



URBAN HEAT STRATEGY

JUNE 2022

ACKNOWLEDGEMENT OF COUNTRY

We remember and respect the Ancestors who cared for and nurtured this Country.

Dhumaan ngayin ngarrakalu kirraanan barayidin.

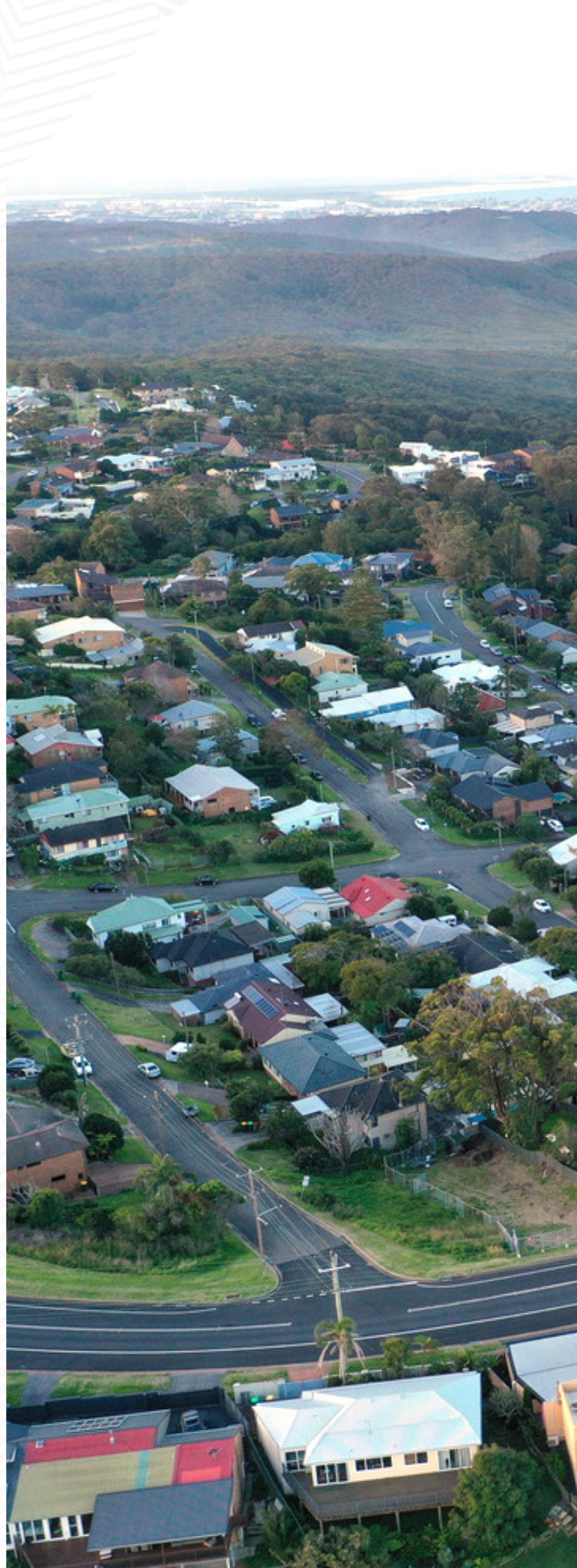
It is in their footsteps that we travel these lands and waters.

Ngarrakalumba yuludaka bibayilin barayida baaduka.

Lake Macquarie City Council acknowledges the Awabakal people and Elders past, present and future.

Lake Macquarie City Council dhumaan Awabakala ngarrakal yalawaa, yalawan, yalawanan.

Wording by the Aboriginal Reference Group and translated by Miromaa Aboriginal Language and Technology Centre.





OBJECTIVES AND KEY ACTIONS

OBJECTIVE	KEY ACTIONS
<p>1. Increase the amount of green cover and vegetation.</p>	<p>1.2 Undertake a pilot project on a Council building to develop a model green roof with sensor monitoring.</p> <p>1.5 Update tree planting guides with species that are better adapted to warmer conditions, changes to planting methods (where trees are located and how they are managed), and include trees that are less combustible to reduce risk of bush fire.</p>
<p>2. Improve selection of building and construction materials to make them more resilient, and reduce the impacts of urban heat.</p>	<p>2.1 Develop guidance material for developers, residents and other key stakeholders for:</p> <ul style="list-style-type: none"> • green roofs, green walls and other landscape treatments, including lifecycle costs • cool roof products • selection and use of water sensitive urban design. <p>2.2 Undertake a pilot cool roof project on an existing or new Council asset with sensor monitoring.</p> <p>2.3 Work with universities, think tanks and other research organisations to develop a document or checklist outlining a range of cooler materials including specifications, costings, benefits and drawbacks.</p> <p>2.4 Incorporate a pilot cool pavement treatment into a Council project with sensor monitoring or thermal imagery.</p>
<p>3. Make changes to policy and legislation to recognise the challenge of urban heat and encourage cooling strategies.</p>	<p>3.2 Investigate options for the inclusion of a heat-related aim or provision into the Lake Macquarie Local Environmental Plan (LEP) to account for rising temperatures.</p> <p>3.3 Investigate options to include heat-smart design principles in the Lake Macquarie Development Control Plan (DCP).</p>
<p>4. Increase community resilience in adapting to urban heat.</p>	<p>4.1 Implement the awareness and communication action plan from the heatwave planning template for Lake Macquarie.</p> <p>4.4 Expand the use of temperature sensors to better understand heat distribution across the city and add to Council's data portal to increase awareness with the community.</p>
<p>5. Ensure Council activities account for rising temperatures.</p>	<p>5.5 Incorporate climate change considerations including heat resilient design principles into Council Asset Management Plans.</p>

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EXECUTIVE SUMMARY

Urban heat and heatwaves are a significant and growing issue for Lake Macquarie. Extreme heat can cause death, impact health and wellbeing and disrupt transport, utilities and other services.

Research has shown we are already experiencing the urban heat island effect in our densely populated urban areas. The impact of the urban heat island effect and extreme heat depends on our ability to adapt. Certain sections of the community are more vulnerable to urban heat, such as less mobile people, outdoor workers and low-income households.

Climate change is expected to increase the number of extreme events including longer, hotter and more intense heatwaves in Australia.

In order to respond to the challenge of urban heat, we require a broad, coordinated approach in collaboration with other organisations, government agencies and the community. This strategy aims to guide Council and the community to take local, practical and coordinated action on urban heat and make our communities in Lake Macquarie cool, liveable and resilient.

The Urban Heat Strategy identifies five objectives and an action plan with 25 actions to address urban heat over the short term (1-2 years) and medium term (3-5 years).

VISION

Our vision is for the communities of Lake Macquarie to be cool, liveable and resilient to the impacts of urban heat.

Buran-ngayarun:

Barai Awaba-kulang takaraku, kakilaku, karrakalumuliku-ngatan karulkala.

Wording translated by Miromaa Aboriginal Language and Technology Centre.

MESSAGE FROM THE MAYOR

We are all so lucky to live in a place as beautiful and accessible as Lake Macquarie.

However, our growing population is driving the need for more homes, adding to the demand not only for infill development, but also to expand our city at its fringes.

One of the repercussions of this growth is the increasing impact of urban heat – warmer temperatures often felt in densely populated areas where urban development is greatest and green areas are scattered more sparsely.

Combine those effects with increasing temperatures caused by climate change, and growing cities right across the globe, including Lake Macquarie, are presented with an emerging issue that requires determined action to address.

That's where our Urban Heat Strategy comes into play.

Our vision is for the communities of Lake Macquarie to be liveable and resilient to the impacts of urban heat, whether they're closer to the coast where the cool sea breezes blow, or further west where it's typically hotter.

We want to address urban heat through urban greening, and by selecting the right building and construction materials to reduce its effects.

And we're aiming to build resilience to its effects within our community and through Council's own operations and services.

From the deployment of temperature sensors across the city to 'green roof' pilot projects, this document sets out a framework of actions to help ensure Lake Macquarie continues to be an enviable place to live, work and play.

Councillor Kay Fraser
Mayor



SECTION 1

SETTING THE SCENE

Urban heat and heatwaves are a significant and growing issue for Lake Macquarie. Recent summer weather patterns, along with projected increases in the frequency, intensity and duration of extreme weather events including heatwaves, will put pressure on our community and our assets.

WHAT IS URBAN HEAT?

Urban heat consists of extreme heat days, extreme heat events and the urban heat island effect.

Extreme heat days are days where the temperature exceeds 35°C.

Extreme heat events are three or more days of high maximum and minimum temperatures that are unusual for that location. One of the greatest local drivers of extreme heat events, and ultimately exposure of a community, is the urban heat island effect.

The urban heat island effect (Figure 1) refers to the condition where urban areas experience a high temperature when compared to surrounding, more rural areas and/or those areas that have higher percentages of vegetated cover (for example, parks, bushland reserves and low-density residential areas). Additionally, surface thermal mass temperature associated with paved materials retains heat, limiting the ability for cooling at night time.

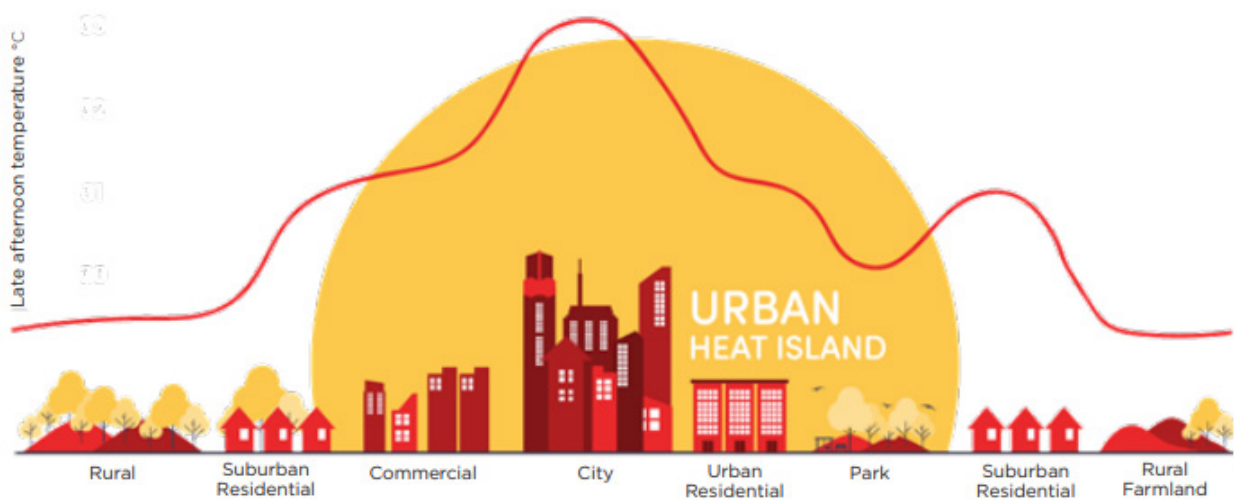


Figure 1: The urban heat island effect where urban areas experience a high temperature when compared to surrounding, more rural areas and/or those areas that have higher percentages or vegetated cover (WSROC, 2018).

WHY DO WE NEED A STRATEGY?

More Australians die from extreme heat events than any other natural disaster (Hughes, 2016). Extreme heat events can also have additional impacts on an individual's health and wellbeing, as well as result in disruption to transport, utilities and other services. We want to reduce the impacts of heat across Lake Macquarie.

The frequency, extent and duration of extreme heat events is projected to increase in the future (Figure 2), with potential impacts on public and private assets. Council has already experienced

damage to assets and impacts on operations, maintenance and availability of services as a result of extreme events.

Responding to the hazards and impacts of urban heat requires a broad, coordinated approach in collaboration with other organisations, government agencies and the community.

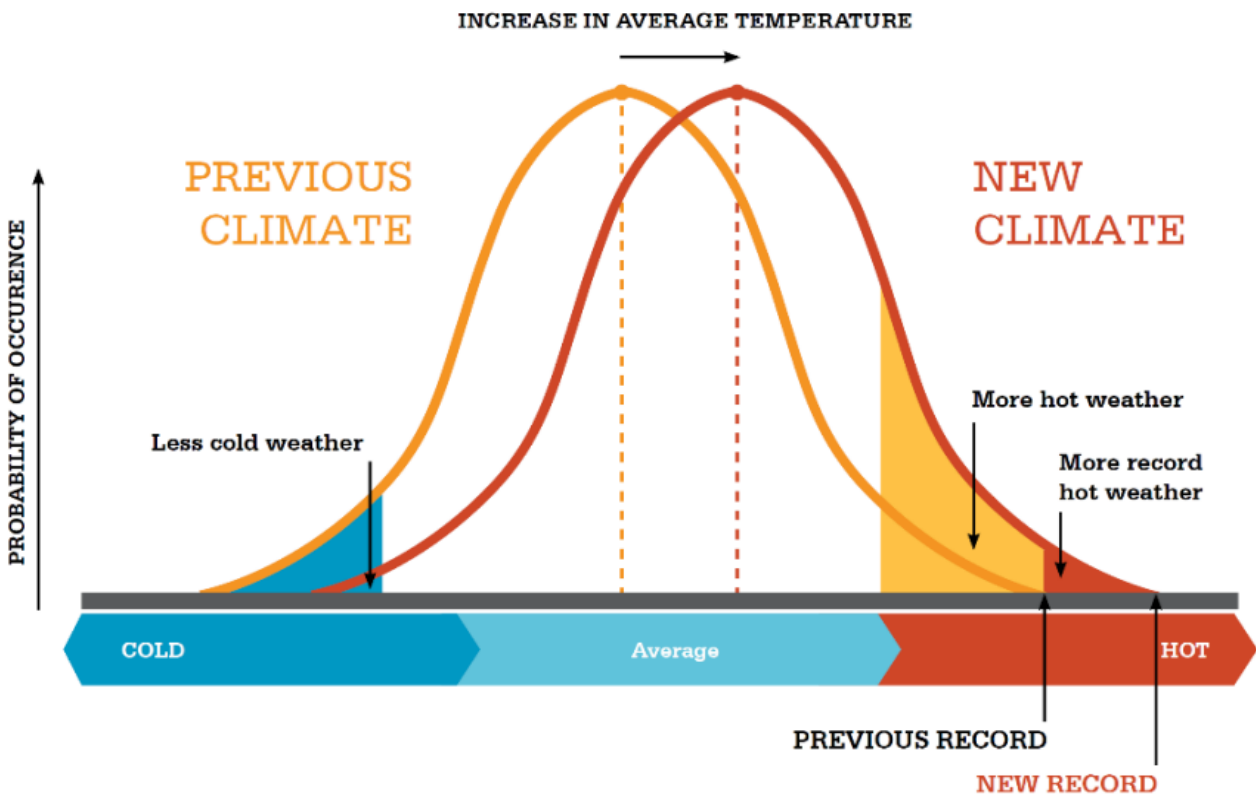


Figure 2: As the climate changes, Lake Macquarie is experiencing an increasing number of hot days and heatwaves. This chart shows how, as the climate warms, there will be a significant increase in hot weather and heatwaves (WSROC, 2021).

WHAT ARE THE GOALS OF THE STRATEGY?



This strategy aims to guide Council and the community to take local, practical and coordinated action to address urban heat and make our communities in Lake Macquarie cool, liveable and resilient.



We want our residents to have access to information, resources and the ability to adapt to, and help mitigate, the impacts of urban heat.



We want our economic centres and neighbourhoods to incorporate cooling principles such as good building design, selection of appropriate construction materials, use of water-sensitive urban design, and a healthy and diverse urban forest.



We want to ensure Council has the resources and capacity to continue to deliver a high level of service to our community in response to extreme heat.



HOW DOES THE URBAN HEAT STRATEGY LINK TO OTHER COUNCIL STRATEGIES?

Sustainable Development Goals

Like many other cities, Lake Macquarie faces the ongoing challenges of protecting and enhancing our natural landscapes while supporting the development of a sustainable, resilient city and communities – maximising the wellbeing of the city’s residents while reducing the city’s ecological footprint.

The United Nations Sustainable Development Goals (SDGs) provide a framework for the integration of environmental, social, economic and governance aspects of sustainability into

local government responsibilities. Council’s Sustainability Policy commits us to using the SDG framework as a way of implementing our sustainability initiatives. The table below shows the links between the SDGs and this strategy’s objectives. The Urban Heat Strategy will help Council make progress on 11 of the 17 SDGs.

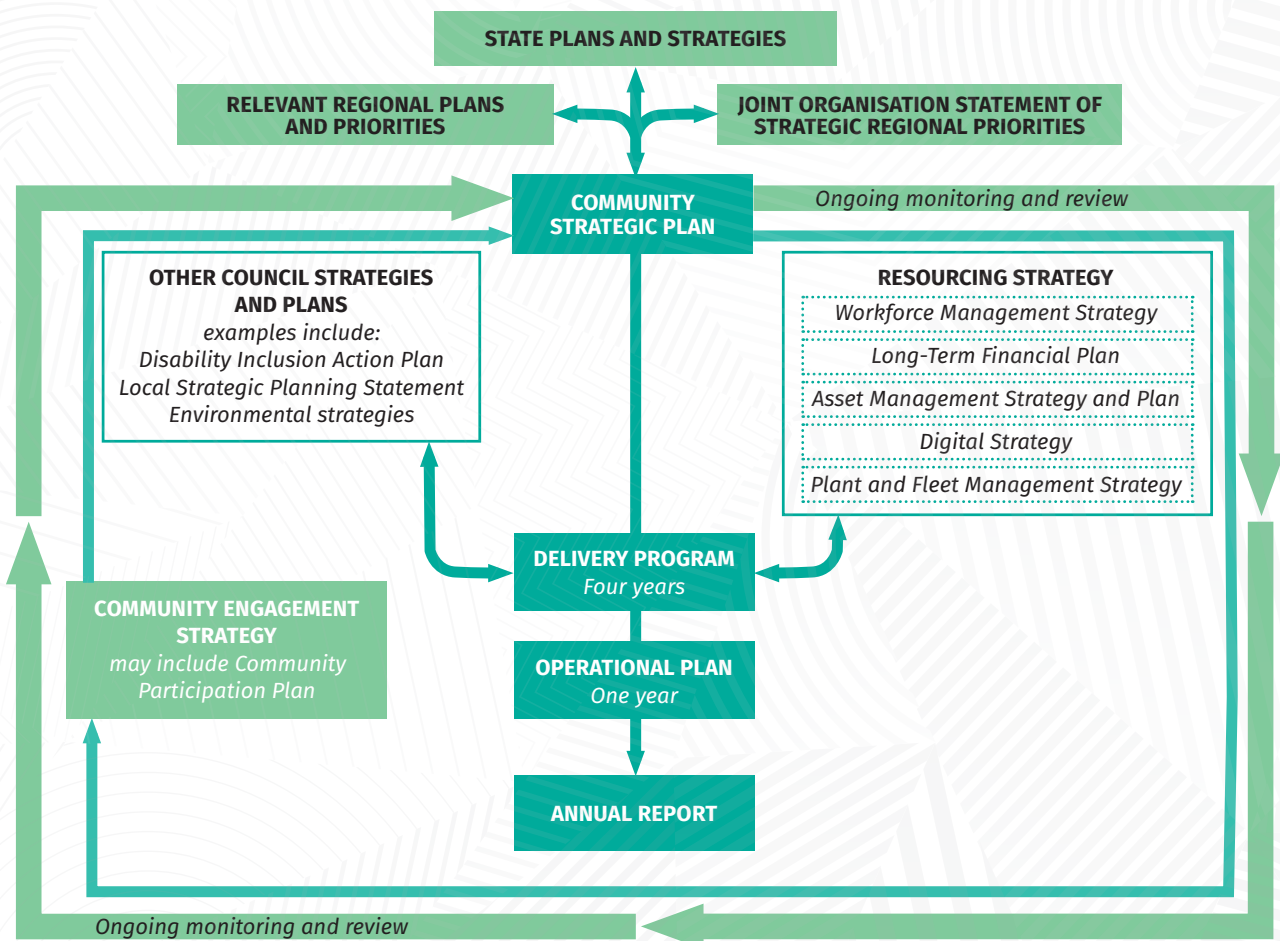
The SDGs have also been mapped to this strategy’s actions in the Action Table in Section 5, recognising the importance in driving local, sustainable and inclusive development.

OBJECTIVE	SDGS LINKS
1 <i>Increase the amount of green cover and vegetation in urban areas.</i>	6 CLEAN WATER AND SANITATION, 7 AFFORDABLE AND CLEAN ENERGY, 8 DECENT WORK AND ECONOMIC GROWTH, 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE, 11 SUSTAINABLE CITIES AND COMMUNITIES, 13 CLIMATE ACTION, 14 LIFE BELOW WATER, 15 LIFE ON LAND, 17 PARTNERSHIPS FOR THE GOALS
2 <i>Improve selection of building and construction materials to make them more resilient, and reduce the impacts of urban heat.</i>	6 CLEAN WATER AND SANITATION, 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE, 11 SUSTAINABLE CITIES AND COMMUNITIES, 13 CLIMATE ACTION, 15 LIFE ON LAND, 17 PARTNERSHIPS FOR THE GOALS
3 <i>Make changes to policy and legislation to recognise the challenge of urban heat and encourage cooling strategies.</i>	6 CLEAN WATER AND SANITATION, 7 AFFORDABLE AND CLEAN ENERGY, 8 DECENT WORK AND ECONOMIC GROWTH, 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE, 11 SUSTAINABLE CITIES AND COMMUNITIES, 12 RESPONSIBLE CONSUMPTION AND PRODUCTION, 13 CLIMATE ACTION, 15 LIFE ON LAND, 17 PARTNERSHIPS FOR THE GOALS
4 <i>Increase community resilience in adapting to urban heat.</i>	1 NO POVERTY, 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE, 11 SUSTAINABLE CITIES AND COMMUNITIES, 12 RESPONSIBLE CONSUMPTION AND PRODUCTION, 13 CLIMATE ACTION, 15 LIFE ON LAND, 17 PARTNERSHIPS FOR THE GOALS
5 <i>Ensure Council activities account for rising temperatures.</i>	6 CLEAN WATER AND SANITATION, 11 SUSTAINABLE CITIES AND COMMUNITIES, 12 RESPONSIBLE CONSUMPTION AND PRODUCTION, 13 CLIMATE ACTION, 14 LIFE BELOW WATER, 15 LIFE ON LAND



Integrated Planning and Reporting Framework

The Lake Macquarie City Integrated Planning and Reporting Framework supports the Community Strategic Plan, Delivery Program and Operational Plan. The Framework includes a suite of integrated and strategic plans that set out a vision, goals, directions and actions to achieve them. It involves a reporting structure to communicate progress to Council and the community, as well as a structured timeline for review to ensure the goals and actions are still relevant.



Community Strategic Plan 2017-2027

The Lake Macquarie Community Strategic Plan (CSP) 2017-2027 was developed in consultation with the community and sets out the city's vision and community values. The vision and values reflect the priorities of our residents and shape policies and plans prepared by Council, including this strategy. The Urban Heat Strategy aligns with the objectives of four of the seven key focus areas of the Community Strategic Plan, as shown below.

UNIQUE LANDSCAPE

- Natural environments are protected and enhanced
- We have vibrant town centres and villages
- New development and growth complements our unique character and sense of place
- Our natural landscape is an integral part of our city's identity

LIFESTYLE AND WELLBEING

- Our community has access to adaptable and inclusive community and health services
- Our public spaces help us feel healthy and happy

MOBILITY AND ACCESSIBILITY

- People of all abilities use and enjoy our places and spaces

CONNECTED COMMUNITIES

- Public spaces help connect us with each other and the world
- Our community responds and adapts to change

Local Strategic Planning Statement

The Local Strategic Planning Statement outlines how we will achieve our city vision and uphold our community values through strategic planning. The Urban Heat Strategy aligns with the principles of three of the seven planning priority areas, as shown below.

PLANNING PRIORITY 1:

A city of vibrant centres – where people live, work, visit and play

- Enhance urban greenery to address heat island effects and to increase shade

PLANNING PRIORITY 2:

A city to call home – where diverse housing options cater to everyone's needs

- Ensure new growth areas are highly liveable and well serviced with access to services, facilities and social opportunities by a range of transport modes

PLANNING PRIORITY 7:

A city of resilience – where the people and places are responsive and proactive to change

- Identify significant changes in global and local social, climatic and economic trends
- Identify areas and issues that need adaptation plans



Environmental Sustainability Strategy and Action Plan 2020-2027

The Lake Macquarie City Environmental Sustainability Strategy and Action Plan (ESSAP) 2020-2027 provides a framework for sustainability planning, decision-making and action to achieve improved environmental sustainability for Lake Macquarie City. The Urban Heat Strategy aligns with the ESSAP Strategic Theme 2: Supporting Resilient Communities. The strategy specifically addresses management actions RC4 and RC5 as shown below, and also relates to management actions RC3, RC10, RC15, RC16, RC28, RC29, RC30, RC31, RC32, RC33 and RC34.

ESSAP 2020-2027 REFERENCE

MANAGEMENT ACTION

RC4

Plan and implement community engagement campaigns related to priority environmental health issues including air pollution, heat stress and contaminated land.

RC5

Investigate and develop new building and landscape design guidelines, and encourage building, infrastructure and landscape designs that are able to adapt more easily to climate change and sea level rise.

Urban Greening Strategy

Council’s Urban Heat Strategy and the Urban Greening Strategy are related, with common objectives and targets to increase the amount of green cover and vegetation. However, the Urban Greening Strategy has further actions beyond trying to mitigate the impacts of urban heat. Similarly, the Urban Heat Strategy has objectives beyond increasing the urban forest.

Figure 3 below shows the relationship between the objectives of the two strategies.

As there is overlap between some of the objectives of the strategies, there is also an overlap in some of the actions required. Where there is double up of an action, this has been included in the Urban Greening Strategy only. The Urban Heat Strategy Action Table in Section 5 includes an action to carry out the Urban Greening Strategy actions.

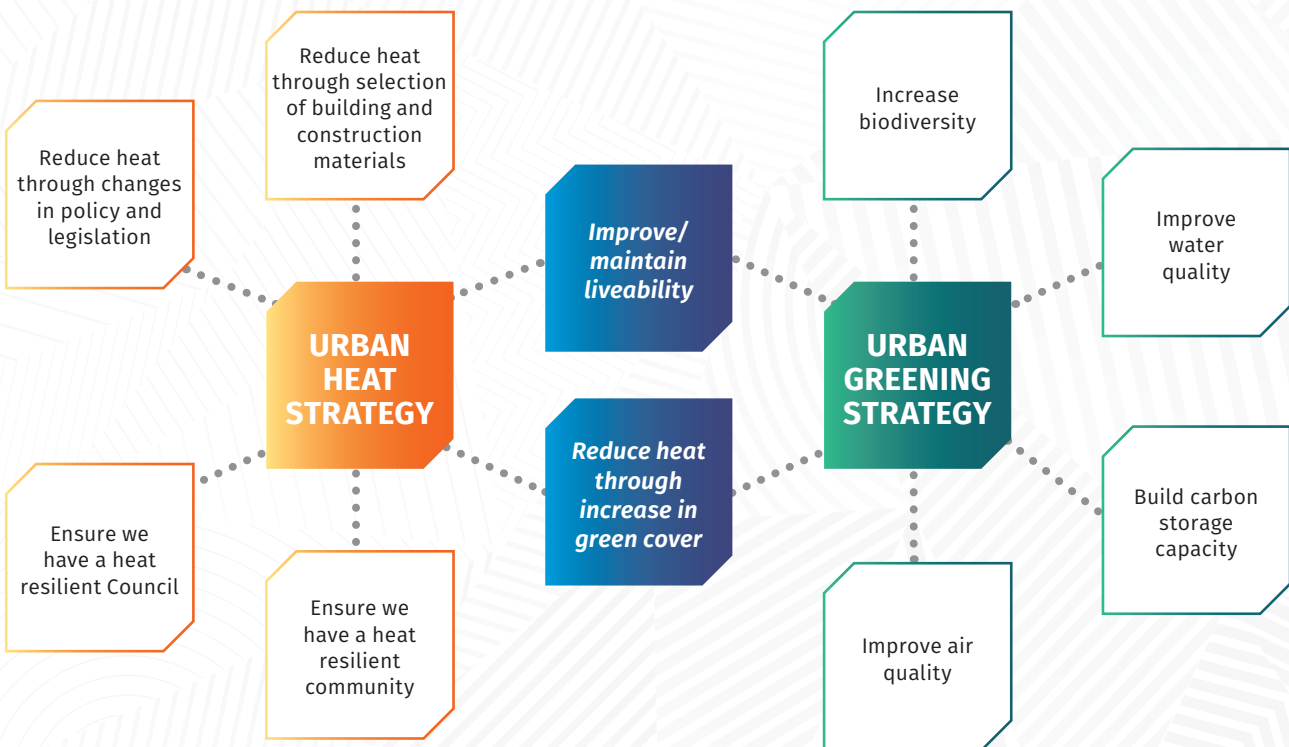


Figure 3: Relationship between the objectives of the Urban Greening Strategy and the Urban Heat Strategy

What have we learnt from the community so far?

A review of community surveys and previous community engagement has helped us develop an understanding of current community needs and attitudes in relation to urban heat. We have learnt that the community:

- rates extreme heat or heatwaves as the second highest natural disaster threat after severe storms
- have observed that heatwaves are occurring more frequently
- feel like more work is needed to prepare the local area to heatwaves
- support the urban heat initiatives outlined in the Local Strategic Planning Statement and Environmental Sustainability Strategy and Action Plan 2020-2027.

Council has also been actively working with other government organisations including Department of Planning, Industry and Environment, NSW Health and the Hunter Joint Organisation in the development of the strategy.

This strategy and associated actions will need to adapt to the changing needs of the community, and will be updated in response to new information, data and feedback.

We will continue to engage with the community, relevant government departments and other stakeholders such as sustainable neighbourhood groups and industry groups as we deliver the actions provided in Section 5.





SECTION 2

IT'S GETTING HOT IN LAKE MAC

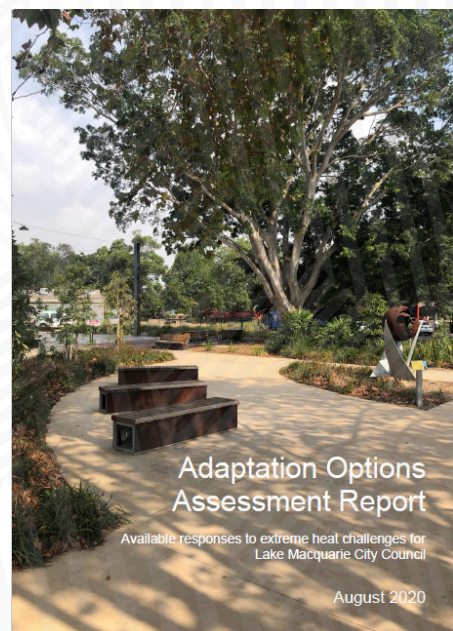
In 2020, Council engaged AECOM to help better understand how urban heat impacts Lake Macquarie.

AECOM assessed the thermal performance of the city, identified vulnerable populations and considered current and future impacts of climate change. They also benchmarked and reported on how other councils and organisations were managing urban heat around the world. These options were considered and refined through workshops with Council staff, to assess the potential options to include in an Urban Heat Strategy.

This work was compiled into two reports:

- Baseline Thermal Assessment, Thermal performance of the Lake Macquarie Local Government Area, Lake Macquarie City Council, 18 August 2020
- Adaptation Options Assessment Report, Available responses to extreme heat challenges for Lake Macquarie City Council, August 2020.

The key findings of the work carried out by AECOM helped form the basis of this strategy. Copies of the reports are available on request.



WHAT DO WE KNOW ABOUT URBAN HEAT IN LAKE MAC?

Our city's densely populated urban areas have a higher exposure to urban heat, as shown in Figure 4. This is largely due to the lack of vegetation and the thermal properties of materials currently used in construction.

Temperature extremes are more common in the west of the city (Figure 5). This is largely due to the cooling effects of Lake Macquarie, the ocean and coastal breezes experienced in the city's east.

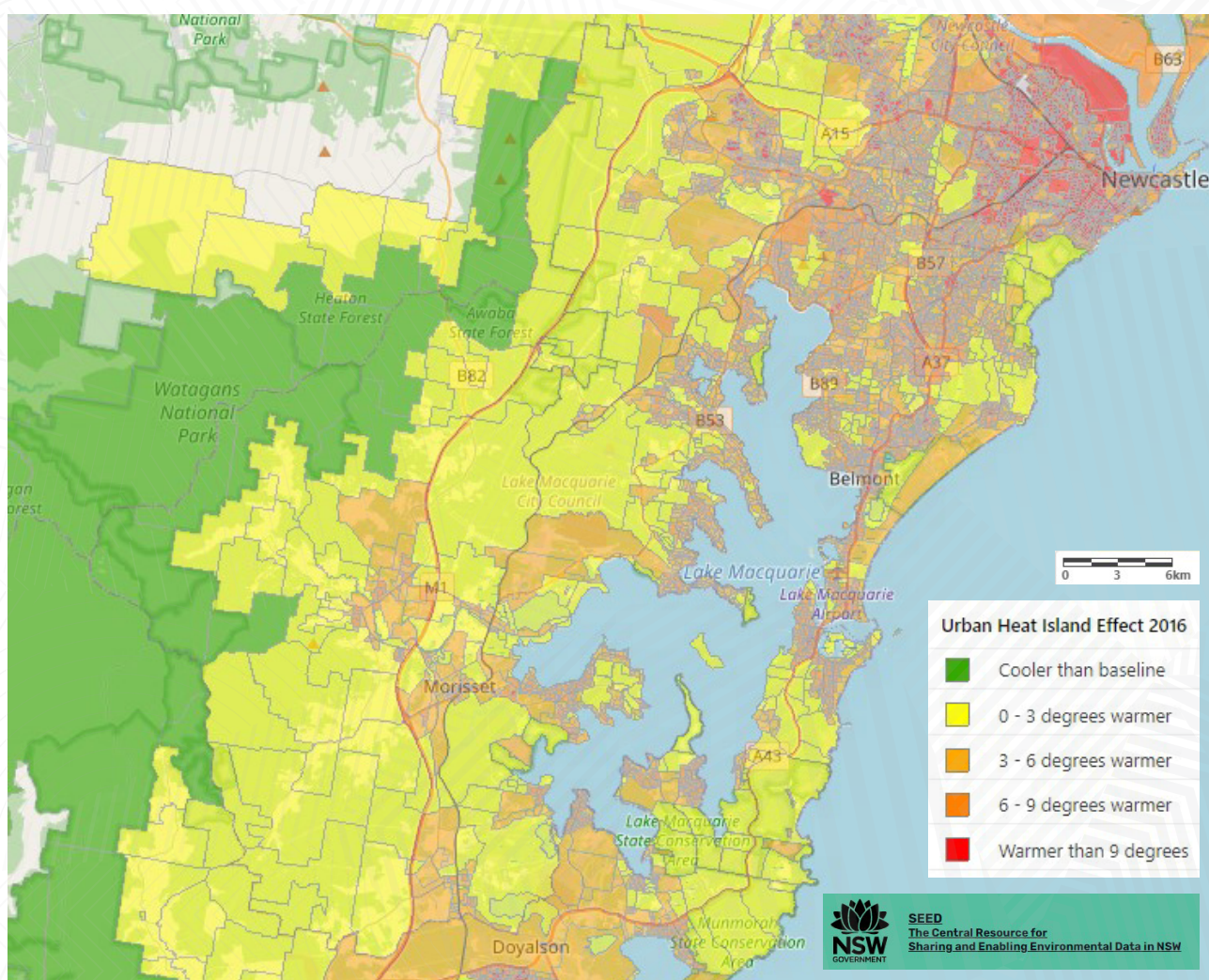


Figure 4: Land surface temperatures as measured during the summer of 2015-2016 (DPIE, 2016).

The following suburbs were identified as having temperatures greater than 9°C above the baseline (assessed during the summer of 2015-2016).

- Cameron Park
- Argenton
- Cardiff/Glendale
- Warners Bay
- Macquarie Hills
- Charlestown
- Swansea/Caves Beach
- Belmont/Belmont North
- Bonnells Bay
- Morisset
- Toronto.

AVERAGE NUMBER OF EXTREME HEAT DAYS ON THE EASTERN SIDE OF THE LOCAL GOVERNMENT AREA (LGA) COMPARED TO THE WESTERN SIDE OF THE LGA (GREATER THAN 35°C)

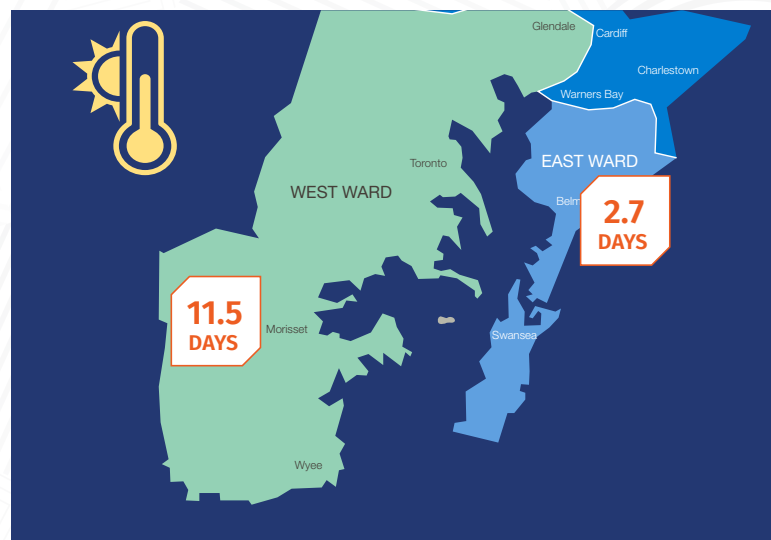


Figure 5: Average number of extreme heat days on the eastern side of the lake compared to the western side of the lake

The local variation between suburbs can also vary dramatically. Measurements recorded over 1-2 February 2020 found there was an 11°C difference in the maximum temperatures between suburbs (Figure 6).

MAXIMUM TEMPERATURE RECORDED OVER 1-2 FEBRUARY 2020

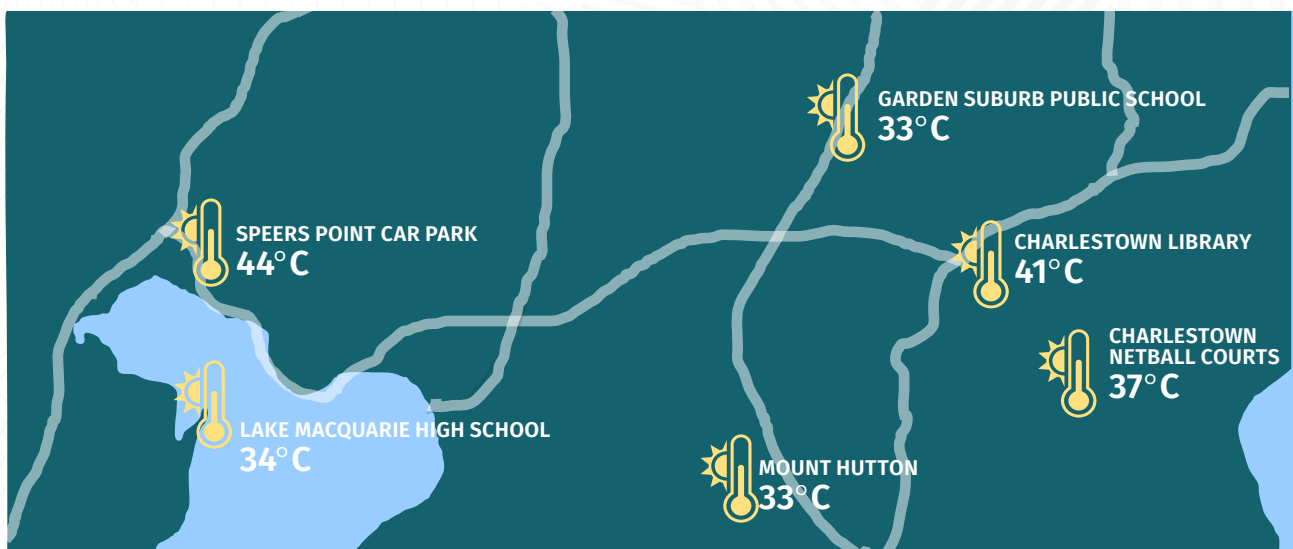


Figure 6: Maximum temperature recorded over 1-2 February 2020

COMPARISON OF RECENT RESIDENTIAL DEVELOPMENTS

Cameron Park



Murrays Beach

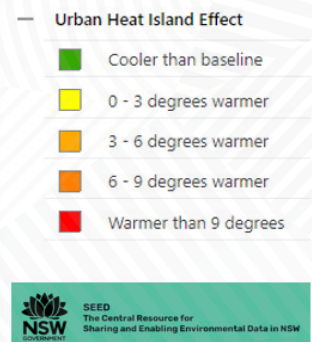


Figure 7: Land surface temperatures in Cameron Park and Murrays Beach as measured during the summer of 2015-2016.

Figure 7 highlights the difference in temperatures between recent residential developments in Cameron Park (where vegetation was removed) and Murrays Beach (where vegetation was retained where possible). In Cameron Park, urban development is characterised by small blocks with little to no natural shading (for example, street trees), limited water features, dark tile roofs and scattered pockets of open space. This results in observed temperatures in excess of 9°C warmer than surrounding areas impacting thermal comfort of residents, increasing the required costs of operation and generally decreasing the lifespan of public and private assets.

In comparison, urban development at Murrays Beach is characterised by small to medium blocks with abundant mature canopy trees in public and private areas, lighter coloured roofs, with cool materials and dense areas of open space and vegetation. This results in observed temperatures between 0°C and 6°C warmer than surrounding areas providing relief, improved thermal comfort, lower operating costs and maintaining the lifespan of public and private assets.

WHO IS AFFECTED BY URBAN HEAT IN LAKE MAC?

The impacts of heatwaves are not experienced evenly across the community. The AECOM baseline study reported that certain sections of the community are more vulnerable to the health impacts caused by heatwaves, including:

- the elderly
- people with disability
- families with young children
- low-income households
- culturally and linguistically diverse communities
- outdoor workers
- indigenous communities
- obese and overweight people
- those living in rural and isolated communities.

This directly influences the liveability for many members of the Lake Macquarie community.

The areas identified as having the highest exposure and being most vulnerable are ultimately those urban centres and regions with limited ability to adapt:

- Cameron Park
- Boolaroo/Speers Point
- Cardiff/Glendale
- Warners Bay
- Swansea/Caves Beach
- Belmont
- Morisset
- Toronto
- Charlestown.

The overall vulnerability was calculated using the Urban Heat Island data from the Office of Environment and Heritage (to highlight warmer temperatures) and the Heat Vulnerability Index, also from the Office of Environment and Heritage, highlighting exposure, vulnerable populations (young and old) and persons needing care (Figure 8).

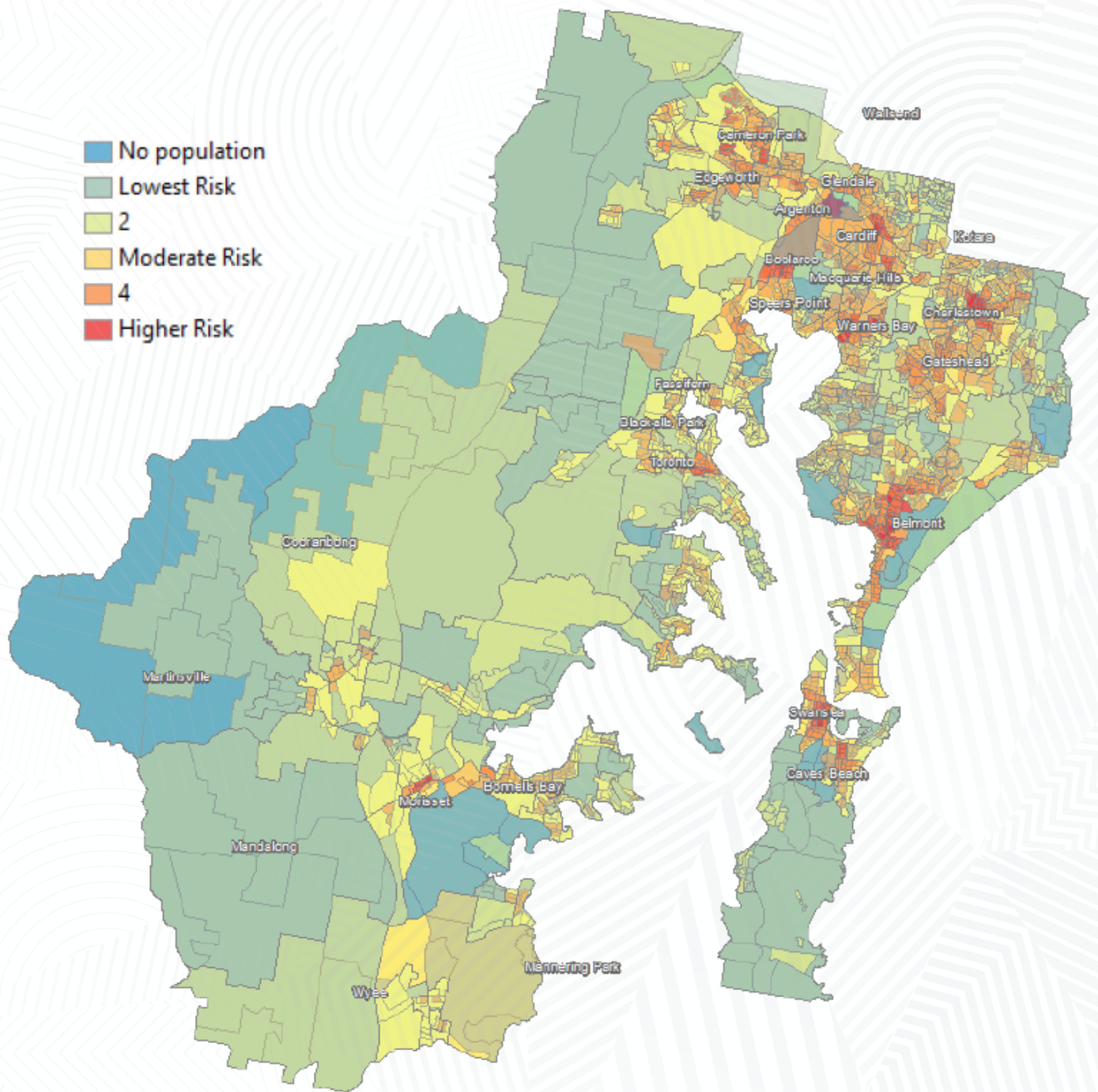


Figure 8: Heat vulnerability mapping of Lake Macquarie (AECOM, 2020).

HOW IS CLIMATE CHANGE LIKELY TO AFFECT URBAN HEAT?

Lake Macquarie is a rapidly growing area for housing, businesses, industry and tourism. Existing and future development, and the traditional 'hardstand' infrastructure associated with these sectors, is anticipated to further exacerbate the effects of extreme heat. There are likely to be impacts on Council assets, operations and ability to provide services to the community.

In addition, climate change is driving an increase in the number of extreme events including longer, hotter and more intense heatwaves in Australia. The AECOM baseline report identifies that since 1960, the number of record hot days in Australia has doubled, and heatwaves have become longer, hotter and more intense.

Under future climate scenarios, Lake Macquarie can expect to experience a temperature increase of just over 1°C by 2030 and nearly 4°C warmer by 2090. Furthermore, the Lake Macquarie region is projected to experience an additional five days per year over 35°C by 2030, and up to 15 additional days by 2090 (total of 17 days and 27 days for 2030 and 2090 respectively).

While projections note overall increases in temperature, a variety of seasonal changes in temperature are also projected. Trends in seasonal temperature can influence activities, operations and generally how Council can respond to extreme heat.

2020

12 days/year
over 35°C

2030

+5 days
17 days/year
over 35°C

2090

+15 days
27 days/year
over 35°C



WHAT CHALLENGES WILL WE FACE?

Responding to this issue requires a broad, coordinated approach in collaboration with other organisations, government agencies and the community. Action across all of Council is required to appropriately respond and address the challenges arising from increased temperatures and a greater frequency of heat events.

KEY CHALLENGES FOR COUNCIL WILL BE:

1. Increased cost pressures



More frequent energy usage (for example, air conditioning), increased demand for potable water (for example, irrigation), more frequent replacement of materials/equipment and additional funds used for emergency management/repair works (for example, potholes, degraded materials).

2. Changes to demand of service offerings



Increased usage and pressure on community facilities during heatwaves, reduction in sports field usage or festival patronage and water restrictions leading to closures of key assets. Heatwaves and high temperatures are also likely to result in demand increases for social support services to improve mental health and/or facilitate reductions in anti-social behaviour.

3. Disruptions to work, health and safety



Outdoor workforces and members of the community are likely to face disruption from extreme heat days including the increased risk of heat-related illness.

4. Capacity to implement change



Changes to operations, design standards, assessment procedures and considerations for the community are likely to require time and resources to be fully adopted and integrated into Council processes, procedures and planning policy.

5. Community perception



Actions undertaken will invariably be influenced by community response on how Council are addressing challenges associated with urban heat.

These challenges are most likely going to impact high-density residential areas (with limited shading, and higher concentrations of dark pavement). This includes the identified growth areas and urban redevelopment corridors, industrial estates (with lack of shading) and commercial corridors (retained heat from paved materials), as well as our more vulnerable community members.

An aerial photograph of a coastal town and marina. The foreground shows a large marina filled with numerous white sailboats and yachts. To the right of the marina is a residential area with houses and trees. In the background, a large body of blue water stretches towards a distant shoreline with more houses and hills under a clear blue sky.

SECTION 3

HOW ARE WE GOING TO RESPOND TO URBAN HEAT?

Responding to the challenges identified will require us to implement planning, design and operational solutions in both the short-term and medium-term, particularly when considering the design life of assets.

OBJECTIVES

There are five objectives of this strategy:

OBJECTIVE 1.

Increase the amount of green cover and vegetation in urban areas.



WHAT THIS WILL ACHIEVE

Using trees and other vegetation to reduce temperatures has a range of benefits including:

- reduction in energy use
- improved biodiversity outcomes and food production
- reduction in maintenance costs for infrastructure
- an uptake of carbon storage and sequestration.

OBJECTIVE 2.

Improve selection of building and construction materials to make them more resilient, and reduce the impacts of urban heat.



WHAT THIS WILL ACHIEVE

As the thermal characteristics of buildings tend to result in heat storage, using materials that have 'cooling' properties, such as greater reflectivity, less heat capacity or more permeability, can have drastic results in reducing urban heat. Key elements of the built environment include paving, roofs and walls.

OBJECTIVE 3.

Make changes to policy and legislation to recognise the challenge of urban heat and encourage cooling strategies.



WHAT THIS WILL ACHIEVE

Planning represents some of the earliest opportunities to embed heat mitigation strategies into the development cycle of an asset. Key amendments can be made to Local Environmental Plans, Development Control Plans, Local Strategic Planning Statements, BASIX, National Construction Code and Council Asset Management Plans.

OBJECTIVE 4.

Increase community resilience in adapting to urban heat.



WHAT THIS WILL ACHIEVE

Building awareness through providing resources, materials and options to our vulnerable community will build resilience and ensure our community is able to successfully adapt.

OBJECTIVE 5.

Ensure Council activities account for rising temperatures.



WHAT THIS WILL ACHIEVE

Building resilience in Council systems and processes will ensure services for the community are maintained during extreme heat events.

An Action Table is provided in Section 5 detailing 25 actions to achieve the objectives of this strategy. A checklist is also provided in Appendix 1 to provide guidance for developers to address urban heat.

SECTION 4

MONITORING, REPORTING AND EVALUATION

There are three pilot projects identified in the Action Plan in Section 5: a model green roof, a cool roof and cool pavement. These projects will include sensor monitoring which will be included in the evaluation of the pilot project and determination of whether the project should be scaled up.

A review of the Urban Heat Strategy will be undertaken every four years. The progress of the strategy will be measured by the percentage of actions commenced and completed. The strategy and actions will be updated in response to new information, data and feedback.

A report will be provided to Council at the completion of the review detailing the progress and outcomes of existing actions. The report will also detail any proposed changes to existing actions and any proposed new actions that have been developed.


An aerial photograph of a town, likely Lake Macquarie, showing a mix of residential and commercial buildings, green spaces, and a large body of water in the foreground. The sky is blue with some light clouds. In the top right corner, there is a decorative graphic of orange and white diagonal stripes.

SECTION 5

ACTION PLAN

An Action Plan has been developed to ensure the objectives of this strategy can be achieved.



Action	Timeframe	Responsibility	Monitoring/Evaluation outcomes	Strategic links	SDG links
 1. INCREASE THE AMOUNT OF GREEN COVER AND VEGETATION					
1.1 Implement the actions within the Urban Greening Strategy (UGS) to expand green cover and support tree planting.	See UGS for details	See UGS for details	See UGS for details	CSP LSPS ESSAP UGS	6, 8, 11, 13, 14, 15, 17
1.2 Undertake a pilot project on a Council building to develop a model green roof with sensor monitoring.	M	Asset Management Environmental Systems	Green roof installed	LSPS ESSAP UGS	9, 11
1.3 Create a community focal point incorporating living elements such as trees, plants and water.	S	Arts, Culture and Tourism Environmental Systems	Community focal point installed	CSP ESSAP UGS	9, 11
1.4 Update the Better Buildings Strategy to enable the use of green walls and roofs at Council facilities.	M	Environmental Systems	Strategy updated	ESSAP UGS	7, 9, 11
1.5 Update tree planting guides with species that are better adapted to warmer conditions, changes to planting methods (where trees are located and how they are managed), and include trees that are less combustible to reduce risk of bush fire.	S	Environmental Systems City Works	Tree planting guides updated	LSPS UGS	11, 13, 15

<p>TIMEFRAME</p> <p>S Short (1-2 years)</p> <p>M Medium (3-5 years)</p>	<p>STRATEGIC LINKS</p> <p>CSP Community Strategic Plan 2017-2027</p> <p>LSPS Local Strategic Planning Statement</p> <p>ESSAP Environmental Sustainability Strategy and Action Plan 2020-2027</p> <p>UGS Draft Urban Greening Strategy</p>
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Action	Timeframe	Responsibility	Monitoring/Evaluation outcomes	Strategic links	SDG links
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2. IMPROVE SELECTION OF BUILDING AND CONSTRUCTION MATERIALS TO MAKE THEM MORE RESILIENT, AND REDUCE THE IMPACTS OF URBAN HEAT

<p>2.1 Develop guidance material for developers, residents and other key stakeholders for:</p> <ul style="list-style-type: none"> • green roofs, green walls and other landscape treatments, including lifecycle costs • cool roofs products • selection and use of water sensitive urban design. 	S	Environmental Systems Development Assessment and Certification	Guidance material developed	ESSAP	6, 9, 11
<p>2.2 Undertake a pilot cool roof project on an existing or new Council asset with sensor monitoring.</p>	M	Asset Management Environmental Systems	Cool roof installed	ESSAP	9, 11
<p>2.3 Work with universities, think tanks and other research organisations to develop a document or checklist outlining a range of cooler materials including specifications, costings, benefits and drawbacks.</p>	S	Environmental Systems	Specification document or checklist developed	ESSAP	9, 17
<p>2.4 Incorporate a pilot cool pavement treatment into a Council project with sensor monitoring or thermal imagery.</p>	M	Asset Management Environmental Systems	Cool pavement installed	ESSAP	9, 11
<p>2.5 Review potential future changes to the National Construction Code and identify opportunities to include in guidance material for developers.</p>	S	Environmental Systems Development Assessment and Certification	National Construction Code reviewed	LSPS ESSAP	9
<p>2.6 Monitor updates to BASIX relating to energy and thermal performance. If required, lobby the NSW Government to further increase standards.</p>	M	Environmental Systems Development Assessment and Certification	Review of BASIX updates undertaken	LSPS ESSAP	13, 17
<p>2.7 Investigate the potential for a program to encourage more sustainable measures in development. The program may include:</p> <ul style="list-style-type: none"> • a partnership with a local developer to construct a demonstration home showing a best practise residential building • a partnership with a local developer to trial heat smart practises and building measures • incentives for developers to go over and above minimum standards. 	M	Integrated Planning Environmental Systems Development Assessment and Certification Property and Business Development	Program to encourage more sustainable measures in development investigated	ESSAP	6, 7, 8, 9, 11, 12, 17



Action	Timeframe	Responsibility	Monitoring/Evaluation outcomes	Strategic links	SDG links
 3. MAKE CHANGES TO POLICY AND LEGISLATION TO RECOGNISE THE CHALLENGE OF URBAN HEAT AND ENCOURAGE COOLING STRATEGIES					
3.1 Prepare additional heat-related principles and actions for incorporation into the next revision of the Lake Macquarie Local Strategic Planning Statement		Integrated Planning Environmental Systems	Heat related principles incorporated in Lake Macquarie Local Strategic Planning Statement	CSP LSPS	11, 13, 17
3.2 Investigate options for the inclusion of a heat-related aim or provision into the Lake Macquarie Local Environmental Plan (LEP) to account for rising temperatures.		Integrated Planning Development Assessment and Certification	Heat related provisions in Lake Macquarie LEP investigated	CSP LSPS	11, 13, 17
3.3 Investigate options to include heat-smart design principles in the Lake Macquarie Development Control Plan (DCP).		Integrated Planning Environmental Systems Development Assessment and Certification	Options to include heat-smart provisions included in the Lake Macquarie DCP investigated	LSPS ESSAP UGS	9, 11, 13, 15



Action	Timeframe	Responsibility	Monitoring/Evaluation outcomes	Strategic links	SDG links
 4. INCREASE COMMUNITY RESILIENCE IN ADAPTING TO URBAN HEAT					
4.1 Implement the awareness and communication action plan from the heatwave planning template for Lake Macquarie.	S	Community Partnerships Environmental Systems	Advice on actions to take during a heatwave provided to community	CSP ESSAP	1, 11, 12, 13
4.2 Work with established community and not-for-profit groups, such as Sustainable Neighbourhoods, Red Cross and other non-government organisations, to promote awareness and distribution of education materials.	S	Community Partnerships Environmental Systems	Education materials distributed	CSP ESSAP	1, 11, 12, 13, 17
4.3 Identify suitable types of locations for respite during heatwaves. Provide guidance material for respite centres detailing operational requirements during a heatwave.	S	Environmental Regulation and Compliance Environmental Systems Community Partnerships	Respite locations identified	CSP	1, 11, 12, 13
4.4 Expand the use of temperature sensors to better understand heat distribution across the city and develop a website to increase awareness with the community.	M	Integrated Planning Community Partnerships	Sensor network expanded	ESSAP	11, 12, 13
4.5 Investigate options to encourage stewardship practises such as Parkcare to maintain green infrastructure such as swales and vegetation.	M	Environmental Systems Community Partnerships	Options to encourage stewardship of a swale or vegetated area investigated	CSP LSPS ESSAP UGS	6, 11, 12, 14, 15

Action	Timeframe	Responsibility	Monitoring/Evaluation outcomes	Strategic links	SDG links
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5. ENSURE COUNCIL ACTIVITIES ACCOUNT FOR RISING TEMPERATURES

5.1 Review activities, sporting guidance and community facilities to include appropriate heatwave planning considerations including temperature and air quality thresholds and humidity considerations, as well as Council responses.	S	Community Partnerships Environmental Systems	Activity, sporting guidance and community facilities reviewed	CSP	11, 13
5.2 Review event guidelines to include appropriate heatwave planning considerations including temperature and air quality thresholds and humidity considerations, as well as Council responses.	S	Arts, Culture and Tourism Environmental Systems	Event guidelines reviewed	CSP	11, 13
5.3 Review volunteer guidelines to include requirements for heatwave and extreme heat conditions (including humidity and bushfire considerations).	S	Community Partnerships People, Culture and Risk Environmental Systems Arts, Culture and Tourism	Volunteer guidelines reviewed		11, 13
5.4 Review the existing and future capital works programs to identify opportunities to incorporate green roof, cool roof and cool pavement pilot projects.	S	Asset Management Environmental Systems	Future capital works program reviewed and opportunities identified	ESSAP	9, 11
5.5 Incorporate climate change considerations including heat resilient design principles into Council's Asset Management Plans.	M	Asset Management Environmental Systems	Climate change considerations incorporated into Asset Management Plans	ESSAP	9, 11, 13

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APPENDIX 1

GUIDANCE TO ADDRESS URBAN HEAT IN DEVELOPMENT

Checklist for development

To assist developers, the following checklist provides guidance for items that may be considered in a development to address urban heat.

- Have you included landscaping features and the use of trees for shading?
- Have you considered a feature such as a green wall or green roof?
- If you are including solar, have you considered co-locating a green roof with the solar?
- Have you chosen a roof colour with high reflectivity?
- Have you incorporated water features in paved and hardstand areas?
- Have you considered window treatments or insulation?
- Have you considered suitable locations for residents to find respite during heatwaves?
- Have you developed a stewardship model for any green spaces such as swales and vegetation?



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