

Direction 7: Activated places and spaces

Our safe and accessible public places and spaces support our social, emotional and physical wellbeing.



There is a large and growing body of knowledge that confirms the importance of activated social places and community connectedness to our wellbeing and resilience. For example, a decade of research by the Australian Unity Wellbeing Index (2020) demonstrates a strong correlation between the wellbeing of people and the sense of community, belonging and social opportunities where they live. Having a sense of 'being connected' to people and places in meaningful ways is especially important to young people as they seek stability, balance and identity at a time of great personal transformation and growth.

As we are facing a mental health crisis and emerge from multiple lockdowns the need for activated places and spaces are more urgent than ever and critical to our individual wellbeing and collective resilience.

Our Arts and Creativity Strategy (2021f) recognises the fundamental importance of the arts and creativity to the Northern Beaches way of life and the wellbeing of its community and considers active, vibrant places integral to our mental health.

Our Community Centre Strategy (2021g) creates a vision for a network of multipurpose centres that are attractive spaces for our community. At the core of this is accessibility, with good connections to public transport and affordable rates for hire. Council is committed to delivering inclusive community centres that embrace diversity and are available and inviting to all ages, cultures and abilities.

This Direction builds on this Strategy in providing focussed direction for making sure our public places and spaces cater for a wide range of needs and interests in supporting our wellbeing.

Designs should reflect and integrate the diversity of the community that they're serving and ensure there is access to services.

(SRG Workshop participant)

“ ”

Key Priorities

Key Actions

1. Create environments that connect us to place and to each other, enriching our community and sense of belonging	1a. Continue to undertake the initiatives within Council's Creative Arts Strategy (2021f) to cultivate creativity, identify opportunities for arts and cultural expression and connect our diverse communities (S,M,O)
2. Our community has access to places and spaces that inspire creativity and connection	1b. Continue to hold a diverse range of public events that activate and increase vibrancy of public spaces, provide economic benefits to local business and bring the community together in line with Council's Events Strategy (2018c) (O)
3. Places and spaces are designed to promote accessibility and inclusion and cater to the varying needs of our community	2a. Investigate options to increase opportunities for our community to access places that encourage and inspire creativity and connection
4. Celebrate our cultural heritage through creative expression in public places and spaces	3a. Continue to deliver on the actions within Council's Community Safety Plan (2021e) and Disability Inclusion Action Plan to create safe and accessible places for our community (S,O)
5. Facilitate active and passive recreation to improve the physical and mental wellbeing of our community	4a. Increase opportunities to recognise our diverse cultural identities in public spaces in alignment with Council's Public Space Vision & Design Guidelines (2021h) (O)
	5a. Prepare an Open Space and Recreation Strategy that embeds resilience as a core principle and acknowledges the importance of quality, safe, accessible and inclusive open space and its contribution to the physical and social wellbeing of our community (S)

Links to Existing Plans and Strategies



Implementing the Strategy

The Strategy will be supported by the Resilience Action Plan which will articulate the full spectrum of projects and actions that Council will undertake to deliver the key priorities in this document and drive us towards achieving resilience outcomes. The Action Plan will also establish a range of key indicators to monitor and evaluate progress of key actions and their effectiveness to achieving the Strategy outcomes and priorities.

We will aim to deliver the Strategy and Action Plan within existing resources in line with the Long Term Financial Plan.

However, we will seek opportunities to leverage external sources of funds where possible. Evaluation on our progress against the outcomes, priorities and actions will be undertaken on an annual basis in accordance with the Integrated Planning and Reporting Framework (refer Figure 23).

A detailed assessment, report and review will be completed every four years. This will allow us to adapt the priorities and actions in order to be adaptive to changes in our community, knowledge, technology, science as well as federal and state policies.

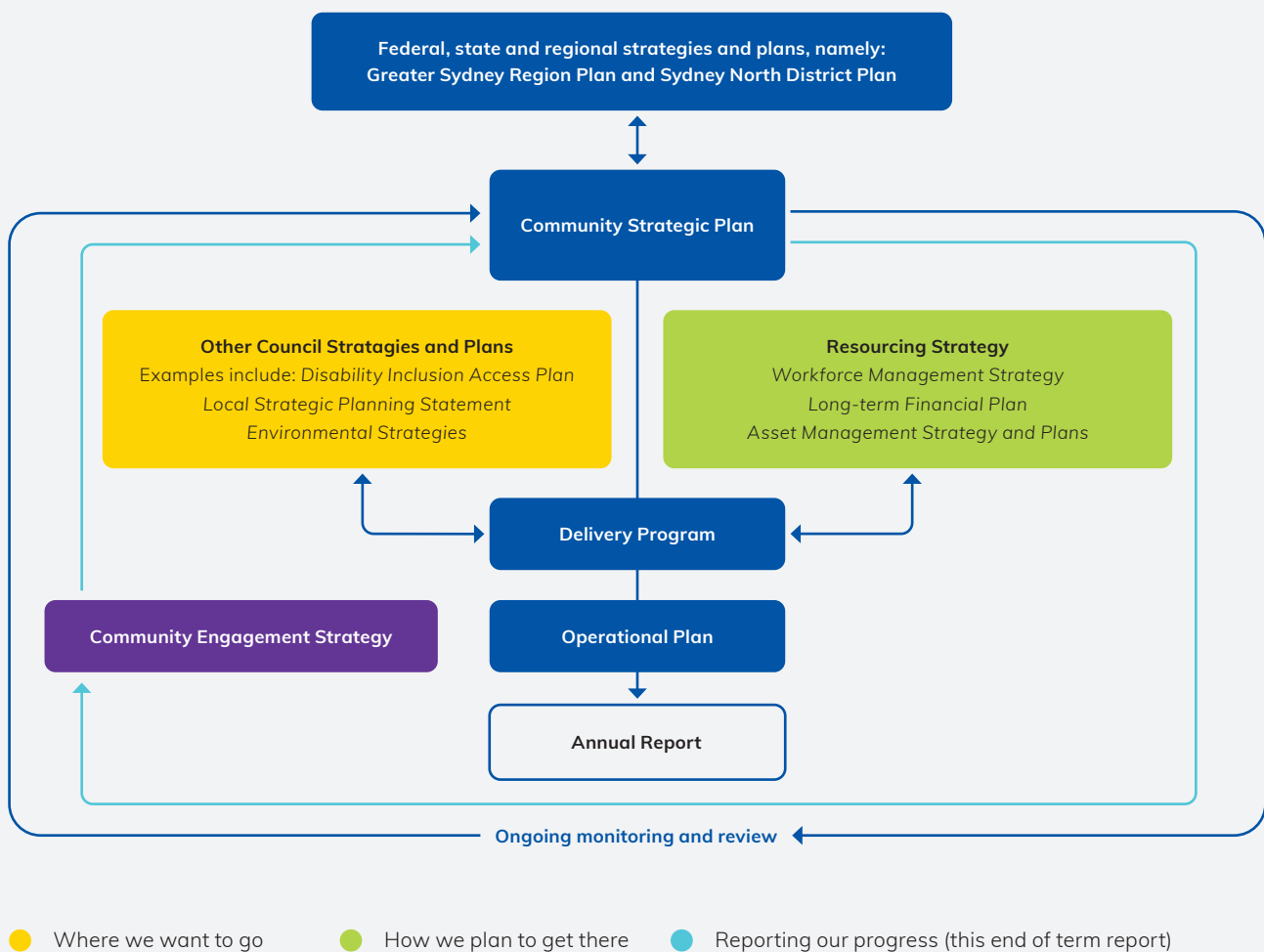


Figure 23 - Integrated Planning and Reporting Framework

Everyone has a role to play to increase our collective resilience as a community. We will work closely with our community and stakeholders to deliver on the priorities within this Strategy to empower the Northern Beaches community to **Withstand, Adapt and Thrive.**



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Appendix A

Summary of the risk profile for the shocks and stresses

Council continuously monitors and manages a broad range of risks as an integral part of our operations. For the purposes of defining the Key Directions, priorities and actions for this Strategy, a summary of shocks and stresses is provided in the following summary. This also include an indicative assessment of the risks of highest concern and greatest relevance to the Northern Beaches, given our geographic, social, economic, and environmental characteristics.

Some communities will have a higher or lower rating of risk depending on their exposure to a particular shock.

This section also provides indication of levels of community concern, based on the engagement outcomes. It's important to note these results do not reflect the capability of our community service providers, rather they are an indication of how our community perceives the gravity of the issue.

In partnership with key stakeholders, agencies and emergency services, Council continues to assess and monitor these and other risks on an ongoing basis using rigorous systems and processes that enable timely mitigation and management.

Shock profiles

Disease pandemic

While COVID-19 naturally dominated discourse about pandemics, worldwide there is an increase in a broad range of infectious diseases. This reflects the combined impacts of rapid demographic, environmental, social, technological and other changes to our way of living.

Since European settlement, Australia has experienced a number of pandemics such as the Smallpox, Spanish flu, Polio, H1N1 Influenza and Swine Flu etc some of which resulted in significant mortality and morbidity rates.

Epidemics such as Measles, Scarlet Fever, Whooping Cough, Chicken Pox and Mumps have significantly impacted the community. However, the implementation of vaccination programs have significantly reduced the prevalence and risk of serious illness and death over time.

The general consensus from international health experts is that there is an ever-increasing risk of pandemics noting the Indo-Pacific region's climate, distributional pattern of species richness, and rapid urbanisation which will propel zoonotic diseases, vectorborne diseases and drug resistant diseases.

This reflects the combined impacts of rapid demographic, environmental, social, technological and other changes in our ways of living. Climate change will also affect infectious disease occurrence (WHO, 2003).

While Australia's relatively low population density and geographic isolation are strong mitigative factors that reduce the prevalence and spread of infectious disease, our ever increasing international connectedness through trade and travel, means that risk cannot be completely removed.

Though the Northern Beaches is relatively well placed to deal with infectious diseases, there are a range of significant cascading effects across social, financial and political impacts that affect the community. These may affect the community disproportionately, with some demographic groups being more affected than others either directly in terms of impacts on health and wellbeing, or indirectly such as in terms of financial impacts. Vulnerable groups include elderly people, children, essential workers, and people from lower socio-economic backgrounds.

Analysis	Rating
Community concern	High (Concerned or very concerned - 36%)
Perceived level of community preparedness	High (Prepared or very well prepared - 43%)
Likelihood	Unlikely
Consequences	Major ⁴
Overall risk	High ⁴
Risk trend (+ 30 years)	Potential increase driven by climate related changes and increased global populations
Communities at highest risk	Whole of community

⁴ Risk assessment undertaken prior to COVID-19 pandemic

Bush fire

Bush fires are an intrinsic part of Australia's environment. Natural ecosystems have evolved with fire, and the landscape, along with its biological diversity, has been shaped by both historic and recent fires. Aboriginal and Torres Strait Islander peoples have long used fire for hunting, cultural ceremony and regeneration.

Many of Australia's native plants are fire prone and very combustible, while numerous species depend on fire to regenerate. Hazard reduction burning continues to be used to clear land for agricultural purposes and to protect properties from intense and uncontrolled fires.

As shown Figure 23, a significant proportion of the Northern Beaches are classified as bush fire prone land within the Northern Beaches. This includes 19,000 properties, National Park, Crown and Council owned land.

The region is at significant threat from bushfire given the large areas of bushland adjoining the urban interface, and the impacts from ember attack on areas well away from the fire front. Areas of high risk are Duffys Forest, Terrey Hills, Ingleside, Narrabeen, Cromer, Cottage Point, Belrose and Oxford Falls and the offshore communities of Pittwater.

While properties in these areas are directly affected by bush fire risks, the wider community are also both directly and indirectly affected in terms of risks to health, critical infrastructure, mobility, and intrinsic values. Bush fires pose significant risk to ecological and natural values, which are considered of fundamental importance to the wellbeing of the community.

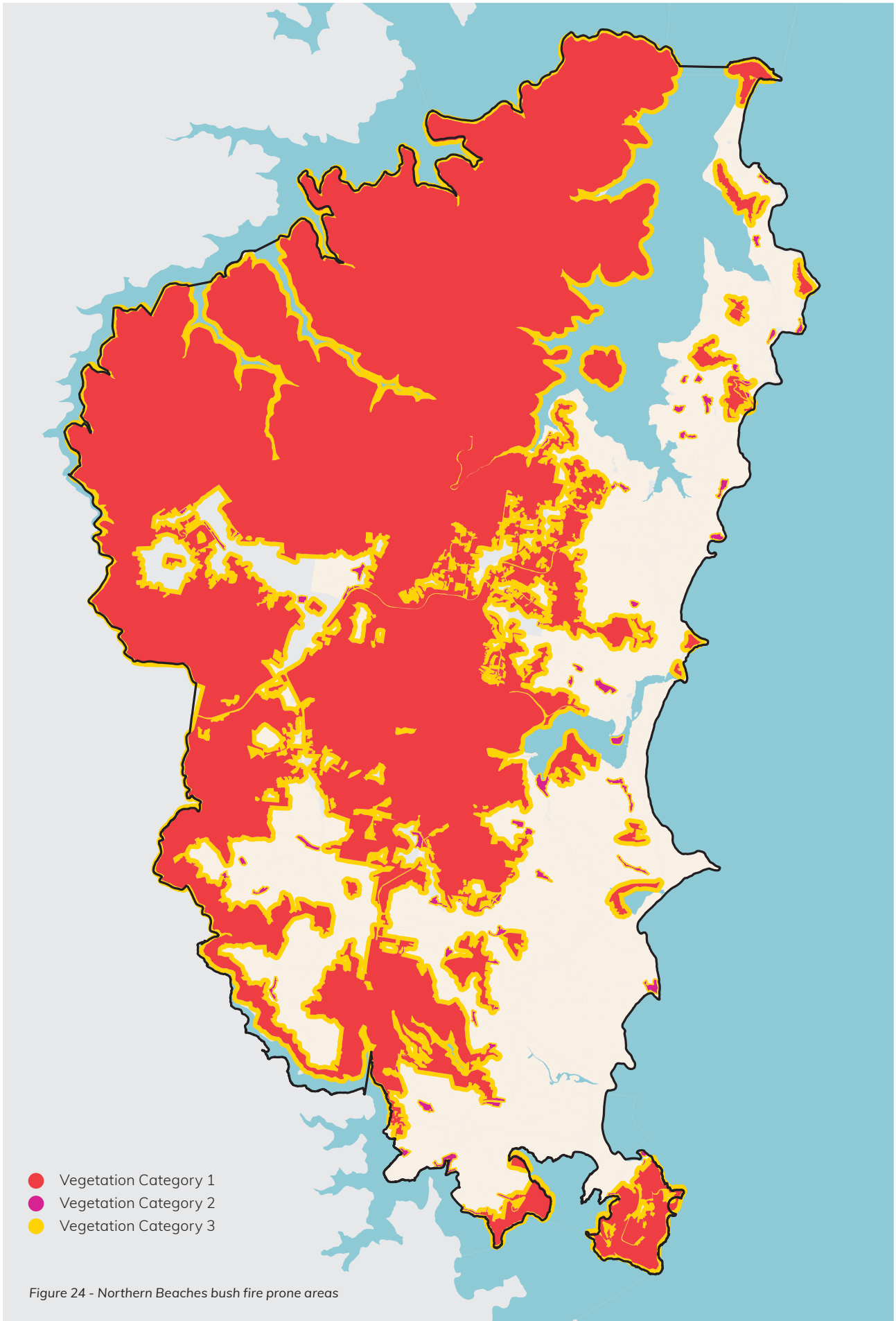
Climate change is a key driver for increased bush fire risk, with long-term trends showing a 10-15 percent reduction in rainfall in recent decades in south-eastern Australia, largely driven by a lack of wet years, or wet months, since the mid-1990s (BoM, 2020). This change has been most significant in the cool season (April-October). Projections also indicate that droughts in southern Australia are likely to last longer and be more intense (Ukkola et al, 2018).

The BoM also explained that NSW is seeing an increase in annual mean sea level pressure over time. Higher pressures mean reduced rainfall and cloudiness which lead to increased landscape dryness, and the drying trend is especially strong in spring (Bureau of Meteorology, 2020).

Analysis	Rating
Community concern	High (Concerned or very concerned - 32%)
Perceived level of community preparedness	High (Prepared or very well prepared - 36%)
Likelihood	Likely
Consequences	Major
Overall risk	Extreme
Risk trend (+ 30 years)	Potential increase driven by climate related changes such as increased long term climate temperatures, and increased intensity, duration and frequency of drought and heatwave conditions
Communities at highest risk	Duffys Forest, Terrey Hills, Ingleside, Narrabeen, Cromer, Cottage Point, Belrose and Oxford Falls and the offshore communities of Pittwater.

- Vegetation Category 1
- Vegetation Category 2
- Vegetation Category 3

Figure 24 - Northern Beaches bush fire prone areas



Storms (inc. coastal erosion and inundation)

Severe storms can happen anywhere and generally occur more often than other natural hazard events. These range from localised storms that affect only a small area, to powerful low-pressure systems such as East Coast Lows that can affect an area spanning thousands of square kilometres.

Severe storms can produce hail, strong winds, heavy rainfall, flash floods and storm tides. Climate change is associated with potential large increases for short-duration rainfall extremes, with larger uncertainties for extreme winds, tornadoes, hail and lightning.

Storms in New South Wales cause greater losses to local communities than any other single hazard. Storms can happen anywhere at any time of the year and be any combination of strong winds, heavy rain, hail and lightning.

As a result, storms can pose a significant safety risk to people and animals. Potential hazards include flying debris, falling trees, large hailstones, lightning strikes and fast-moving floodwaters.

Severe storms can remove roofs from buildings, break windows, damage vehicles, bring down powerlines disrupting electricity supply and cause flash flooding.

Storms may also restrict people or vehicles from moving around safely during and after the event.

Coastal erosion is a significant risk along the entire eastern shoreline and especially in known erosion hot spots including Collaroy-Narrabeen Beach, Bilgola Beach, Basin Beach at Mona Vale and Great Mackerel Beach.

Under climate change scenarios, it is expected that this risk will intensify both in frequency and magnitude and will affect the whole of the Northern Beaches community (e.g. through compounding risks such as infrastructure, utilities and communications failure).

Despite the recent lived experiences of coastal erosion, community concerns with storms, floods and coastal inundation were relatively moderate, at 30 percent concerned or very concerned, - only 8 percent were very concerned and similar perceived levels of preparedness (30%).

Council undertakes a number of operations in order to reduce the effects of erosion including maintaining the protective vegetation on sand dunes, constructing and maintaining properly designed seawalls, as well as undertaking beach scraping and nourishment.

Analysis	Rating
Community concern	High (Concerned or very concerned - 30%)
Perceived level of community preparedness	High (Prepared or very well prepared - 29%)
Likelihood	Likely
Consequences	Moderate
Overall risk	High
Risk trend (+ 30 years)	Potential increase driven by climate related changes such as increased storm intensity and frequency
Communities at highest risk	Whole of community



Floods

Flooding occurs most commonly from heavy rainfall when natural watercourses and the stormwater system do not have the capacity to carry excess water. Flooding can also be caused or exacerbated by storm surge as a result of an east coast low, tropical cyclone or a high tide coinciding with higher than normal river levels (Geosciences Australia, 2021).

Other factors which can contribute to flooding include:

- volume, spatial distribution, intensity and duration of rainfall over a catchment
- the capacity of the watercourse or stream network to carry runoff
- catchment and weather conditions before rainfall
- ground cover
- topography
- tidal influences.

Over 22,000, or one in five properties have some degree of flood risk in the LGA (Refer Figure 24). There are three main types of flood risk, varying by location

type, which may require emergency evacuation and road closures, including:

- Overland flow (flash flooding) risk from large rain events is present in urbanised areas with high impervious surfaces and steeper terrain which concentrate water flows, such as Mona Vale, Avalon, Newport, Brookvale, Beacon Hill, Forestville, Davidson and Belrose.
- Mainstream creek and lagoon flood risk from large rain events is present in low lying (floodplain) suburbs, often in areas associated with coastal lagoons and wetlands, such as Warriewood, Narrabeen Lagoon, South Creek (including Cromer), Dee Why Lagoon, Curl Curl Lagoon, and Manly Lagoon. A number of key arterial roads including Wakehurst Parkway, Condamine Street and Pittwater Road are flood affected and require specific consideration regarding closure and traffic diversion.
- Tidal inundation risk from increased ocean levels is possible within open waterways such as Pittwater and Middle Harbour, potentially affecting foreshore properties.

Analysis	Rating
Community concern	High (Concerned or very concerned - 30% based on storm)
Perceived level of community preparedness	High (Prepared or very well prepared - 29% based on storm)
Likelihood	Possible
Consequences	Major
Overall risk	High
Risk trend (+ 30 years)	Potential increase driven by climate related changes such as increased storm intensity and frequency
Communities at highest risk	Mona Vale, Avalon, Newport, Brookvale, Beacon Hill, Forestville, Davidson and Belrose Narrabeen Lagoon, South Creek (including Cromer), Dee Why Lagoon, Curl Curl Lagoon, and Manly Lagoon

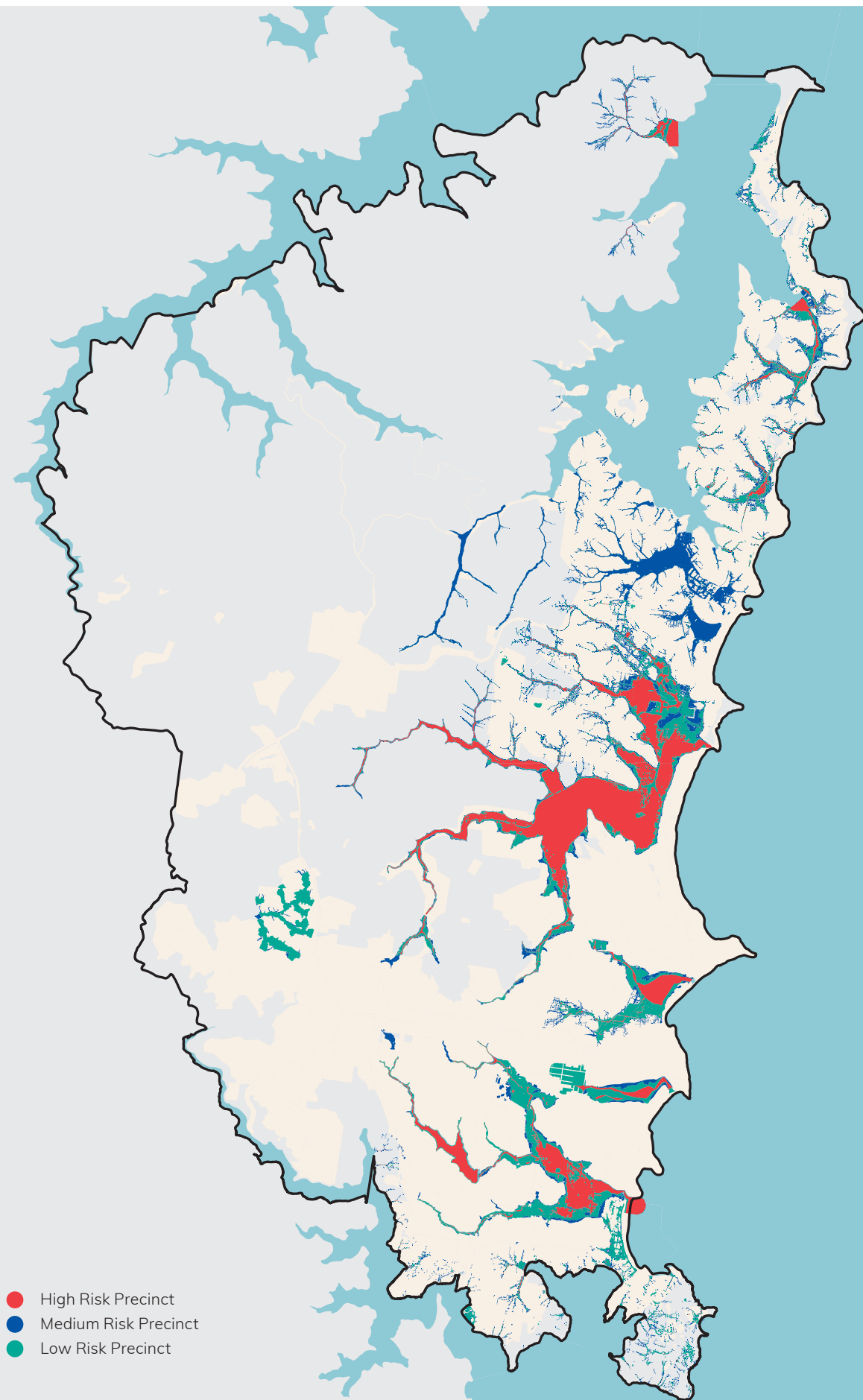


Figure 25 - Northern Beaches flood prone areas

Utilities and infrastructure failure

Utilities and infrastructure such as water, sewer, energy and communications services are critical in our everyday lives. The consequences of infrastructure failure can be severe, particularly if compounded with other risk factors. For example, energy failure during heatwaves may have significant health repercussions through loss of opportunity to cool homes, and this may especially affect vulnerable groups such as the aged.

For the Northern Beaches, there are particular infrastructure vulnerabilities relating to chronic stresses that may affect some areas more than others. Areas such as the northern part of the LGA and offshore communities are especially vulnerable to cascading impacts of utilities and infrastructure failure due to the combination of restricted transport routes, relatively limited access to hospitals, and an ageing population.

The community expressed a relatively high level of concern with potential infrastructure failure, with 52 percent of online survey respondents stating concern or very high concern (the phone survey showed lower perceived levels of concern, at 30%). Preparedness levels were similar across the two surveys, at 16 percent and 19 percent respectively.

Analysis	Rating
Community concern	High (Concerned or very concerned - 30%)
Perceived level of community preparedness	Low (Prepared or very well prepared - 19%)
Likelihood	Possible
Consequences	Moderate
Overall risk	High
Risk trend (+ 30 years)	Potential increase driven by climate related changes such as increased intensity and frequency of storm and bushfire events
Communities at highest risk	Whole of community

Digital Network Failure

All cities are becoming increasingly dependent on information and communications technology (ICT). This ranges from the daily use of emails, smart phones and online retail trade through to the running of systems for critical services such as air traffic control and banking transactions.

Failure of ICT backbone systems would significantly compromise Sydney's economy. Such an event was experienced in Sydney in February 2016 when Telstra, Australia's largest telecommunications provider, suffered a mass service disruption to millions of customers. The impact included significant loss of productivity for businesses (Resilient Sydney, 2016).

Analysis	Rating
Community concern	High (Concerned or very concerned - 30%)
Perceived level of community preparedness	Low (Prepared or very well prepared - 18%)
Likelihood	Possible
Consequences	Moderate
Overall risk	High
Risk trend (+ 30 years)	Potential increase with increased reliance and interdependency on digital networks
Communities at highest risk	Whole of community

Cyber attack

Cyber attack is the deliberate act through cyberspace to manipulate, disrupt, deny, degrade or destroy computers or networks, or the information resident on them, with the effect of seriously compromising national security, stability or economic prosperity (ACSC, 2021).

Cyber attack may include:

- Ransomware - malicious software that makes data or systems unusable until the victim makes a payment.
- Phishing - untargeted, mass emails sent to many people asking for sensitive information (such as bank details), encouraging them to open a malicious attachment, or visit a fake website that will ask the user to provide sensitive information or download malicious content.
- Data breach - the unauthorised movement or disclosure of sensitive private or business information.
- Hacking - the unauthorised exploitation of weaknesses in a computer system or network.
- Insider threat - is a security risk that originates within the targeted organization

Examples of recent cyber attacks include:

- Australian National University in 2018 involving the access of sensitive information of over 200,000 students,
- Service NSW in 2020 where 47 staff email accounts were hacked and led to 50 million documents being accessed containing sensitive data. This event impacted 104,000 people.
- Bureau of Meteorology in 2015 where foreign entities installed malicious malware resulting in the release of sensitive information. It was estimated cost to rectify ran into the hundreds of millions of dollars.

The threat of cyber attack is increasing across all levels of our community including individuals and families, small and medium business, large organisations and infrastructure and government. Revenue for the online shopping industry surging by 21.8% in March 2020, highlighting the trend of a strong transition to digital markets accelerated due to the COVID-19 pandemic (Department of Home Affairs, 2020).

Cyber attack targeting small, medium and large Australian businesses has been estimated to cost the economy up to \$29 billion per year, or 1.9% of Australia's gross domestic product (Department of Home Affairs, 2020).

Analysis	Rating
Community concern	High (Concerned or very concerned - 29%)
Perceived level of community preparedness	Low (Prepared or very well prepared - 16%)
Likelihood	Variable
Consequences	Variable
Overall risk	Variable
Risk trend (+ 30 years)	Likely increase with increased reliance on digital systems
Communities at highest risk	Whole of community

Financial institution failure

Financial institution failure is characterised as the failure of core financial mechanisms or institutions (such as a big four bank or major insurer) has the potential to seriously degrade the functionality of Sydney's economy.

Sydney has demonstrated resilience to global financial crises such as the 2007 Global Financial Crises, but the likelihood and consequence of another crisis remains high.

In 2001, Australia's second largest insurance company HIH collapsed. This was the largest corporate collapse in Australia's history with liquidators estimating losses totalling of \$5.3 billion (Resilient Sydney, 2016).

The introduction of cryptocurrencies has also increased risk uncertainties particularly given that digital markets may not be regulated by the Australian Securities and Investments Commission.

Analysis	Rating
Community concern	Low (Concerned or very concerned - 23%)
Perceived level of community preparedness	Moderate (Prepared or very well prepared - 21%)
Likelihood	Variable
Consequences	Variable
Overall risk	Variable
Risk trend (+ 30 years)	Variable
Communities at highest risk	Whole of community

Heatwaves

A heatwave occurs when the maximum and the minimum temperatures are unusually hot over a three-day period.

Heatwaves are a significant hazard in Australia for people and the environment and have been responsible for more human deaths than any other natural hazard, including bushfires, storms, tropical cyclones and floods (DPIE, 2021).

Heatwaves can be dangerous because they pose health risks to the most vulnerable, such as elderly people and very young children.

While direct risks to health and wellbeing may be moderate, high temperatures may have broader community effects and compounding risks through impacts on transport, energy and associated infrastructure and may cause a range of cascading effects including blackouts. It may also accelerate the ageing of infrastructure.

The Northern Beaches is projected to experience 11 additional hot days (over 35°C) per year by 2070.

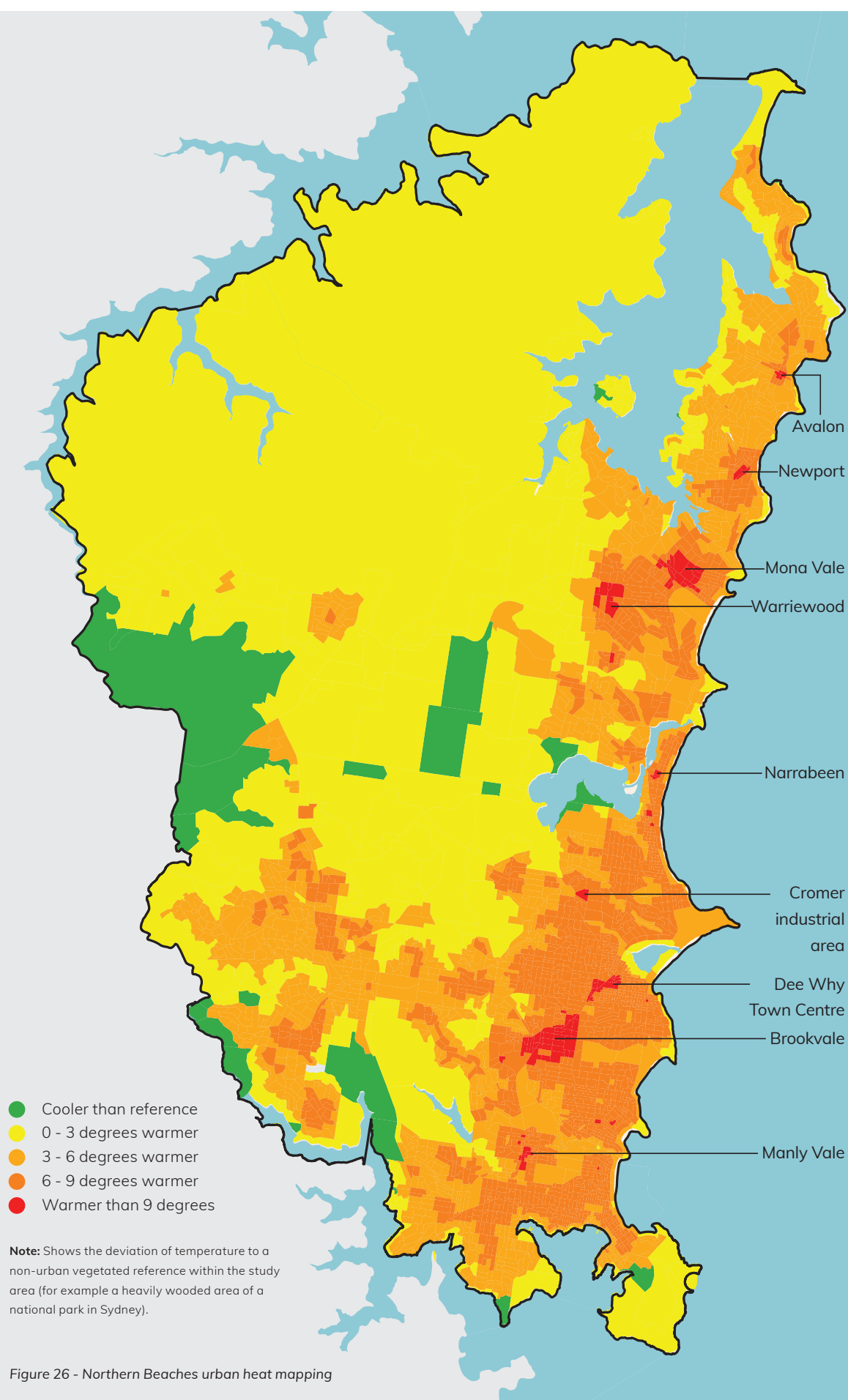
- The number of extreme heat days in Sydney are set to rise from an average of 3 to 11 per year

- By 2030, there is projected up to 10 more heatwave days per year and by 2070 up to 33 more in the north of NSW. In the south, there is projected up to 7 more days.

While the climate is heating and increases in frequency and duration of heatwaves projected to increase, the Northern Beaches is better placed in comparison to other parts of Sydney to handle the effects of a heatwave, as a result of a proximity to the ocean both in terms of accessibility and the cooling effects of the ocean breeze.

Furthermore, our region has a high level of green cover which can assist to mitigate the effects of urban heat. Compared to other areas of the LGA, Figure 25 illustrates areas within the Northern Beaches that have areas such as Dee Why and Brookvale are at relatively higher risk to the effects of heatwaves due to higher density and urban development. People most at risk include elderly people, infants and children, and people living with chronic illnesses such as respiratory illnesses or heart conditions.

Analysis	Rating
Community concern	Low (Concerned or very concerned - 22%)
Perceived level of community preparedness	Low (Prepared or very well prepared - 20%)
Likelihood	Likely
Consequences	Major
Overall risk	Extreme
Risk trend (+ 30 years)	Potential increase driven by climate related changes such as increased intensity and frequency of heatwave conditions.
Communities at highest risk	Whole of community, particularly the elderly and young children.



Water Crisis

Water crisis can be attributed to a number of causes including:

- Drought - a prolonged, abnormally dry period when the amount of available water is insufficient to meet our normal use.
- Contamination - due to the introduction of chemical or biological matter that renders the supply not fit for consumption.

The Sydney Water giardia outbreak in 1998 resulted in a week of Sydney-wide “boil water” alerts affecting up to three million residents. This led to the establishment of Sydney Catchment Authority to manage bulk water supply.

Over the coming decades, Sydney can expect lower average rainfall and higher temperatures, which will result in less runoff and lower drinking water yields (Resilient Sydney, 2016).

Drought conditions reduce the amount of available water, however as a secondary impact water quality can also be significantly impacted.

A desalination plant located at Kurnell was completed in 2010 that aims to meet water demand during prolonged drought. Whilst this plant does not supply water to the Northern Beaches, it supplements existing water supply across the metropolitan area.

Analysis	Rating
Community concern	Low (Concerned or very concerned - 21%)
Perceived level of community preparedness	Moderate (Prepared or very well prepared - 26%)
Likelihood	Possible
Consequences	Moderate
Overall risk	High
Risk trend (+ 30 years)	Potential increase driven by climate related changes increasing the potential for extended drought conditions.
Communities at highest risk	Whole of community

Landslides/Rockfall

A landslide is the movement of a mass of rock, debris or earth down a slope

Landslides have two things in common - they are the result of failure of the soil and rock materials that make up the hill slope and they are driven by gravity. They can vary in size from a single boulder in a rockfall or topple to tens of millions of cubic metres of material in a debris avalanche.

The Northern Beaches area has significant landslide areas that exist on both public and private lands with approximately 63,000 properties are tagged as being of moderate to high-risk landslide potential.

Risk of landslide is generally greater during and after significant rainfall and is further increased after extended dry periods. Other site specific or isolated failures may occur due to root jacking or soil saturation.

Landslides can be triggered by natural causes or by human activity.

Natural causes include:

- saturation of slope material from rainfall or seepage;
- root jacking caused by roots of trees growing on rock cut batters grow into defects and joints within the rock mass;
- vibrations caused by earthquakes, volcanic eruptions;
- undercutting of cliffs and banks by waves or rivers etc.

Human activity may include:

- the removal of vegetation;
- interference with or changes to natural drainage;
- leaking pipes (water, sewer);
- the modification of slopes by the construction of roads, railways or buildings;
- mining activities;
- vibrations from heavy traffic or blasting; or the displacement of rocks etc (Geosciences Australia, 2003)

Analysis	Rating
Community concern	Not rated
Perceived level of community preparedness	Not rated
Likelihood	Possible
Consequences	Moderate
Overall risk	High
Risk trend (+ 30 years)	Potential increase driven by climate related changes such as increased storm intensity and frequency.
Communities at highest risk	Communities located in geotechnical risk areas.

Tsunami

Tsunami is a Japanese word that translates as ‘harbour wave’ and is characterised as a large flooding body of water typically in the form of a series of waves that can significantly impact structures and people through the direct contact and continue to rush into land for an extended period of time (AIDR, 2014).

Tsunamis are usually associated with earthquakes, volcanic eruptions and landslides, which can cause a sudden movement of the water column in the ocean, and create fast-moving waves.

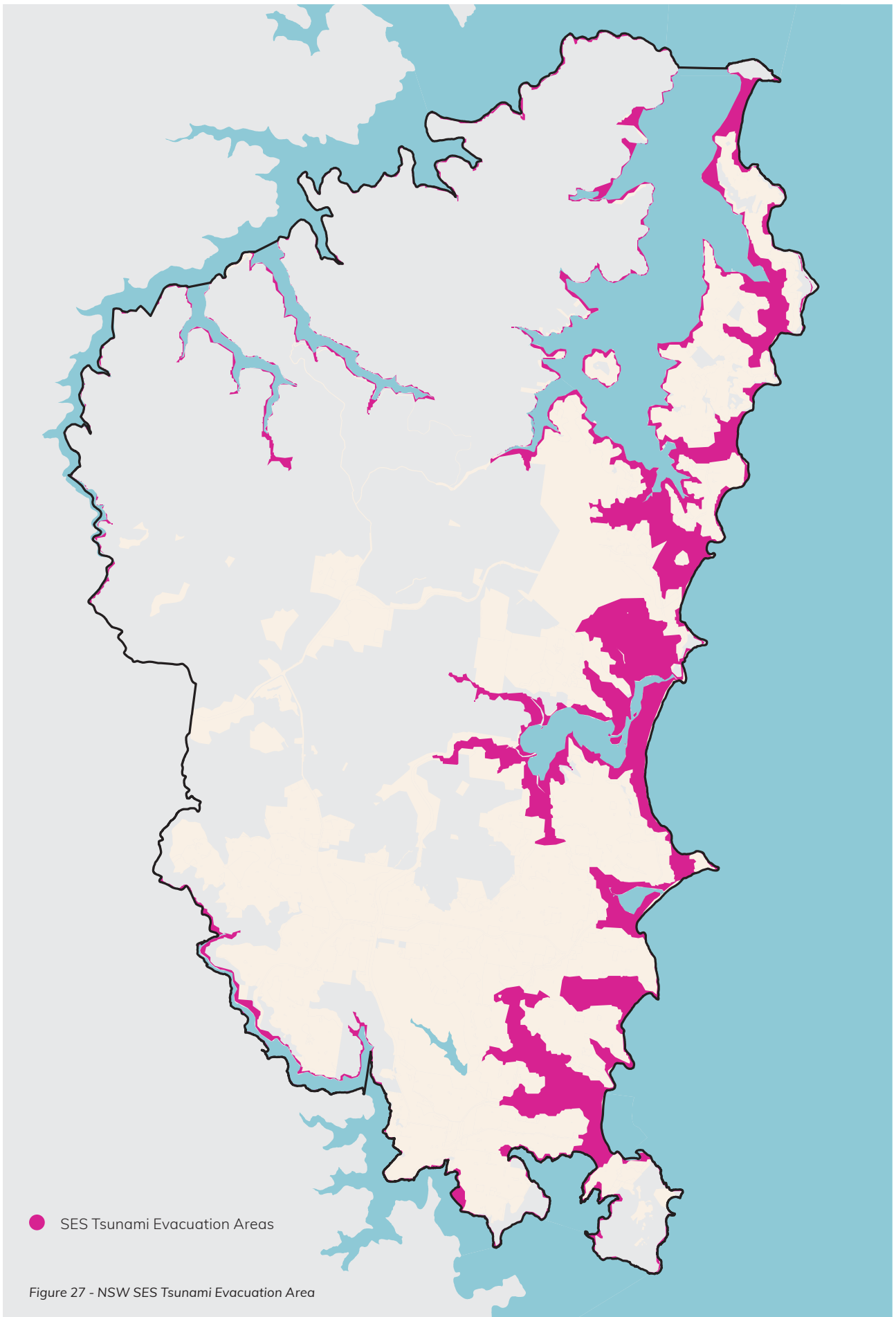
While the likelihood of a land-threat tsunami on the east coast of Australia is low, estimates that a large tsunami impacting the entire NSW coast would directly threaten between 250,000 and 1.5 million people, depending on the magnitude of the tsunami, time of day and season (State Emergency Management Committee, 2018). There is no record of a land-threat tsunami in Australia since European settlement (NSW SES).

Marine-threat tsunamis occur once about every six years, however are usually only dangerous to swimmers and boaters because of the dangerous currents they create.

As illustrated on the NSW SES Tsunami Evacuation map Figure 26 low-lying areas around coast and waterway on the Northern Beaches are at risk. The Manly central business district is one of the highest risk areas as it is subject to inundation from both directly from the ocean and harbour (Wilson, K.M et al, 2018).

The 1960 Chilean tsunami caused by a magnitude-9.2 earthquake, damaged boats in harbour on NSW’s coast from Evans Head, Newcastle, Sydney and Eden. The Fort Denison tide gauge in Sydney Harbour recorded wave heights up to 84cm (Goff et al, 2016). The image above shows the extensive erosion at Clontarf Beach caused by this event (NSW SES).

Analysis	Rating
Community concern	Not rated
Perceived level of community preparedness	Not rated
Likelihood	Unlikely
Consequences	Major
Overall risk	Medium
Risk trend (+ 30 years)	Limited change
Communities at highest risk	Whole of community, particularly low-lying areas along the coastline under 10m AHD.



Earthquake

Earthquakes are the vibrations of the Earth caused by the passage of seismic waves radiating from some source of elastic energy (AIDR Glossary).

Since Australia is situated on the Indian-Australian tectonic plate, it does not experience earthquakes as severe as those occurring at tectonic plate boundaries. The main hazard is the resulting ground shaking that can damage or destroy infrastructure and threaten lives (Geoscience Australia 2019).

Australia's largest recorded earthquake was in 1988 at Tennant Creek in the Northern Territory, with an estimated magnitude of 6.6. It occurred in a sparsely populated area and resulted in damage to a major gas pipeline. A magnitude 6.5 earthquake at Meckering in 1968 caused extensive damage to buildings and was felt over most of southern Western Australia. These earthquakes are two of the eleven that are recorded to have produced surface rupture in historical times, forming fault scarps (Geosciences Australia, 2021).

In December 1989, Newcastle was devastated by an ML 5.6 (Richter magnitude) earthquake. This was one of the most serious natural disasters in Australia's history.

The earthquake claimed 13 lives: 9 people died at the Newcastle Workers Club, 3 people were killed in Beaumont Street Hamilton, and one person died of shock.

This event resulting a range of significant impacts including:

- 160 people were hospitalised
- 50,000 buildings were damaged (approximately 40,000 of these were homes)
- 300 buildings were demolished
- 300,000 people were affected and 1,000 were made homeless
- It left a damage bill estimated to be about \$4 billion
- Damage to buildings and facilities occurred within a 9000 sq. km region
- The effects were felt over an area of about 200,000 sq. km, with isolated reports of movement up to 800km from Newcastle (Newcastle Council, 2021).

Analysis	Rating
Community concern	Not rated
Perceived level of community preparedness	Not rated
Likelihood	Possible
Consequences	Moderate
Overall risk	High
Risk trend (+ 30 years)	Limited change
Communities at highest risk	Whole of community

Terror attack

Terror attacks have emerged over the past decade as a significant risk for cities and their communities. The 16-hour siege of the Lindt café in Martin Place in December 2014 showed Sydney is not immune.

This incident resulted in 3 deaths and the closure and lock down of the financial district. Losses of over \$1.2 million were recorded.

Since the siege there have been a number of police arrests over terror plots to attack Sydney landmarks, as well as one executed terror attack in the Parramatta CBD that resulted in the loss of life of a NSW Police worker.

Analysis	Rating
Community concern	Low (Concerned or very concerned - 10%)
Perceived level of community preparedness	Moderate (Prepared or very well prepared - 23%)
Likelihood	N/A
Consequences	N/A
Overall risk	Probable ⁵
Risk trend (+ 30 years)	Potential increase
Communities at highest risk	Whole of community

⁵ Current Terror Alert Level as of December 2021 (Source: NSW Police)

Housing affordability

Housing affordability relates to house prices in relation to incomes. A common measure of affordable housing is spending less than 30% of a person's income per week on repayments or rent. With median LGA house prices of \$1.73 million in 2018 with reports of this rising to \$2.2 million in 2021, many incomes are now not keeping pace with house price increases, leading to mortgage and rental stress. Housing affordability seems to be at a crisis point, with three Northern Beaches suburbs ranked in the top ten most at risk of a mortgage default in Sydney. Northern Beaches currently has a shortage of over 8,100 dwellings for social and affordable housing across the LGA, and this figure is predicted to increase to almost 10,000 by 2036.

The associated issue of limited housing choice across the LGA place similar burdens on the elderly for whom options for 'ageing in place' are restricted as housing stock predominantly is separate dwellings and apartment living - there is a 'missing middle' of dwellings such as townhouses which has been identified in Council's draft Housing Strategy (2021c).

Increasing housing unaffordability can impact health, education and employability. The pandemic has put further pressure on servicing home loans with many owners experiencing financial stress due to lockdowns. On a wider LGA scale, it means that population diversity may increasingly decline as younger people and families move out of the area in search of cheaper accommodation elsewhere. This has a potential to breakdown important social and family support networks, impacting both younger and older generations alike.

Housing affordability has been rated the most pressing concern for the community and businesses, with 66% of phone survey participants rating this to be of high or very high concern and was a dominating topic of discussion during community focus groups.

Analysis	Rating
Community concern	High (Concerned or very concerned - 66%)
Perceived level of community preparedness	Low (Prepared or very well prepared - 13%)
Trend (+30 years)	Increasing
Communities at highest risk	Whole of community

Climate change

Climate change is a fundamental and underlying challenge affecting all aspects of our lives and being a significant root cause of shocks and natural hazards such as bushfires, floods and erosion. It refers to long term changes in the climate, lasting for several decades or longer. The scientific evidence shows the world’s climate is rapidly heating at a rate that is much faster than previous climate changes. The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (August 2021) states that climate change is widespread, rapid and intensifying and is a result of human activities.

Our LGA is particularly vulnerable to natural hazards such as coastal erosion, storms, flooding, landslip and bushfires. As the climate changes, heatwaves, severe bushfire conditions, storm surges, sea-level rise, heavy rainfall and flooding, which are already more frequent, will increase.

Aside from the clear impacts to our environment, climate change also affects our physical and mental wellbeing, with vulnerable groups being particularly exposed (as discussed above, as related to heatwaves) and ‘climate anxiety’ exacerbating mental health issues, particularly amongst young people (State of the World’s Children, UNICEF 2021).

Climate change is of significant community concern, with 45% of phone survey respondents and 48% of online being concerned or very concerned, with only 20% stating that we are prepared to meet this challenge.

Analysis	Rating
Community concern	High (Concerned or very concerned - 45%)
Perceived level of community preparedness	Moderate (Prepared or very well prepared - 20%)
Trend (+30 years)	Increasing
Communities at highest risk	Whole of community

Environmental degradation

Environmental degradation occurs when the natural environment (such as air, water, soil and native vegetation cover) is compromised, leading to a decline in the health of the environment and reduced biological diversity. These risks are closely related to broader issues of climate change, urban sprawl, and population growth. Specific threats to environmental degradation on the Northern Beaches include land clearing, weed invasion, fauna predation, feral rabbits, altered fire regimes and nutrient enrichment.

The natural environment is key to our values and sense of wellbeing. The Northern Beaches offers an unusually wide variety of environmental values and ecosystem services, including 1460 native plant species, 540 native animal species, 17km² of bushland, 80km of coastline, 24 ocean beaches, four protected intertidal areas, seven freshwater catchments, wetlands, lagoons, five aquatic reserves, and three National Parks.

The Northern Beaches LGA provides multiple ecosystem services which contribute significant value to the wellbeing and health of local residents and also to the local economy, including the tourism sector.

Local ecosystems that are under particular pressure include Narrabeen Lagoon and Manly Dam which experience run-off pollution, and an increase in feral animals and weed impacts, which have the potential to affect ecosystem services and recreational values. In some cases, there is a trade-off between protection of lives and properties and protection of environmental values and ecosystems (i.e. at Wakehurst Parkway there is a need to manage flood mitigation measures alongside protection of threatened wildlife habitat).

Analysis

Rating

Community concern	High (Concerned or very concerned - 45%)
Perceived level of community preparedness	Moderate (Prepared or very well prepared - 23%)
Trend (+30 years)	Increasing
Communities at highest risk	Whole of community

