mullumbimby is house raising, the FRMS identified 37 properties in the township that met the criteria in 2020, there will be many more after this latest event. Many in the community have shown interest in this scheme but the current arrangement of 2 houses a year is not acceptable, the scheme needs to be streamlined and funded ASAP. A moderate priority in the FRMP.

b) Flood Proofing of Homes.

Brisbane City Council has piloted a Flood Resilient Homes Program, residents of Mullumbimby would benefit greatly with funding by the NSW Government for a similar program. A high priority action in the FRMP.

c) Buy Back Scheme.

Buy back of properties is also one of the most cost-effective management strategies for properties located in the floodway who are frequently flooded and subject to high hazard. Mullumbimby was identified in the 2020 FRMS to have 9 properties that meet the criteria. Funding is required.

d) Further Flood modelling.

There are flood mitigation options in the FRMS that require more investigation. Funding will be required for the following:

- The railway line bisects the floodway, the impact of this obstruction on the floodway needs more analysis. A combination removal of the railway line and raising/flood proofing of houses in the east of Mullumbimby may have a positive outcome.
- Removing spur walls at the junction of the Brunswick River, Marshalls and Simpsons Creek requires further modelling.
- Saltwater Creek upgrades need further modelling. FRMS section 12.1.4

4. Previous Planning and Development on the Floodplain.

There has been development on the floodplain that has contributed to increased flooding in the township of Mullumbimby. The FRMS has identified Mullumbimby as sensitive to cumulative filling and the most sensitive to future floodplain changes.

(FRMS section 8.1.4.1).

- a) Tallowood Estate has increased runoff.
- b) Towers Industrial Estate has decreased floodplain storage and changed the flow path.
- c) Orchid Place filling of land has decreased floodplain storage and changed the flow path. (DA99/0641 rejected by council but approved by the NSW Government in 2000.)
- d) Secondary dwellings have increased runoff.
- e) The affordable housing project DA 10.2017.474.2 currently under construction at 70-90 Station St, Mullumbimby obstructed water from passing under the railway line.

5. Community Education and Vulnerable Community

- On the 24th of Feb 2022 a camper trailer was flooded in Heritage Park, council had been notified by numerous residents up to a month before this date that there were illegal campers in the park.
- Many caravans situated on a private property at 39 Cedar Rd, Wilsons Creek were washed away on the 28th of Feb 2022, this left many homeless.
- Section 11.5.6 of the FRMS mentions Community Flood education and a *“priority is ensuring vulnerable population without a permanent residence are included in flood awareness and preparedness and are aware of the risks of flooding, who they can trust and where they can seek shelter during flood events”*.
- Many residents in Mullumbimby are not aware of their floor height with reference to the flood planning level and how to use this in a flood situation, even though it's available on council's website.

Why hasn't the community been educated and the vulnerable notified of flood dangers?

A moderate priority in the FRMP.

6. Evacuation Planning

Mullumbimby has been identified as requiring an Evacuation Assessment. Mullumbimby Residents Association has mentioned this at meetings with council executives twice last year. This issue was highlighted in our recent floods with human chains required to access the evacuation centre at the Ex-Services Club. Many could not get to the evacuation centre. The FRMP identified this a high priority action. (FRMS section 9.3.6).

7. Emergency Warning systems

Many in the community were not aware of the severe weather that was coming, council has an emergency dashboard. Why did the BOM not have a flood warning for the Brunswick River? It appears that Climate Change is making flood predictability much more difficult, a review of the weather models used needs to be completed. Private forecasters on Facebook were more accurate than the BOM! E.g., Higgins Storm Chasers.

Mullumbimby scenario:

- a) The FRMS section 9.3.6 *“Evacuation for Mullumbimby is triggered when Federation Bridge reaches 3.5m AHD”* This level was reached on Sunday 27/02/22 at midnight.
- b) Council posted on [Facebook](#) at 6:11AM on Monday the 28th of Feb that the SES had issued an evacuation alert at 6AM. 12 hours late!

- c) At 6:04 AM the Federation bridge gauge was already at 4.93m, too late for many residents to evacuate.
- d) Why was there no SES landline, mobile or siren alert?
- e) On the 2/03/22 at 01:14AM Residents received an SES alert on landlines about the Ballina hospital evacuation, this warning was not relevant.

Many cars were flooded near Sherry's Bridge on Main Arm Road and in the township of Mullumbimby. The FRMP has a high priority action *to identify key roads and implement automatic warning signs and depth indicators*. Funding is required.

8. SES Management

The SES had major internal changes prior to the 2022 flood event, this has resulted in the loss of long term and well-trained community members. The SES should be controlled locally and management decentralised.

9. Environmental impact.

a) Rubbish removal and Recycling:

There were many household items that were disposed of which could have been recycled or refurbished. There needs to be a better approach to sorting of items before disposal.

b) Many waterways have been severely polluted with Sewer and flood debris, there has been no announcements regarding clean-up of the rivers and estuaries. The Mullumbimby boat ramp at Heritage Park is still covered in mud, preventing access to the river. Funding for the boat ramp upgrade is required.

10. Telecommunications

Many of the telecommunication's outages were caused by landslides and water breaking optical fibre and copper cables. The redundancy of optical fibre routes needs to be reviewed by Telstra and Transmission equipment moved from the first floor of the Lismore Telephone Exchange which was inundated with floodwater.

Main Arm Exchange optical paths can be improved by transferring one existing link onto the newer optical cable. (Contact me if you require more information).

The North Coast nbn network was affected by power outages at Woodburn, a permanent backup generator needs to be installed at Woodburn Telephone Exchange.

Satellite backup systems need to be strategically placed for future disasters. Lack of local telecommunications staff and test equipment delayed recovery of the networks.

11. Future Strategic Planning for Mullumbimby

The adopted Residential Strategy Dec 2020 (currently with the NSW Government) proposes extensive development on the floodplain including South Mullumbimby and rezoning of sportsgrounds at Lot 22, 156 Stuart St, Mullumbimby. As a consequence of the recent flooding events, in Mullumbimby, Council and the NSW Government needs to review the Rural, Residential, Business and Industrial Lands strategies.

12. Use of NSW Government land for temporary housing

There is NSW Government land within the Mullumbimby CBD close to infrastructure that could be used for temporary accommodation. Some sites are:

- Gordon St behind the Police Station.
- Railway Land.

13. Infrastructure

- a) **Water Security:** The community and council are already aware of Mullumbimby's water security issues and the flood clean-up highlighted the need for a better secure water system for the township. Water restrictions were imposed due to staff not able to reach the water treatment plant just when the community required it. Recycled water from the Vallances Rd Sewage Treatment Plant could have been used for clean-up. Funding is required for a recycled water network.
- b) **Sewer:** The poor state of the sewer network is well known, the flood resulted in raw sewage mixing with floodwater and has resulted in many health issues including hospitalisation of residents. More funds are required to upgrade the sewer network ASAP.
- c) **Stormwater:** Stormwater maintenance is critical in managing smaller flood events. As part of the FRMS community questionnaire in June 2018 one of the top structural options was "Stormwater pipes, gutters and drain upgrades". (FRMS section 5.1). MRA met with council executives twice last year and raised issues regarding stormwater maintenance, the response has always been "*There is no funding*". A whole of catchment drainage model and overland flow path investigation is a high priority action in the FRMP, council has applied for grant funding but has been rejected by the NSW Government, this requires funding ASAP.
- d) **Roads:** The road network has been greatly affected by recent flooding events and extra finances from the NSW Government are required to bring them up to a safe standard.

14. Insurance Coverage

MRA is aware that there is inconsistency between insurance companies willing to insure homeowners and businesses in Mullumbimby. We would appreciate the implementation of standard conditions for both property owners and insurance companies.

In conclusion MRA requests:

That the State Government arrange for funding to be available to communities, in a timely manner, to implement resilient programs as necessary, including:

House Raising; Buy-Back; Rebuilding; Flood Proofing; Community Education, Flood Mitigation Programs according to updated flood mitigation plans and Road Safety maintenance.

Karl Allen, for Mullumbimby Residents Association,

Email: kallen1@bigpond.com

Mobile: 0428641613

1. Extracted and Amended from Table 1 of Byron Shire Councils FRMP, new priorities.

Actions relevant to Mullumbimby flooding	ID	Section	Rank as in 2020
1. Update Flood Planning Levels to the 2022 flood experience	PM04	11.6.4	1
2. Update the Local Flood Plan (BSC and SES) based on the 2022 experience and on the 2020 Floodplain Plan	RM01	11.5.1	11
3. Establish flood free Evacuation Centre or Centres for Mullumbimby	RM07	11.5.7	4
4. Identify access routes to and from Mullumbimby and mark with automatic warning signs and depth indicators	RM05	11.5.5	4
5. Develop a Flood Warning system, with SMS and siren warnings	RM02	11.5.2	2
6. Establish a Flood Resilience Scheme for homes and businesses, with three main elements:			
(a) house raising.	PM01	11.6.1	11
(b) house purchase.	PM02	11.6.2	20
(c) at level protection, e.g., wet-proofing.	PM08	11.6.8	4
7. Flood and floor level info for each property in the floodplain. Education on how to find it.			
8. Assess whether suburban fences raise flood levels.	WFG	11.4.4	20
9. Assess whether Avocado Court drainage modifications would have produced any benefit in the 2022 flood.	AC	12.1.3	15
10. Assess whether Saltwater Creek upgrade would have mitigated outcomes for Mullumbimby for 2022 flood.	SC	12.1.4	11
11. Mandate no-fill on floodplains of the Brunswick River.	PM10	11.6.10	4
12. Build the debris control measures for Federation Bridge (project already funded).	FDC	11.4.6	4
13. Enable Council's floodplain advisory committee (comprising council, state, emergency services and community members) to oversee the implementation of the Scheme and other measures.	IC	12.3.2	11
14. Assess drainage and examine options for the New City Road area.	NCD	11.4.5	25
15. Develop a whole of catchment drainage model and overland flow path. Stormwater assessment. (Grant applied for).	CDM	11.4.6	4

To: The General Manager Byron Shire Council
Flood Inquiry Submission

As follow up to the community roundtable meeting held on 10 May 2022 (see invitation below), the New Brighton Village Association (NBVA) presents the following brief submission to the BSC for inclusion in the New South Wales Flood Inquiry.

***INVITATION**

Subject:

Community Roundtable - Flood Inquiry

Hi Michael

Following are the details for the community roundtable tomorrow afternoon.

Council is preparing a submission for the NSW Flood Inquiry and to inform our submission we want to gather information from community groups and chambers of commerce.

We are holding a virtual roundtable for community groups and chambers of commerce on Tuesday 10 May from 4pm – 6pm. The meeting will be held via Zoom.

We are hoping to receive information on:

- *Causes and factors contributing to the recent flood events*
- *Location and impact of these floods*
- *Responses and recovery so far*

If your group is interested in providing feedback to Council please nominate one representative to attend.

Flood Inquiry Submission Points from the NBVA

1. Causes and Factors Contributing to the Recent Flood Event:

1a. Causes of Flooding

Land development, sand mining and sugar cane farms all redirecting or filling in the natural drainage systems and wetland storage capacity that allow a more managed flood flow through the hydrological system. These are a key cause of flooding in the northern part of the Byron Shire LGA.

Land development in the late 1940s within the coastal areas between Wooyung and New Brighton infilled or redirected many of the original drainage systems. This has resulted in continued and excessive flooding in the New Brighton village and the broader local area including South Golden Beach, Billinudgel, Ocean Shores and beyond.

Background:

The New South Wales Government commissioned and built a Digital Terrain Model of these areas compiled from historic aerial photography over a period of almost 60 years dating back to 1947. This model provides a clear and concise record of the changes to land form and drainage systems in this region. (Review Report attached as Appendix One)

These changes have had significant effects on the hydrological flows within the immediate Brunswick Valley catchments of Marshalls Creek, Billinudgel Creek, Yelgun Creek and the Brunswick River and further afield in the Crabbes Creek and Burringbar Creek catchments that feed into Marshalls Creek through the wetlands of the Billinudgel Nature Reserve.

These changes have affected the flooding impacts during significant rain events and in particular during events defined as moderate or major floods.

1b. Contributing Factors

- Lack of Maintenance in the local drainage systems and street channel runoffs
- Failure of the South Golden Beach pumping station due to power failure
- Potential reduced river flow during floods from the Readings Bay rock wall
- Lack of information from the long and unprecedented communications failure was a significant factor during and in the rescue and recovery phase and put many lives at risk.

2. Location and Impacts of these Floods:

2a. Location

Flooding in the late February 2022 event was observed to be 600 - 800mm higher than any previously recorded events at New Brighton and reached an RL of ~3m and possibly higher. This impacted approximately 80-90% of buildings in the village (~180 homes) including the local Post Office General Store and Café and the village was cut off for two days.

2b. Impacts

Local road, bike, drainage and pedestrian infrastructure was moderately to severely damaged in places. The river banks have been severely impacted with tree collapse and rubbish still in the river. Contamination from sewerage systems that were inundated is unknown but potentially an ongoing impact. The main thoroughfare and coastal connection access from SGB to Ocean Shores along River Street is now in danger of collapse.

The dune face at New Brighton and SGB has been reduced as the slow moving low pressure system with associated large waves and elevated storm action caused extensive beach and dune erosion over the 2 - 3 day event.

The damage to personal property and housing has been significant and ongoing with all the streets in New Brighton having to deal with the extensive household goods clean up that went on for approximately 2 weeks.

The social and health welfare impacts on many residents have been major as many are now displaced, leaving their home and their village for many months while waiting on repairs.

Impacts to wildlife habitats are not noted in this submission.

3. Response and Recovery So Far:

3a. Response

Various local state and federal government agencies responded to the crisis eventually but in the immediate rescue and early recovery phase it was the local community that were the first responders.

These groups require simple infrastructure support, for example an active boat and boat shed with rescue capacity for volunteers in the village, and UHF radio made available to local volunteers to activate in emergency response.

The size and scale of this weather system has impacted the ability of Insurers to deal with claims and respond in a timely manner and those without Insurance have dealt with the situation as they can. Service NSW established a recovery centre at SGB and Mullumbimby and they also provided a mobile service with pop up locations. To my knowledge, nothing was provided in New Brighton. The overall response could have been more co-ordinated and rapid and there are lessons for agencies at all levels to have strategic planning in place for future events.

The community will work to compile a more comprehensive response for BSC over the coming months.

3b. Recovery

Short term

The flood recovery for the New Brighton community is ongoing. The major clean-up is complete and the rebuilding and repair of houses is underway. Continued funding support for those in dire need is required.

Medium Term

Ongoing assistance at the state and federal level is essential to address future planning to minimise the impact of these major flood events.

- Planning instruments that support flood resistant building and design

- Federal support for a Reinsurance scheme

- Finalisation of designs for flood mitigation to support dewatering options in flood events

Long Term

Capital investment at a state level to implement the capital works required to address the root cause of the flooding.

The New Brighton Village Association is combined with and supports the North Byron District Activation committee, and the submission being prepared by that group. This submission combines all of the communities in the northern part of the Byron Shire. NBVA will be adding and supports that submission as a separate document.

On behalf of the New Brighton Village Association

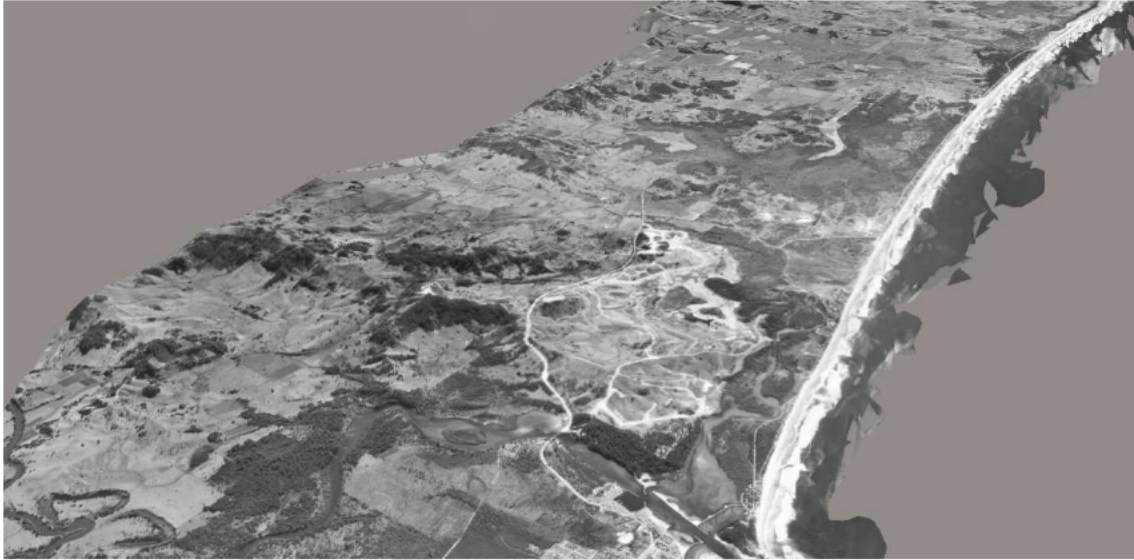
Michael Sherington

14/5/2022

Appendix One

*Review of Historical Changes to the Marshalls Creek Floodplain and
Impacts on Flood Flows _ Robert Crossley*

Review of Historical Changes to the Marshalls Creek Floodplain and Potential Impacts on Flood Flows



Author: Robert Crossley

Contact: robert@wotzhere.com

This document was prepared as a review of various data sources concerning the historical development that may impact flood flows on the Marshalls Creek floodplain.

You may not copy, reproduce, distribute, transmit, modify, create derivative works, or in any other way exploit any part of copyrighted material without the prior written permission from the author.

Acknowledgments and Reference Data

This document is based on personal interpretation of the available aerial imagery since 1947, the stories of the local residents and the reports of scientific studies that have been produced in the past. I do not profess to know all the answers, and am always open to be proven wrong by evidence. This document hopes to progress the conversation in improving the situation.

I would like to acknowledge:

1. the traditional owners of the lands that we live on, the Midgenbul, Bunjalung and Durunbal people, and their elders past, present and emerging. I suspect they would not have got into this mess by thinking that humans could control nature.
2. the government sources of digital data that I heavily rely on in this document, particularly the recently developed historical 3D models of the Marshalls Creek flood plain. These models were produced by the NSW Department of Finance, Services and Innovation by their Spatial Services team, mainly through the vision of Bruce Thompson (RIP).

Links to these models are provided below.

1947: https://s3-ap-southeast-2.amazonaws.com/nsw-reality-models/NorthCoast_Historic/1947a/App/index.html

1971: https://s3-ap-southeast-2.amazonaws.com/nsw-reality-models/NorthCoast_Historic/1971/App/index.html

1987: https://s3-ap-southeast-2.amazonaws.com/nsw-reality-models/NorthCoast_Historic/1987/App/index.html

1991: https://s3-ap-southeast-2.amazonaws.com/nsw-reality-models/NorthCoast_Historic/1991/App/index.html

2004: https://s3-ap-southeast-2.amazonaws.com/nsw-reality-models/NorthCoast_Historic/2004/App/index.html

3. the NSW government historical photo library accessed through <https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f7c215b873864d44bccddda8075238cb#>
4. the government sources of the high resolution LIDAR data that has been collected and collated by GeoSciences Australia: <https://www.ga.gov.au/scientific-topics/national-location-information/digital-elevation-data>
5. The work done by the Floodplain committees over the last decades, and the reports produced.
6. The work done by local citizens in collating historical data and observations. Much of this work is available at:
 - a. <http://brunswickvalley.com.au/flood-history/index.htm>
 - b. http://brunswickvalley.com.au/flood-history/flood_story51.pdf

Robert Crossley

New Brighton Resident.

Key Points

This review is aimed at creating a more complete record of the development on the Marshalls Creek floodplain to ensure that the conversation regarding causes of flooding is based on data, not hearsay.

The review relied mainly on aerial photography interpretation, but also through recollections of long term residents. The original flood flows were interpreted from landscape patterns in 1947 and 1958 photography, and 3D models developed from that photography by NSW government.

A timeline of development on the floodplain is provided based on the evidence from the series of aerial photos available from NSW government spatial portal. These can be downloaded through the links provided in the foreword. Comments on the likely influence on the natural flood flows of development are also provided, but these are personal views only and open to discussion.

Billinudgel

The photos clearly show that the natural flow of water in Billinudgel was via an overflow channel that flowed past the school (now pre-school) to the south of the village, then filled a swamp area before flowing back into Marshalls Creek to the east of the village (through the area that would become the industrial estate).

The development of the industrial estate filled this swamp causing the overflows to back up and increase the flood height in the village. This is backed up by anecdotes from the headmaster at Billinudgel school (1958-1984). Substantial drains were constructed to carry the overflow water through the industrial estate, but any retention storage offered by the swamp area was eliminated by fill in the industrial estate.

The worst flood in Billinudgel was in 2017, and it was thought to have been worsened by blocked drains (I worked there at the time, and they were). Works to clear these drains subsequently may have improved the severity of the flood, as flood heights in 2022 were approximately 30cm lower, whereas the flood levels were much higher in other areas.

South Golden Beach (SGB)/ New Brighton (NB)

The natural flood overflows from Marshalls Creek flowed to a major ocean outfall where SGB Hall is now located. This outlet was close by 1958. This outlet was also fed by waters coming south from Billinudgel Nature Reserve, and would have been expected to have considerable volumes of water discharging from it in its natural state.

There were other ocean outflows evident in aerial photography between Wooyung to New Brighton prior to 1958. There is evidence of an ocean outfall at Wooyung in historical records, and the area is heavily disturbed in a photo from 1962 (possibly by a sand-mining dredge?).

The most prominent ocean outflow was located where the SGB Hall is located today, and this was supported by a well defined network of drainage lines that would have discharged water from both the nature reserve and flood overflows from Marshalls Creek. This was linked to major flood overflow channels that passed through Kolora Way, and which would have diverted flood water from Marshalls Creek to the ocean, thereby reducing flood flows from reaching New Brighton. It also seemed to accept water from channels to the other outflows in the area south.

Other less prominent outflows were located between SGB and NB. These were fed by overflow channels that exited Marshalls Creek downstream of Kolora Way, where New Brighton Road currently floods.

The ocean outfall and these drainage channels in the SGB area were filled in by the SGB development in the late 1950's through to the early 1970's. A bypass canal was also constructed before 1962 through the SGB area that connected Marshalls Creek to the Billinudgel Nature Reserve, which along with fill in the SGB area effectively removed the major ocean outfalls. This meant that flood waters from Marshalls Creek and Billinudgel Nature Reserve were connected, but cut off from the previous natural flows to the ocean.

A man-made canal was constructed to the north of the SGB development between 1971 and 1987 (no aerial imagery was available between these dates for that area), although its location can be seen in the 1987 imagery. This outlet was originally intended to establish a marina by the developers, and was closed in 1976 (<http://brunswickvalley.com.au/>). If there was a natural outfall that existed naturally at this location, it was small and was not supported by any significant drainage network.

While this outlet may have impacted flood flooding in the Billinudgel Nature Reserve and SGB area, given the restricted potential for flow from Marshalls Creek to enter Capricornia Canal from Marshalls Creek (historic overflows have been blocked), any outlet would be unlikely to reduce flooding on Marshalls Creek. It may reduce floodwaters coming into SGB from the north however.

A levee was constructed alongside Redgate Road near the SGB Hall, apparently between 1987 and 1991. This levee constructed to protect SGB from flooding (justifiably) prevent overflow water from Marshalls Creek from flowing north, which was its natural course. The water now ponds behind the levee until it reaches a level that then causes the water to flow back over the Village Green in New Brighton, adding significantly to the flooding. Without this additional water, the peak flood flow would be limited to the capacity of the channel upstream and therefore unlikely to flood the village at all.

None is suggesting that the levee be removed as it protects the SGB village.

Given the changes that have occurred, it would seem that a strategy of removing water that would have naturally gone out of the outflow at South Golden Beach Hall would be an obvious strategy. Opening ocean outflows has been modelled as part of floodplain management studies in 1997 and 2017, but the results suggest minimal improvement on flooding. However, it is likely that flood waters would no longer flow strongly towards these outflow as they did in the past due to fill (see LIDAR model of the area between SGB and NB).

However, it seems that the following strategies would make sense to investigate:





1. Stop pumping water from SGB into the canal, as this will simply recirculate to either Billinudgel Nature Reserve or back in Marshalls Creek, and contribute to the flooding more. This water needs to be pumped out of the system into the ocean, and needs to be supported by well-maintained internal drainage to drain the water to the pumps.
2. Get rid of floodwater that used to flow out of Marshalls Creek into the overflow channels that went into SGB, and take it out the floodplain and into the ocean as it did in the past. This water should not be allowed to pond and flow back to increase the flooding of New Brighton. We need to investigate either (a) the size of the flood pumps that would be


required to reduce flooding, or (b) if drainage channels can be established in the area between SGB and NB to sustain an ocean outfall

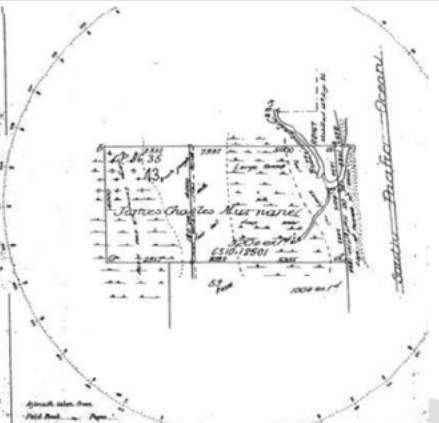
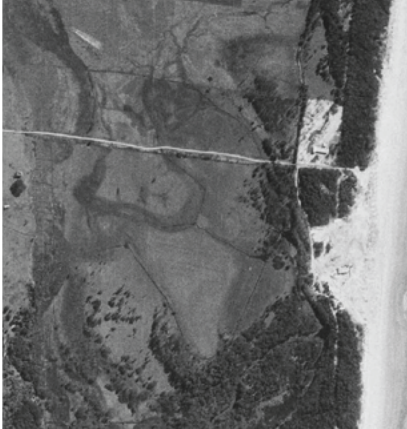

3. Get rid of the floodwater from the Billinudgel Nature Reserve before it overtops the area to the east of Fern Beach and floods SGB. The water needs to be discharged into the ocean and out of the system. Again, what sized flood pump would be required to do this? Could an ocean outfall be constructed to work? There is a call to reinstate the ocean that was created by the developers, but the question remains if the natural drainage channels in the Billinudgel Nature Reserve would deliver sufficient water to this outflow to maintain a natural balance, and whether it would be stable with ocean swells.

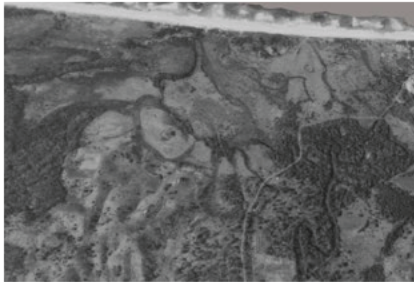
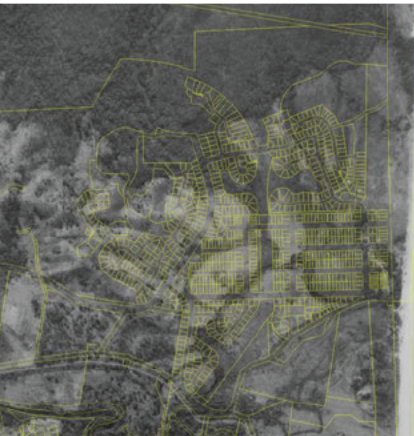


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Timeline





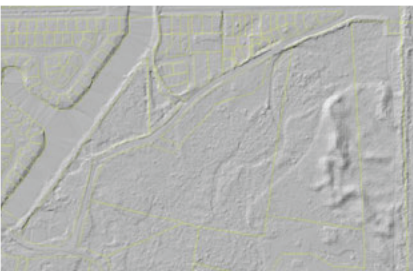
Photo	Event	Impact
BILLINUDGEL		
	<p>Billinudgel 1947</p>	<p>Flood flows in Billinudgel followed a broad overflow channel to the south of the village to a swampy area to the southeast/ east. Water from this swamp then re-joined Marshalls Creek to the east of the old highway.</p>
	<p>Billinudgel 1971</p>	
	<p>Billinudgel 1987</p>	<p>Industrial estate development started to the north of the access road to Billinudgel</p>
	<p>Billinudgel 1997</p>	<p>Bonanza Drive in the Industrial estate developed to a much high level than surrounding areas.</p>


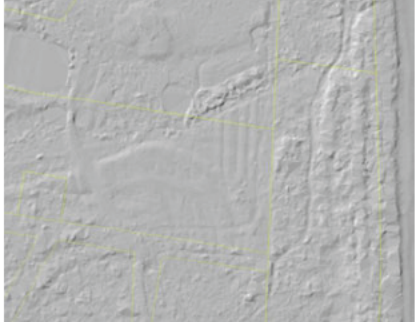
	<p>Modern Terrain Model - Billinudgel</p>	
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<p style="text-align: center;">WOoyUNG</p> 	<p>Original survey plan 1887</p>	<p>Original survey plan shows an ocean outlet at Wooyung, immediately south of the now caravan park. http://brunswickvalley.com.au/flood-history/flood_map3.pdf</p>
	<p>Wooyung 1962</p>	<p>Location where outflow noted previously heavily altered and apparently closed off from the ocean. Sand dredge still present?</p>
	<p>LIDAR data over Wooyung area overlain by Google imagery</p>	<p>Modern LIDAR data exposes the general underlying drainage patterns. This image shows the creek channels in the Wooyung area, and their pattern suggests that there was an ocean outflow in that vicinity at some point.</p>

SOUTH GOLDEN BEACH (SGB) and NEW BRIGHTON (NB)		
	<p>SGB/ New Brighton 1947</p>	<p>Flood flows from Marshalls Creek left the main channel in a couple of locations to flow into well defined channels that then flowed into the ocean through openings in the dunes. The main outfall is located where the SBG shop and Community Hall are now built (not documented in BV). This outfall was also supplied by a major drainage channel coming from the Billinudgel Nature Reserve. Two smaller outflows existed between SBG and New Brighton.</p>
	<p>1947 photo with modern cadastral overlay to locate features.</p>	<p>The location of the main ocean outflow was located where the SGB hall was built.</p>
	<p>Area north of SGB 1958</p>	<p>There was either no significant ocean outflow to the north of SGB where canal was later established, or it was poorly defined. Drainage patterns clearly showed that the dominant channel flowed to an outfall at SGB hall.</p>
	<p>SGB area 1958</p>	<p>Development of the area of SGB commenced between 1947 and 1958, with the major ocean outfall fill in the area to construct what would later become the SBG blocks closest to the beach. This was probably the area used for an airfield by the American developers at the time. The photo clearly shows the location of the major drainage channel ending at the developed area. Overflow channels are still apparent where Kolora Way is not located.</p>

	<p>Area between SGB and NB 1958</p>	<p>It is unclear if the ocean outfalls between SGB and NB were still open in 1958, but the drainage channels were still well defined.</p> <p>Drainage channels from overflow from Marshalls Creek through Kolora way less well defined, possibly with the construction of the canal?</p>
	<p>SGB area 1962</p>	<p>Further development of the SGB area was evident by 1962, including a motel. A quarry established at Seventh Day Adventist Church site. Channels at SGB filled. Capricornia Canal was extended through the area to link to the Billinudgel Nature Reserve.</p>
	<p>Area between SGB and NB 1971</p>	<p>Drainage channels to ocean outfalls between SGB and NB are less well defined, and do not appear to have a clear channel through the dunes.</p> <p>Similarly for overflow channels through the Kolora Way area.</p>
	<p>Area north of SGB 1971</p>	<p>In 1971, there was no evidence of an ocean outflow to the north of SGB.</p>

	<p>SGB area 1987</p>	<p>The 1987 photos show considerable development of the canal and housing. It is unclear if the levee was constructed at this time.</p>
	<p>Kolora Way 1987</p>	<p>Any evidence of the major overflow channels from Marshalls Creek through the Kolora Way area are no longer evident.</p>
	<p>Area north of SGB 1987</p>	<p>A man-made canal is clearly shown in 1987, although it is not connect to the ocean at this time.</p>
<p>1991</p>		
	<p>SGB Hall area 1991</p>	<p>By 1991, the levee stopping any northward flow of water from Marshalls Creek into SGB was constructed.</p>
	<p>Terrain Model of levee at SGB</p>	<p>A detailed terrain model created by LIDAR shows the levee system that prevents water flowing from Marshalls Creek into the SGB area.</p>

 A grayscale terrain model showing a road network and a creek. The road Kolora Way runs vertically, and Marshalls Creek flows from the top right towards the center.	<p>Terrain Model Kolora Way</p>	<p>Fill in Kolora Way prevents overflow water from Marshalls Creek from flowing north.</p>
 A grayscale terrain model showing a coastal area with a grid of yellow dashed lines. The terrain is relatively flat with some subtle depressions.	<p>Terrain Model - area between SBG and NB</p>	<p>Ocean outfalls in the area between SGB and NB were fed by distinct drainage channels across the floodplain. These channels and outflows have been altered by sand mining and fill brought in by property owners. The effectiveness of any reconstructed outflow through the dunes would be restricted by the removal of these channels.</p>

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