



**Under separate cover attachments: 21SP097
Munibung Hill Management Plan for Exhibition**

Attachment 1: Draft Munibung Hill Management Plan

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Munibung Hill Management Plan

MANAGEMENT AND
ACTION PLAN FOR MUNIBUNG HILL

DRAFT

NOVEMBER 2021



MUNIBUNG HILL DRAFT MANAGEMENT PLAN

Management and Action Plan for Munibung Hill

DRAFT

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Lake Macquarie City Council

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Executive Summary

The **Munibung Hill Management Plan** sets out how Lake Macquarie City Council (Council) will manage access and use of Munibung Hill over the next decade, to protect important natural and cultural values, and provide safe access for passive recreation for people in surrounding communities and further afield in the City.

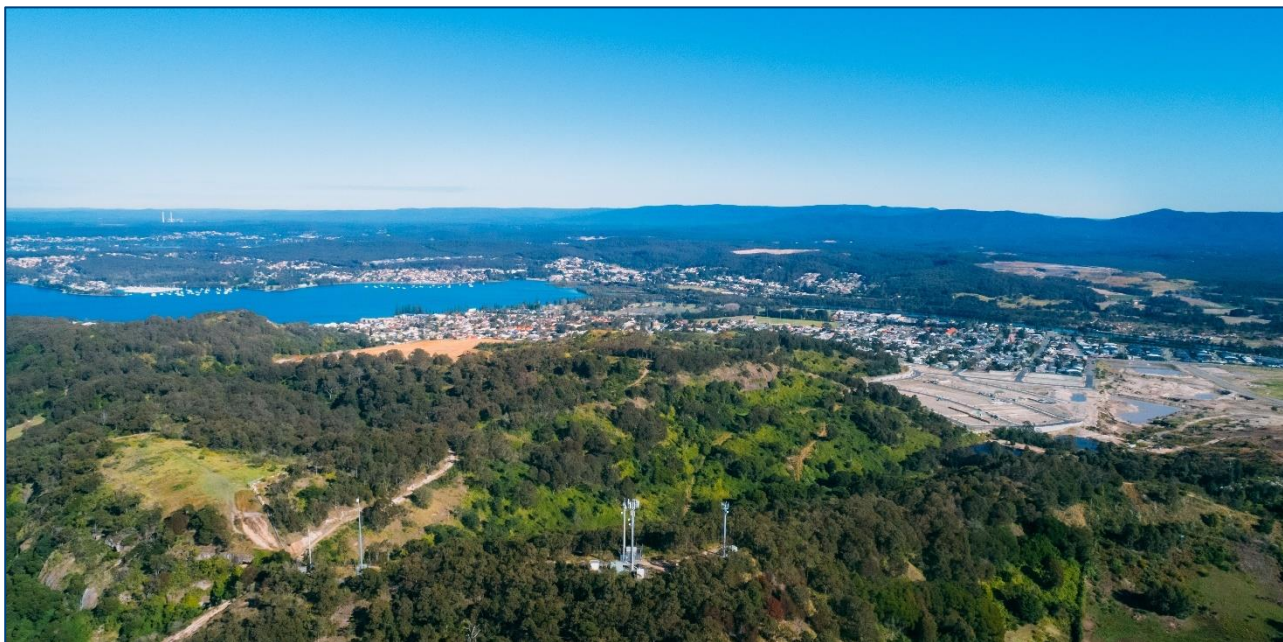
The Management Plan explains how Council will implement a **Concept Plan** which identifies access points, tracks and track uses that are feasible over the next 10 years. The Management Plan and Concept Plan draw on three working documents: context, site analysis and constraints review; community and stakeholder engagement report; and an options analysis which considered the full range of potential access points, tracks and types of recreational use, as well as important areas for conservation.

Vision

Munibung Hill is a visual, environmental, and recreational landmark framing the north of Lake Macquarie. Safe and accessible bushland open space invites people to connect with nature and culture.

Munibung Hill

Munibung Hill is a natural landmark at the northern end of Lake Macquarie. Its elevated ridge crest is surrounded by steep slopes, including cliffs formed in conglomerate and sandstone. Although parts of the hill have been extensively cleared, some remnants of important vegetation communities and species remain. Munibung Hill is an important cultural place for the Awabakal people.



Source: Good Sense Media

For many decades, people from surrounding suburbs have followed tracks to the ridge crest of Munibung Hill, enjoying access to modified bushland and extensive views across Lake Macquarie and surrounding areas. Some of the tracks are on Council land, but some involve uncontrolled access across privately owned land.

Parts of Munibung Hill and surrounding areas were contaminated by the operations of the Pasminco Cockle Creek Smelter and other heavy industry. These industrial uses ceased in 2003 and remediation of lands around Munibung Hill is well advanced. This has enabled transformation of the land use, economic activity and settlement patterns of the former industrial lands and north-western Lake Macquarie.

Strategic and Development Context

Development of the north west growth area and North West Catalyst Area identified in Council's strategic planning is bringing new workers, customers and residents to the area. At the same time, planners recognise the value of local access to diverse open spaces for recreation as a key component of sustainable urban development. Increasing vegetation diversity and canopy cover in urban areas, including intra-urban parkland and bushland open space is an important urban amenity and climate adaptation response. These factors are relevant to Munibung Hill.

Munibung Hill Management Area

The Munibung Hill Management Area is a total of 172.7 hectares (ha). Council owns approximately 67 ha of the Management Area, including Community Land and Operational Land. The Management Plan focuses on this land.

The council land includes a narrow corridor of land along the main north south ridge crest of Munibung Hill, a parcel of land on the northern slopes and linear parcels of land to the east, which connect Munibung Hill to broader district level open space and active transport routes. The eastern land parcel is a key track head access point for Munibung Hill. Council also owns the former quarry site (at the end of Quarry Road, Speers Point). This is proposed as a southern access point.

The Management Plan Area also includes approximately 105 ha of land in private ownership which is currently zoned for conservation, not subject to a rezoning proposal, and contiguous with the Council land. 84 ha of this land is owned by Munibung Hill Pty Limited. It is covered by a Vegetation Management Plan and several existing tracks cross the land, connecting Council owned land off Quarry Road to the north south ridge line. Council will work with the private landholders to secure sustainable conservation, recreation, and development outcomes.

Uses of the Munibung Hill Management Area

The Concept Plan for Munibung Hill for the next 10 years involves conservation of significant natural and cultural values, in combination with strengthening defined opportunities for passive recreation, and controlling access for other recreational activities until risks can be clarified and resolved. Important reasons for the focus of the Concept Plan include:

- The recreation concept is consistent with the values, categorisation, and zoning of public land on Munibung Hill and with currently feasible access options.
- Conservation management reflects significant land capability constraints.
- By meeting the objectives of the E2 Conservation Land zoning under the *Lake Macquarie Local Environment Plan 2014*, the Concept Plan provides for the protection and management of the important natural environment values of Munibung Hill.
- Management of the Council Community Land for conservation is consistent with the categorisation of this land as Natural Area – Bushland, in the city-wide 2011 Plan of Management for Community Land.

Proposed Recreation Access

Two new track head sites are proposed:

- off Blaxland Road in Macquarie Hills, and
- off Quarry Road at Speers Point.

These sites allow for off road parking and trail head facilities such as picnic tables, signage, and toilets.

Council will upgrade tracks to and along the main north south ridge crest from the track head sites. These tracks will provide safe access for independent walkers and other related passive recreation:

- Erosion on tracks will be stabilised.
- Stairs or other features added to align track standards with Grade 4 (on steep slopes) or Grade 3 (on flatter land) of the Australian Walking Track Grading system.
- Hazards associated with steep slopes, cliffs and any potential soil contamination will be managed.
- Track routes will avoid places of Aboriginal cultural value and high conservation value bushland.
- Residents of local suburbs will still be able to access the upgraded tracks using connecting tracks from existing local access points which are on council land. These are often at the end of narrow suburban streets and are not suitable starting points for people arriving by car.

Proposed Management Actions

The Munibung Hill Management Plan recognises that strengthening conservation and providing safe recreational access on Munibung Hill will require further detailed studies and operational planning, to ensure that works are conducted in an environmentally sustainable manner. These detailed planning and design activities will guide remediation and construction works for the track head sites and proposed walking tracks.

High priority actions include:

- Studies to confirm:
 - The contamination status of Council owned land on the ridge crest, so that appropriate track designs can be developed.
 - Priority track erosion sites, so that erosion control works, and track reconstruction tackle the most important places first.
 - Risks associated with pedestrian access to cliff tops.
- Preparation of detailed designs, operational plans, and protocols, including:
 - Detailed track and trail head facility designs, to provide the right level of service in a cost effective and sustainable way.

- A vegetation management plan (VMP) for the Council owned land. This will identify priority locations for ecological conservation works such as invasive species management. It will also provide baseline information to set targets for bushfire management, vegetation condition, canopy cover or other relevant ecological indicators. The VMP will also explore opportunities for collaborative approaches to conservation management across different land tenures.
- Environmental management plan(s) to cover contamination, soil erosion and controls for construction works.
- Access management plan to ensure ongoing access for service providers (including telecommunications towers and bushfire management) and to control illegal access by trail bikes or other off-road vehicles.
- Environmental assessments and approvals for construction works.
- Stakeholder engagement:
 - Engagement management plan, to provide a framework for ongoing council consultation with regulators, adjoining landholders (land developers, residents, and commercial properties), the Aboriginal community and recreational users. This will include discussions with WAMC and adjoining landholders to develop consistent approaches to access, conservation, and other open space land management wherever possible.
 - A specific Aboriginal community engagement plan to protect and promote cultural values. Council intends that engagement with the Aboriginal community will be a key part of respecting the value of Awabakal Country on Munibung Hill. Munibung Hill is subject to an Aboriginal Place nomination, which is being assessed by the NSW Heritage Office. If the nomination proceeds and is gazetted, specific protections and consultation requirements will apply.

What is Not Proposed at this Time

The Management Plan does not provide all-abilities access to paths on Munibung Hill. This is because the steep terrain is not suitable for access without multiple steps. Public vehicle access to the flatter land along the ridge crest of Munibung Hill is not currently feasible.

The Management Plan will not enable mountain bike riding on Munibung Hill. This is because:

- The access tracks onto Munibung Hill requires a steep climb.
- Constructing a track suitable for bike riding would require clearing of a larger area and significant earthworks, including in soils that are potentially contaminated. This is not consistent with protection of the natural and cultural values of Munibung Hill.
- A shared path for walkers and mountain bike riders would increase risks for walkers and potentially create user conflicts.
- Compared to other reserves in Lake Macquarie and Newcastle where mountain bike riding is permitted and encouraged, Munibung Hill is a small area with complex constraints.

Future Investigation Areas

Several parcels of land are identified as **Further Investigation Areas**. They are not part of the Munibung Hill Management Area for this Management Plan. These land parcels may be included in future iterations of the Management Plan, beyond the 10 year life of this Management Plan, subject to issues being resolved to the satisfaction of Council. These land parcels include:

- Land owned and managed by the NSW Waste Assets Management Corporation (WAMC) in the former Pasminco and Incitec Pivot site that is zoned E2 conservation. This land includes the *Angophora inopina* reserve (part of Lot 1004 DP1270101), the land parcel that connects the reserve to the northern end of Munibung Hill (Lot 1010 DP1270101) and Munibung Hill Reserve (Lot 51 DP12296360).
- Land owned by private developers which is contiguous with the Munibung Hill Management Area and is zoned for conservation but where the land parcel is subject to current rezoning and/or development proposals.

Council will continue to liaise with relevant and owners to promote opportunities to include parts of these land parcels in the Munibung Hill Management Area in the future, recognising:

- The recreational value that could be offered, subject to clarification of contamination risks and future roles and responsibilities (for the WAMC land).
- The potential to enhance and secure ecological connectivity.
- Opportunities to enhance visual amenity.
- Additional potential local access points, subject to surrounding development, demand for walking paths from different areas and constraints being manageable.

Acknowledgement of Country

Lake Macquarie City Council acknowledges that Aboriginal people, in this area the Awabakal people, were the first people of this land, and are the proud survivors of more than 200 years of continuing dispossession.

Council recognises that European occupation brought massive changes to the land and its people.

As a vital step towards building a just and common future, Council recognises the sense of loss and the grief held by all Aboriginal and Torres Strait Islander people for the alienation from their traditional land, the loss of freedom, their lives, their languages, their health, and the disruption of their cultural practices. Council respects the rights of all Aboriginal and Torres Strait Islander people to pursue their own values and culture. We pay respect to knowledge holders and community members of the land and waters and pay our respect to Elders past, present and future.

Lake Macquarie Aboriginal Community Plan 2019-2023

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1.0 Introduction and Management Framework

Lake Macquarie City Council (LMCC or Council) has prepared this Management Plan for Munibung Hill with the assistance of Umwelt (Australia) Pty Ltd.

The Management Plan will be implemented by Council in consultation with the local community, other landholders, the Aboriginal community, and relevant regulatory authorities.

1.1 Purpose

The Management Plan and supporting documents confirm Munibung Hill as a local and regional scale recreational natural space, but also identify important land tenure and land capability issues to be carefully managed and cultural and conservation values that must be protected. It provides Council and other landholders with a clear planning framework, prioritised actions and roles and responsibilities to support the site's continued value to the community. It clarifies the proposed access arrangements, land use and land management on Munibung Hill over the next 10 years.

The Management Plan provides LMCC and other landholders with a clear planning framework, prioritised actions and roles and responsibilities to support the site's continued value to the community.

The Management Plan and supporting documents confirm Munibung Hill as a local and regional scale recreational space, but also identify important land tenure and land capability issues to be carefully managed and cultural and conservation values that must be protected.

The Munibung Hill Management Plan has been prepared to:

- Consolidate knowledge about the significance of constraints and opportunities to future use of the area.
- Identify appropriate future land uses on Munibung Hill, which reflect its strategic location, its land capability, and natural, social and cultural values.
- Develop a program of works, studies and consultation which will support the delivery of safe recreational opportunities for the people of Lake Macquarie, while protecting important natural and cultural values. This program or management action plan identifies priority management actions for tracks and access points, roles and responsibilities for implementation and indicative investment requirements for Council. It identifies future investigations and consultation with landholders to clarify the feasibility of recreational opportunities beyond those identified for the next 10 years.

1.2 Why the Management Plan is Needed

Munibung Hill is situated at the northern end of Lake Macquarie and is an important physical, social, cultural and visual landmark in the lower Hunter Region. The ridgelines and upper slopes of Munibung Hill are currently modified 'natural' open space and mostly vegetated.

People from surrounding local communities currently visit Munibung Hill for recreation – including walking and related passive recreation, and bike riding. Community recreational preferences are changing, but access to bushland open space in urban areas continues to be important. Current urban design principles place high value on accessible open space suitable for a range of uses, to support the wellbeing of communities (see NSW Government Architect 2020).

LMCC recognises the recreational potential of Munibung Hill, as a large area of open space, centrally located in a growing regional community. Munibung Hill is a strategic 'open space' asset for the City.

Council's Local Strategic Planning Statement (LSPS) 2020 highlights the contribution of outdoor spaces to the liveability of the City, providing diverse and quality places for people to connect with others, enjoy nature, relax and get active. Munibung Hill lies within the North West Growth Area and North West Catalyst Area of the City (LSPS 2020). It is central to both Lake Macquarie and Newcastle growth areas, where accessible open space for recreation combines with employment opportunity to enhance liveability.

The *Developer Contributions Plan: Recreation and Land Plan Glendale Contributions Catchment 2015-2030* (LMCC 2016) identified funding for investigations and detailed planning to clarify the future recreational opportunities on Munibung Hill and Council has completed preliminary analysis of tracks and land tenure arrangements to better understand how open space on Munibung Hill can contribute to liveability and lifestyle.

The management of open space on Munibung Hill is challenging for several reasons. These include:

- The landforms of the area include steep and potentially unstable slopes and cliffs. While the elevated ridgelines offer expansive views, there are also safety issues associated with ongoing uncontrolled access to dangerous landform features.
- There are multiple existing tracks and trails, that have long been used by local people. Many of these are in poor condition (refer to **Photo 1.1**), with severe erosion contributing to off-site impacts on water quality and on-site safety issues.
- The condition of the area has been impacted by pollution and contamination from historical heavy industry. Uncertainty remains about the extent and nature of contamination on public land.
- The area is affected by disturbance from quarrying and land clearing and by the 'edge effects' of being surrounded by urban development. These include invasive plant and animal species, clearing and encroachment of private uses onto public land, and some illegal access by trail bikes and motor vehicles.
- Five suburbs have borders with Munibung Hill (Boolaroo, Speers Point, Lakelands, Warners Bay, and Macquarie Hills). Over the next two decades, significant population growth is projected in this area (which is within the North West Catalyst Area for the City), as new greenfield suburbs are developed, and population density increases around economic centres such as Glendale. The former Pasminco and Incitec industrial sites on the footslopes on Munibung Hill are being transformed to residential and employment uses, increasing the presence of people in the area and the pressure on access points to areas of open space.
- LMCC owns and manages only part of the land on Munibung Hill, as Community Land and Operational Land. The Community Land is classified as Natural Area – Bushland in Council's Community Land Plan of Management.
- Munibung Hill has complex and evolving land tenure. There are 51 landholdings across Munibung Hill and surrounding land through which access to Munibung Hill is obtained. The ownership and zoning of privately owned land are changing as remediation of former industrial and quarry sites is completed, enabling new land uses. Access to a number of tracks currently used by the community is across private land, creating legal and liability issues.

- Munibung Hill is a culturally important place for the Awabakal people. There are a number of cultural sites on the Hill and a nomination to have Munibung Hill gazetted as a statutory Aboriginal Place was lodged with the NSW Heritage Office in 2020. The application remains under assessment (September 2021).
- Despite historical impacts on vegetation, Munibung Hill retains important biodiversity values, with a threatened ecological community and several threatened species associated with the specific geology and landform context of the place.

The land management and recreational planning process for Munibung Hill is complex and has significant uncertainties because of the interaction of:

- Complex biophysical and land capability constraints.
- Important cultural and biodiversity values.
- Changing demographic character and land use context.
- Dynamic community values for recreational open space.



Photo 1.1 Some of the Steep and Eroded Tracks on Munibung Hill

1.3 Planning Process Overview

Figure 1.1 provides an overview of the phases that have guided development of the draft Management Plan, from data compilation and analysis to development of use and design concepts aligned with the values and constraints, to a draft Management Plan and implementation arrangements.

The draft Management Plan will be updated and finalised after exhibition. The exhibition will provide opportunities for further community feedback.

The draft Management Plan is informed by four working documents:

- Munibung Hill Site Context, Values and Constraints Report (Umwelt 2021a). Key outcomes of the values and constraints analysis are outlined in **Section 3.0** of the Management Plan.
- Stakeholder and community engagement report (Umwelt 2021b). This documents consultation with Council staff and key stakeholders, which was conducted to enhance understanding of values and constraints (informing the analysis in **Section 3.0**) and to clarify risks and opportunities that are balanced in the options Analysis and Concept Plan.
- Munibung Hill Options Analysis (Umwelt 2021c). Strategic management directions for Munibung Hill and options considered to respond to these directions are discussed in **Section 5.0**.
- Munibung Hill Concept Plan (Umwelt 2021d). Key components and rationale for the Concept Plan for the next 10 years are outlined in **Section 4.0**. **The Management Plan identifies how Council will deliver this Concept Plan.**

In addition, a preliminary review of recreation and tourism opportunities was prepared by SMA. This specialist review contributed to the site context, values, and constraints analysis and findings were presented to council staff during workshops conducted during the development of strategic site management options and the Concept Plan.

1.4 Community and Stakeholder Involvement in the Development of the Management Plan

Residents, landholders, recreational users, Council officers and others with an interest in the management of Munibung Hill contributed to the development of the Management Plan through:

- Personal interviews with landholders, land managers and community organisations with an interest in Munibung Hill. Interviews were conducted to raise awareness of the project, clarify the existing situation and landholder plans, and to obtain feedback about management options.
- Consultation with public authorities having a planning or regulatory role. Examples include the NSW Heritage Office, which is currently reviewing an Aboriginal Place nomination for Munibung Hill and the NSW Environment Protection Authority (EPA), which has regulatory oversight of pollution and contamination.
- Online survey, inviting input from the general community.
- Social pinpoint map tool, also inviting input from the general community, about the uses and values of specific places on Munibung Hill.

- Emailed survey, to increase accessibility of the survey instrument.
- Council social media platforms, reminding people that their input and feedback would be welcome.
- Simon McArthur and Associates (SMA) literature review and participation in discussion of options and constraints, to provide information about the potential for recreation-based tourism activities.
- Council staff interviews, to clarify data, issues, partnerships, and management approaches that have been considered by Council.

Aboriginal community stakeholders participated in the planning process. This included an inspection of Munibung Hill that highlighted its significant cultural and archaeological value. The Aboriginal community stakeholders were also consulted on the Concept Plan and will be consulted about the Management Plan. Information about Aboriginal cultural value is in **Section 3.4** of this Management Plan.

Details of community involvement and analysis of the input are in the Community Engagement Report (Umwelt 2021d) and the results are summarised in **Appendix A**.



Figure 1.1 Development of the Munibung Hill Management Plan

1.5 Land Covered by this Management Plan

The study area for the Management Plan commenced with 331.2 ha and over 51 separate landholdings, which included the ridgelines and slopes of Munibung Hill and adjacent land forming the context of Munibung Hill. The Site Analysis, Values and Constraints Report (Umwelt 2021a) covered this broad study area.

While Council owns and manages about 67 ha of the study area, land tenure and ownership of the study area is constantly changing. Over the past 5 to 10 years and likely over the next decade, rezoning and new development is expected to proceed in the Boolaroo area and adjacent privately owned area.

1.5.1 Land Included in the Management Area

Following the preparation of the Site Analysis, Values and Constraints Report (Umwelt 2021a) and engagement with landholders, Council identified a smaller, defined area to be the focus for management over the next 10 years. This is because significant constraints and/or uncertainty about access to some parts of the broader study area limit the area where detailed management planning for recreational access is feasible. This area of focus is referred to as the Munibung Hill Management Area. It is defined in the Concept Plan for Munibung Hill (Umwelt 2021c). The draft Management Plan relates to the land included in the Munibung Hill Management Area.

The Munibung Hill Management Area is shown in **Figure 1.2**.

The Munibung Hill Management Area covers about 172.7 ha including:

- Land owned and managed by LMCC as Community Land or Operational Land under the *Local Government Act 1993*. Council land covers about 65.6 ha or 38% of the Munibung Hill Management Area. It includes a narrow corridor of land along the main north south ridge crest of Munibung Hill, a parcel of land on the northern slopes and linear parcels of land to the east, which connect Munibung Hill to broader district level open space and active transport routes.

The eastern land parcel is a key track head access point for Munibung Hill. Council also owns the former quarry site (at the end of Quarry Road, Speers Point). Only some of the local access points and tracks currently used by people visiting Munibung Hill for recreation purposes are on Council land.

One small parcel of Council land that was in the original study area (1.2 ha) is excluded from the Munibung Hill Management Area but included in the Investigation Area and a further 0.2 ha of Council land is excluded.

- Land parcels owned by Munibung Hill Pty Limited, which cover about 84 ha or 49% of the Munibung Hill Management Area. Only those parts of this private land that are currently zoned for conservation and subject to a vegetation management plan, are included in the Concept Plan and Munibung Hill Management Area. Land currently zoned for environmental living has been excluded. Several existing tracks cross this land, connecting Council owned land off Quarry Road to the north south ridge line.
- The remaining 13% of the Munibung Hill Management Area is privately owned land that is currently zoned for conservation and are contiguous with Council land.

1.5.2 Munibung Hill Management Area Land Ownership

Council identified 51 separate lots across the study area. Land tenure and ownership of areas of Munibung Hill is continuing to evolve.

Land tenure across the Munibung Hill Management Area and adjacent land is shown in **Figure 1.2**. In combination, land owned by Council and Munibung Hill Pty Limited comprises the majority of the Munibung Hill Management Area.

A full list of properties from the broader study area is provided in **Appendix B**.

1.5.3 Leases within the Munibung Hill Management Area

There are several leases held within the Munibung Hill area that are currently held by various telecommunication authorities which cover several telecommunication towers located within the Management Area across different land parcels (refer to **Table 1.1**).

Table 1.1 Leases

ID	Address	Owner	Lease Holder
1	26A Farm Street, Speers Point	LMCC	Optus
2	1A Raymond Street, Speers Point	Munibung Hill Pty Ltd	Vodafone
3	149 Fairfax Road, Warners Bay	LMCC	Motorola
4	149 Fairfax Road, Warners Bay	LMCC	Motorola
5	2A Fourth Street, Boolaroo	Waste Assets Management Corporation (WAMC)	Broadcast Site
6	2A Fourth Street, Boolaroo	WAMC	Energy Australia
7	2A Fourth Street, Boolaroo	WAMC	Combined CMTS site
8	2A Fourth Street, Boolaroo	WAMC	CountryTell
9	2A Fourth Street, Boolaroo	WAMC	Energy Australia

Easements allow essential services such as water or electricity to access property held by a private landholder. Several easements are in place in the Munibung Hill Management Area, including an electricity easement that previously serviced the PCCS and the Incitec Pivot Fertiliser Site, which remains in the north of the Munibung Hill Management Area. In addition, there are a number of fibre optic cables beneath easements that connect across Munibung Hill from Boolaroo to Macquarie Hills and from Boolaroo to Argenton.

1.5.4 Future Opportunities on Land Excluded from the Munibung Hill Management Area

Several parcels of land have been excluded from the Munibung Hill Management Area for this Management Plan. These parcels of land are identified below. They have unsuitable land capability, or contamination or land tenure and planning issues.

1.5.4.1 Land Excluded from the Munibung Hill Management Area

Land excluded from the Concept Plan and Munibung Hill Management Area (refer to **Figure 1.2**) includes:

- Parts of privately owned land, contiguous with the Council land, that are not zoned for conservation.
- The containment cell (Lot 1005 DP1270101) in the former Pasminco site.
- Land parcels owned by private developers and Hunter Central Coast Development Corporation (HCCDC) that are currently being developed for commercial or residential uses. This land includes the former Hawkins Quarry site which is currently being developed as a residential estate, and parts of the former Pasminco and Incitec sites that are owned by HCCDC, Green Capital and Costco. Tenure arrangements, zoning and detailed subdivision planning are progressing on this land.

Council will continue to promote opportunities for access for public recreation within and from the new residential estates through the subdivision and development consent process.

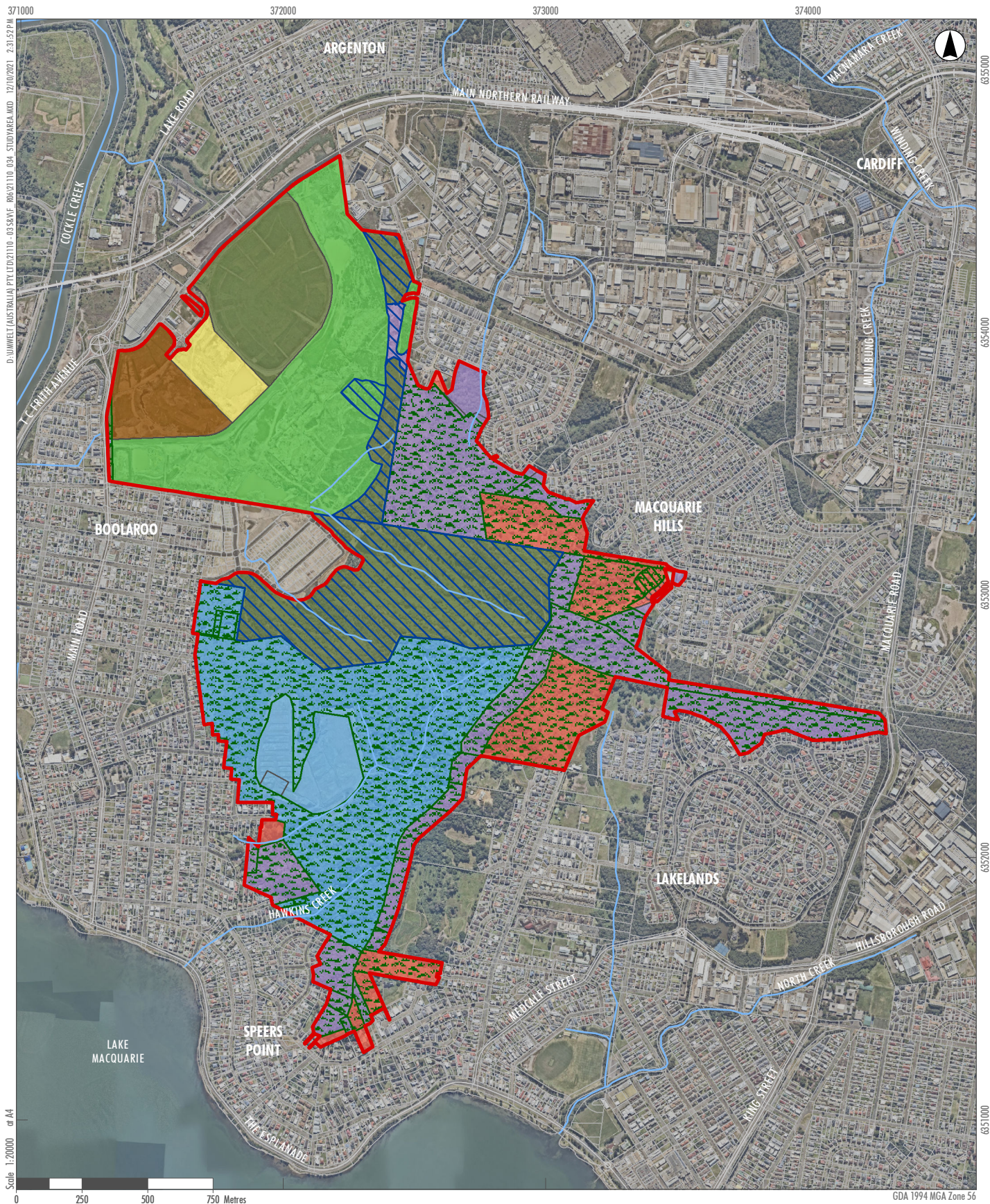
- Future Investigation Areas (see **Section 1.5.4.2**).

1.5.4.2 Future Investigation Areas

Several parcels of land are identified as Further Investigation Areas (see **Sections 2.4** and **4.0**). **They are not part of the Munibung Hill Management Area for this Management Plan.** These land parcels may be included in future iterations of the Management Plan, beyond the 10 year life of this Management Plan, subject to issues being resolved to the satisfaction of Council.

These land parcels include:

- Land owned and managed by the NSW Waste Assets Management Corporation (WAMC) in the former Pasminco and Incitec Pivot site that is zoned E2 conservation. This land includes the *Angophora inopina* reserve (part of Lot 1004 DP1270101), the land parcel that connects *Angophora inopina* reserve to the northern end of Munibung Hill (Lot 1010 DP1270101) and Munibung Hill Reserve (Lot 51 DP12296360). Council will liaise with WAMC about future potential inclusion of this land in the Munibung Hill Management Area to recognise the recreational value that could be offered, subject to clarification of contamination risks and future roles and responsibilities.
- Land owned by private developers contiguous with the Munibung Hill Management Area which is zoned conservation but where the land parcel is subject to current rezoning and/or development proposals.
 - Access opportunities and constraints through these land parcels are discussed in the Munibung Hill Options Analysis (Umwelt 2021c)
 - Council will continue to promote opportunities for inclusion of these lands to recognise the values that they would add to the Management Plan vision through providing vegetated corridors and visual amenity.
- Other potential local access points may also be considered in the future, subject to surrounding development, demand for walking paths from different areas and constraints being manageable.



Legend

- Group A - Study Area
- Management Plan Area
- Further Investigation
- Land Ownership**
- Costco
- Green Capital Group
- Hunter and Central Coast Development Corporation (HCCDC)
- Lake Macquarie City Council (LMCC)
- Munibung Hill Pty Ltd
- Private
- NSW Waste Assets Management Corporation (WAMC)

FIGURE 1.2

Munibung Hill Management Area

2.0 Strategic Framework for Management

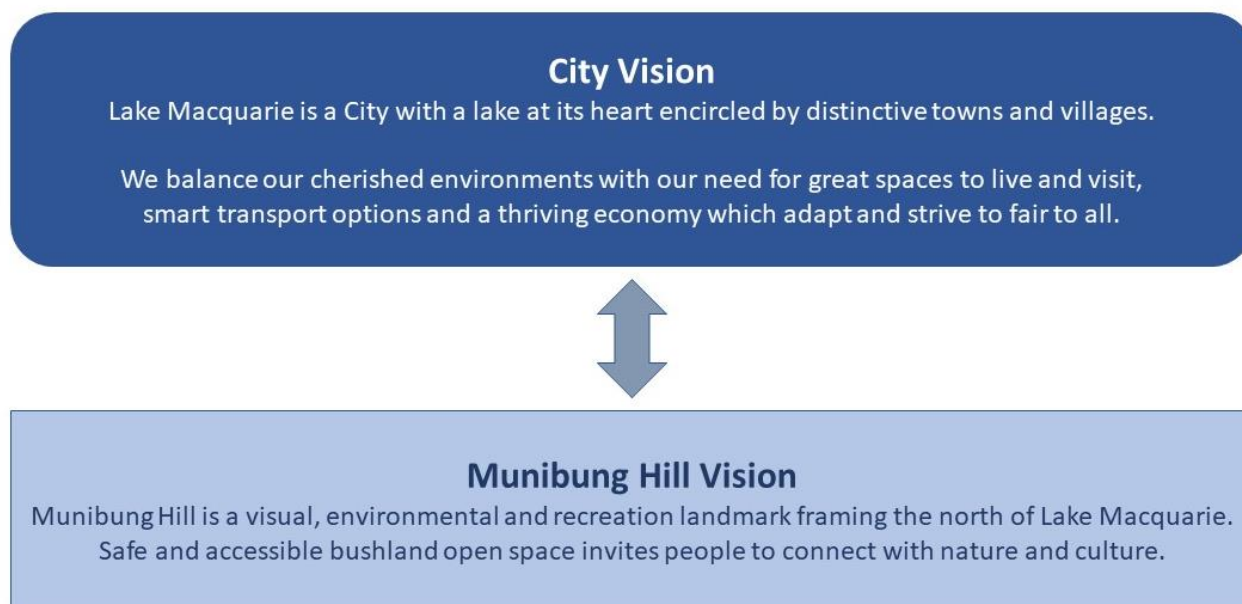
This section defines the guiding framework for management of Munibung Hill. The framework includes:

- Vision
- Principles
- Management Objectives
- Strategic approach and Concept Plan

The framework incorporates strategic guidance from local and regional plans, integrated with information about the strategic values and risks associated with Munibung Hill. Supporting information on local strategic planning context is outlined in **Section 2.1**. Supporting information on specific environmental, social, and cultural values and risks associated with Munibung Hill is discussed in **Sections 3.1, 3.2 and 3.3**.

2.1 A Vision for Munibung Hill

The vision for Munibung Hill translates the Lake Macquarie City Vision (as defined in the Community Strategic Plan (CSP) and Local Strategic Planning Statement (LSPS)) to the specific natural (environmental), cultural and social values of the Hill and its context.



The vision statement encompasses the value of future conservation, recreation, and tourism and how these contribute to a sense of place, liveability, and wellbeing for the community.

Understanding of these values and their significance is based on a review of existing planning documents and consultation with stakeholders during the development of the Context, Values and Constraints Report (Umwelt 2021a) and the Concept Plan (Umwelt 2021d). Community input is documented in the Engagement Report (Umwelt 2021b).

Table 2.1 shows the relationship of Munibung Hill values to the city-wide values articulated in the CSP and LSPS.

Table 2.1 City Values from CSP 2016 and LSPS 2019

City Values	Description	Munibung Hill Value and Potential Contribution
Our Unique Landscape	A place where the natural environment (bushland coast, lake, and mountains) is protected and enhanced; where our existing urban centres are the focus of our growth, maintaining their unique characteristics.	Munibung Hill is part of the bushland environment of the City. It is an important and highly visible natural feature, occupying the skyline to the north-west of the lake. Bushland on Munibung Hill is recovering after many decades of severe impacts; it retains important environmental conservation values including threatened ecological communities and species. Conservation is a key focus of the Management Plan.
Lifestyle and Wellbeing	A place that encourages safe, active, and social opportunities.	The community has told us that they enjoy visiting Munibung Hill for walking for fitness or with family or their pets and sometimes for bike riding. Bushland context and views are both important. Some currently used tracks have safety risks and some cross private property. The Management Plan focuses on making selected tracks safe and on providing access on public land. It aims to encourage increased, controlled, and safe use, while protecting important cultural and biodiversity values.
Mobility and Accessibility	Effective transport systems that provide options to conveniently move people, goods, and services.	This is not directly related to the management of Munibung Hill. There is an indirect connection through linking access points for recreation on Munibung Hill to the City's active transport network and to public transport and providing trail head parking areas.
A Diverse Economy	Which is resilient and adaptable to change, making the best use of the unique advantages of our location and lifestyle.	Recreational access to Munibung Hill contributes to the City's lifestyle. The potential for economic benefits through access to Munibung Hill for tourism was investigated in the Context, Values and Constraints Report (Umwelt 2021a, SMA 2021). The constraints affecting Munibung Hill mean that in the short to medium term, there are limited tourism or economic diversification opportunities associated with recreational access.

City Values	Description	Munibung Hill Value and Potential Contribution
Connected Communities	Priorities that support and care for all and provide a sense of belonging.	<p>A number of local stakeholders have referred to this connection to Munibung Hill over a lifetime of accessing the slopes and ridge crest for informal recreation. Munibung Hill is a visual landmark, which can be seen for many parts of the City. The potential to provide access for all (i.e. suitable for all levels of ability) has been investigated.</p> <p>The slopes of Munibung Hill are very steep. There are two vehicle tracks which provide access to the ridge crest. These are also steep, narrow, unsealed tracks which are not suitable for general community access. Upgrading these tracks to allow two-way traffic and parking areas would be counter to protecting biodiversity and cultural values of the place.</p> <p>The Concept Plan and Management Plan do not propose provision of access for all abilities to the elevated land at Munibung Hill. All walking path approaches to Munibung Hill are steep and require a good level of agility – similar to bush tracks in national parks and on Crown land.</p>
Creativity	Working together with creative processes and outcomes that bring together history, culture, knowledge, and expertise that supports new technologies and ways of thinking.	<p>The Context, Values and Constraints Report (Umwelt 2021a) highlights how the natural landscape features of Munibung Hill are connected to the history of its use and the cultural value of the place.</p> <p>Technology offers the potential of new ways of providing information and interpretation for visitors to Munibung Hill.</p>
Shared Decision-Making	Lake Macquarie communities continue shared responsibility for governance.	<p>The Management Plan draws on information from community, business and government stakeholders, through engagement activities associated with the Context, Values and Constraints Report (Umwelt 2021a) and Concept Plan (Umwelt 2021d).</p> <p>Section 4.1 of the Management Plan outlines how stakeholder engagement will continue during the delivery of the Management Plan, including with the Aboriginal community, local landholders and community users.</p>

2.2 Management Principles

Table 2.2 lists the principles that guide the application of the Vision statement in the Management Plan. Council defined these principles to align with the four pillars of sustainability that are the basis of Council's Environmental Sustainability Strategy and Action Plan (ESSAP) 2019. The ESSAP also maps the sustainability pillars and Council projects to the United Nations Sustainable Development Goals.

The management principles in **Table 2.2** are organised in relation to the four Sustainability Pillars.

Table 2.2 Principles Guiding the Munibung Hill Management Plan

Sustainability Pillar	Guiding Principles
Environment	<ul style="list-style-type: none"> Recognise biodiversity values and management to improve values. Protect and manage the ridgelines and steep slopes to protect scenic values from and to Munibung Hill. Recognise that contamination issues and management of downstream impacts need further investigation to inform future use options particularly for active recreation and tourism.
Social	<ul style="list-style-type: none"> Safety of all users is a priority. This includes erosion of tracks, steep slopes, geological and contamination risks. Recognise that Aboriginal cultural values are a key determinant of future use and access planning. Maximise opportunities for inclusiveness and accessibility. Stage development of access. In the first instance, plan for local and regional users with potential to expand capacity to accommodate future tourism opportunities. Facilities to support recreational use must be acceptable to the community and focused on user needs. Recreation development on Munibung Hill should increase participation opportunities within the LGA. There should be a clear balance between recreational use, tourism opportunities and environmental protection and management.
Economic	<ul style="list-style-type: none"> Adaptability to cater for change and maturation in use. Sustainable management of facilities. Facilities maintained at a level commensurate with hierarchy, standard of activity and resources. Equitable distribution of Council resources. Implementation of industry best practice.
Governance	<ul style="list-style-type: none"> Diverse land ownership and competing objectives need to be considered in access and uses. Sustainable governance demonstrates transparency, fairness, ethical practices, and accountability. Council will promote effective public, public private and civil society partnerships.

2.3 Strategic Approach

The Management Plan is based on a strategic approach that incorporates a staged and evidence led process of:

- ecological restoration and ground surface stabilisation to protect values and reduce threats and risks
- cultural heritage protection
- safe recreation development.

The constraints and issues to be resolved for Munibung Hill (see **Section 3.0**) mean that developing recreational opportunities to their full potential will take time.

The goal for Munibung Hill for the next 10 years is to:

Restore natural areas and engage with the Aboriginal community about protecting cultural values, to develop safe, stable, well managed tracks for passive recreation, primarily on Council land.

This goal underpins the 10 year concept plan for Munibung Hill. The vision, goals, and concept plan for Munibung Hill will be reviewed after 10 years.

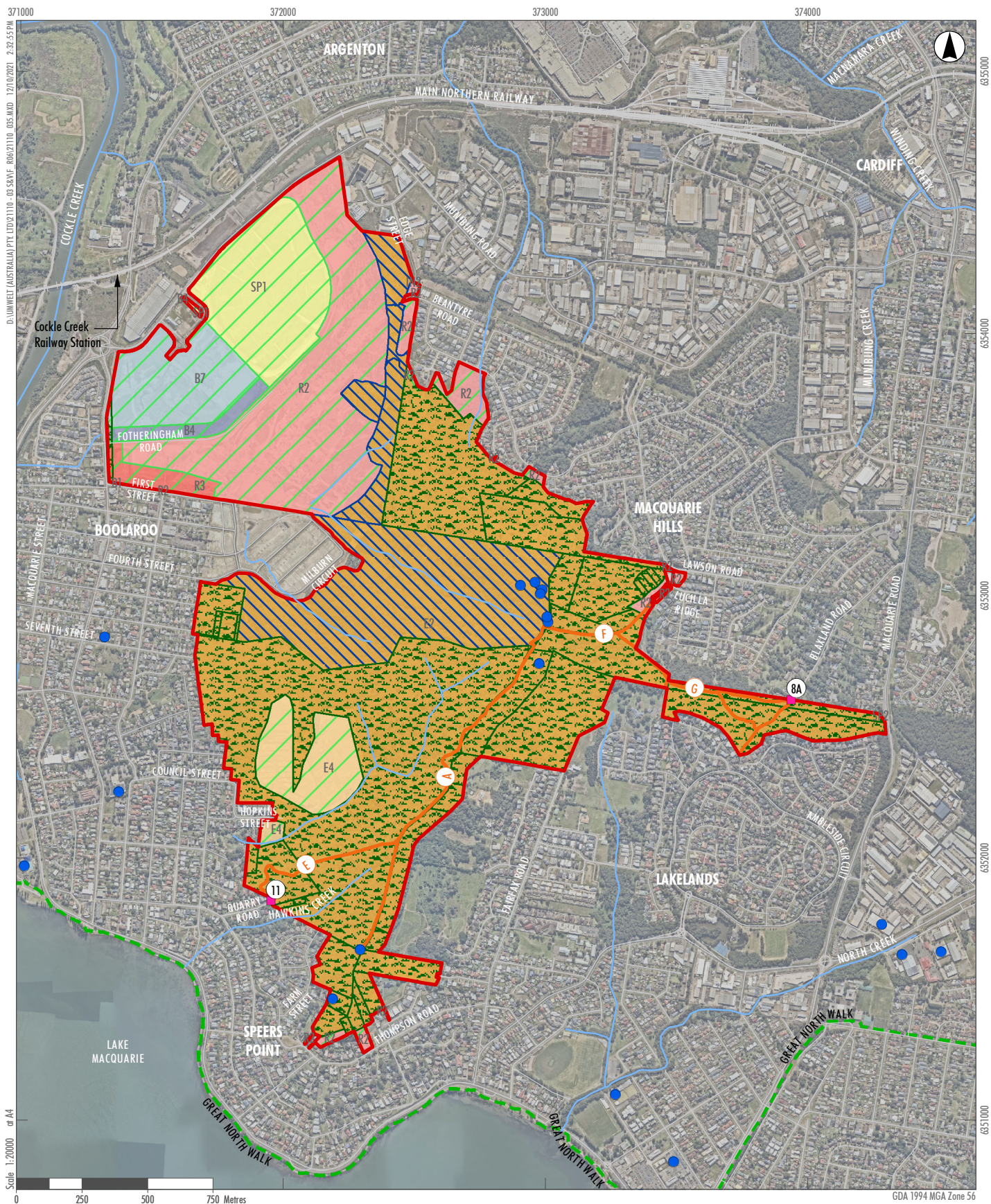
The 10 year Concept Plan is illustrated in **Figure 2.1** and elements of the concept are summarised in **Figure 2.2**. Details of conservation and recreation elements of the Concept Plan are in **Section 2.4**.

A possible **long-term goal**, beyond 10 years, is to move towards:

A recreation hub in a natural setting, that provides quality open space and diverse recreation opportunities for the growing population of the North West Catalyst Area and other residents of Lake Macquarie and attracts visitors with low impact tourism activities.

Management will move towards the long-term goal only when significant constraints and uncertainties have been resolved.

The long-term goal will continue to include passive recreation for people living in local communities and the wider city. In addition, it is envisaged that in the future, subject to further investigation of contamination limitations and clarification of land tenure arrangements for access points and tracks, the diverse recreation opportunities could include more options for people with mobility difficulties. It is possible that in the long term, recreational use could include some active recreation and tourism opportunities.



Legend

- Group A - Study Area
- Great North Walk
- Telecommunication Towers

Zoning

- B1 Neighbourhood Centre
- B4 Mixed Use
- B7 Business Park
- E2 Environmental Conservation
- E4 Environmental Living
- IN2 Light Industrial
- R2 Low Density Residential
- R3 Medium Density Residential
- SP1 Special Activities
- SP2 Infrastructure

Concept Plan

- Management Plan Area
- Potential Access Location
- Passive Recreation
- Excluded Lands
- Further Investigation

FIGURE 2.1

Concept Plan



Figure 2.2 Elements of the Concept Plan and Future

2.4 Concept Plan Elements

The Concept Plan for Munibung Hill for the next 10 years involves conservation of significant natural and cultural values, in combination with strengthening defined opportunities for passive recreation, and controlling access for other recreational activities until risks can be clarified and resolved.

The Munibung Hill Management Plan explains how the Concept Plan will be delivered.

Those areas of Munibung Hill where conservation management (**Section 2.4.1**) and passive recreational access (**Section 2.4.2**) will be promoted are shown in **Figure 2.1**.

The proposed recreation concept is consistent with the values, categorization, and zoning of public land on Munibung Hill and with currently feasible access options.

Management of the Council Community Land for conservation is consistent with the categorisation of this land as Natural Area – Bushland, in the city-wide Plan of Management for Community Land.

Conservation management reflects land capability constraints. By meeting the objectives of the E2 Conservation Land zoning under the Lake Macquarie Local Environment Plan 2014, provides for the protection and management of the important natural environment values of Munibung Hill.

2.4.1 Conservation

Conservation management of Munibung Hill is already provided for in the existing land use zoning of the majority of the Management Area as E2 Environmental Conservation lands, under the Lake Macquarie Local Environment Plan (LEP) 2014, and the identification of Sensitive Aboriginal Landscape Area over the ridgelines and steep slopes of the area.

The specific values to be protected by a conservation approach to land use and management include:

- Mapped Sensitive Aboriginal Cultural Landscape areas, known sites and cultural values and connection.
- Native vegetation and the key ecological corridors providing connectivity to adjacent remnants.
- The vegetated ridgeline extending from Munibung Road in the north through to the lake in the south; and the east and west ridgelines have significant visual, landscape and connectivity values.
- Lowland Rainforest Threatened Ecological Community.
- Threatened species habitat particularly associated with the critically endangered scrub turpentine (*Rhodamnia rubescens*), the powerful owl (*Ninox strenua*) and micro-bat roosting habitat.
- Mapped biodiversity values land associated with riparian habitat values of Hawkins Creek.
- Ecological connectivity to surrounding bushland corridors and land parcels.

Management will focus on protection and enhancement of natural values and will include passive and active vegetation rehabilitation, weed management and soil conservation works to halt further erosion impacts.

2.4.2 Passive Recreation

Informal recreational activities are popular for all ages. Passive recreational activities include walking for exercise or to explore and enjoy the natural environment, walking the dog, jogging, picnicking/BBQs and playgrounds.

These passive recreation activities may be undertaken by individuals or by small groups. Passive recreation is usually independent recreation, although it may be organised by clubs or groups of friends.

The main opportunities for passive recreation on Munibung Hill are focused on walking along existing tracks. It is not proposed to include playgrounds on Munibung Hill.

The pedestrian tracks are unsealed gravel paths which vary in width and length. They have steep sections, with loose surface gravel and are often highly eroded with deep rills on and adjacent to the track (refer to **Photo 1.1**). The tracks are not compliant with the Australian Standards and guidelines for pedestrian tracks in natural areas or parks nor LMCC engineering guidelines.

Some existing pedestrian tracks are also likely to traverse private land with access largely uncontrolled and land boundaries not clear to users.

Mountain bike cycling is not included in passive recreation. Council does not propose to enable mountain bike riding on Munibung Hill. Construction of tracks suitable for mountain biking would involve:

- An expansion of ground surface disturbance to construct tracks that are resilient to intensive use by bikes.
- Increased risks to Aboriginal cultural values.
- Increased risks to recovering vegetation.
- Management of potential conflicts between walkers and bike riders, on steep slopes and/or narrow tracks.

Munibung Hill is traversed by a network of formal and informal walking tracks and vehicular trails which have been constructed to support past and current land use.

Existing vehicle trails on Munibung Hill include service trails within the former Pasminco land holding (now WAMC land). These provide access to air quality monitoring sites and access for WAMC personnel for other contamination testing, weed management and fire hazard control. One trail through WAMC land and a second through land owned by Munibung Hill Pty Limited provide access for intermittent service of telecommunication towers at two locations along the main north south ridgeline (locations are shown in **Figure 2.1**). These trails are not intended to provide vehicle access for the public. They are narrow and steep, suitable for very infrequent and controlled vehicle use.

2.5 Management Objectives and Targets

Applying the Vision and management principles, council has identified fifteen management objectives to focus management activities over the next ten years. Measurable targets for each management objective will enable council to monitor and report progress. Objectives and targets are shown in **Table 2.3**.

The values of Munibung Hill are natural environment, social and cultural. Five management objectives and associated targets are proposed for the environmental pillar of the ESSAP. Four management objectives and associated targets relate to the social pillar in Council's ESSAP.

Economic and governance objectives and associated targets support efficient and inclusive management.

Two management objective and related targets are proposed for the economic pillar in ESSAP. Four management objectives and targets are proposed for governance, recognising the dynamic complexity of land ownership and strategic planning controls.

Table 2.3 Management Objectives and Targets

Sustainability Pillar	Management Objectives	Management Targets
Natural Environment	1. The condition and connectivity of ecological communities on Munibung Hill is improved.	Target (T) 1a. The area impacted by priority weed species (Weeds of National Significance) decreases in the more significant ecological communities. T1b. The area of canopy cover increases by 2032, providing improvement in vegetation linkages across Munibung Hill. Note: these targets will be refined when the Vegetation Management Plan for Council land on Munibung Hill has been prepared and more information is available about baseline condition and feasible improvements, aligned with council's broader urban tree canopy targets.
	2. On and off-site impacts of erosion on Munibung Hill are reduced.	T2a. Severely eroded track surfaces on designated tracks is stabilised. An assessment and prioritisation process for erosion control on tracks is completed within 2 years. All tracks designated in the Concept Plan have stable surfaces by 2032. T2b. Sediment load in runoff from Munibung Hill to Lake Macquarie is reduced.

Sustainability Pillar	Management Objectives	Management Targets
	3. Contamination risks for more diverse recreational use of Munibung Hill are clarified, and safe recreational opportunities are confirmed.	T3a. Contamination risks on designated tracks (Concept Plan) are confirmed to be at safe levels by 2023. T3b. The contamination status and recreational potential of land managed by WAMC (outside the Concept Plan and Management Area, but in the Investigation Area) is confirmed by 2027.
	4. Threatened and endangered species and ecological communities are protected from inappropriate fire regimes, supporting the recovery of biodiversity values. 5. Mitigate the contribution of Munibung Hill to fire risks in surrounding urban areas and mitigate risks from fire for people participating in recreation on Munibung Hill.	T4 and T5. Accessing and responding to unplanned fires on Munibung Hill is made easier, resulting in a declining area impacted by unplanned fires.
Social and Culture	6. Identified walking tracks are safe and stable.	T6. Identified walking tracks meet Australian standards for Level 3 or Level 4 tracks by 2032. Walking tracks on Munibung Hill will not provide all ability access.
	7. The number of recreational users using designated tracks increases.	T7. By 2032, there is a 20% increase in the number of people walking on the designated tracks on Munibung Hill. Note: improving baseline data on usage is included in the Action Implementation Plan (Section 5).
	8. Aboriginal cultural values are protected.	T8. The Aboriginal community is involved in the design and management of access to protect culturally important places is satisfied that recreational use is not compromising cultural values. This would be measured using information from consultation with Aboriginal community stakeholders.
	9. Vehicle access on Munibung Hill is restricted to essential service, maintenance and emergency vehicles.	T9a. By 2023, Council and adjoining landholders agree on ongoing service vehicle access tracks. T9b By 2025, access is controlled at access points that are currently used for illegal vehicle access.
Economic	10. Capital and maintenance costs for recreational access on Munibung Hill are sustainable.	T10a. Investment in capital works for recreation on Munibung Hill will be funded from a variety of sources, including developer contributions, grants and partnerships, over the life of this Management Plan. T10b. Partnership opportunities for funding are investigated and implemented where appropriate to cost effective delivery of public benefit.
	11. Management activities on Munibung Hill, funded by LMCC, provide public benefits, not private benefit.	T11. Increased public use and enhanced biodiversity outcomes on public land are evidence of public benefit.

Sustainability Pillar	Management Objectives	Management Targets
Governance	12. All relevant landholders and stakeholders, including the Aboriginal community are consulted about detailed design and implementation of access improvement projects (see also engagement strategy)	<p>T12a. An ongoing mechanism for engaging the Aboriginal community in the management of Munibung Hill is established by 2025 and continues to function to the satisfaction of Aboriginal community representatives (see also engagement strategy)</p> <p>T12b. Council regularly seeks feedback from residents in streets adjoining Munibung Hill about recreational access benefits and any impacts on local amenity</p> <p>T12c. Council has a constructive relationship with adjoining major landholders so that there is a consistent approach to important natural and social values and management issues that cross land tenure boundaries can be resolved efficiently and effectively.</p>
	13. Tenure arrangements and planning requirements for potential access points are clarified.	T13. An additional District level public access point is agreed with landholders by 2032.
	14. Responsibility for achieving the targets is assigned to a relevant Council team.	T14 and T15. Management of Munibung Hill consistently and transparently complies with approval requirements for works on public land.
	15. Opportunities for Landcare to undertake works are investigated and promoted.	

3.0 Evidence for Management: Context, Values and Issues

3.1 Overview

This section reviews the factors that have influenced strategic direction and management actions in the draft Munibung Hill Management Plan.

Contextual values and issues were identified through:

- literature review, and
- community and stakeholder engagement, including with council and public authority officers, land owners, residents, recreational users, Aboriginal community and others with an interest in the future of Munibung Hill.

A detailed review of the context of Munibung Hill, its values and use, and management constraints is presented in Umwelt (2021a). The information in this section provides an overview and integrates context, values and issues for management.

The information in this section is organised in four broad themes, linked to three of the four Sustainability Pillars in Council's ESSAP 2019:

- Environmental management (**Section 3.2**) – context and values. This includes biodiversity, surface runoff, soils and slope processes, erosion, off site impacts and contamination issues.
- Social context and values (**Section 3.3**). This includes:
 - Current use of the place.
 - Equitable recreational access arrangements to meet projected changes to demand for recreational opportunities in natural areas in the north-west of Lake Macquarie.
 - Existing issues associated with access and safety.
 - Social context also includes culture and heritage context, values and issues (**Section 3.3**). This focuses on Aboriginal cultural values which are recognised as being very high and have implications for management of access to Munibung Hill.
- Governance context (**Section 3.5**). This includes the complex and changing tenure, regulatory and planning context of land around Munibung Hill and the ongoing governance relationships needed for effective management of complex and interacting management issues.

The economic sustainability pillar of the ESSAP is addressed in two ways in the Munibung Hill Management Plan:

- Through the identification of a staged and evidence-based model of development of recreation infrastructure, so that Council invests in the highest priority actions first and confirms feasibility and governance arrangements (including roles, responsibilities and funding) before extending the scope of recreational opportunities.
- Through the use of developer contributions to fund infrastructure that will increase and diversify recreational opportunities for the increasing number of people living around Munibung Hill and in the proposed growth areas to the north-west.

A summary of the most important values of Munibung Hill is in **Section 3.6**, together with a summary of the management issues that arise from the interaction of values and current management. These issues and their significance drive the management themes and actions in **Section 4.0**.

3.2 Environmental Context and Values

3.2.1 Environmental Context and Values

3.2.1.1 Landscape Context

Munibung Hill is a highly prominent feature at the northern end of Lake Macquarie. The elevation of the Management Area varies between approximately 15 metres above sea level to 164 metres at the highest points along the main ridgeline of Munibung Hill. Because of its elevation, Munibung Hill is an important visual landmark and offers extensive views across the City and lower hunter landscape.

The geology and geomorphology of Munibung Hill are important factors in its value but also are associated with several risks, constraints, and important management issues. Munibung Hill is part of the Permian Newcastle Coal Measures, and the geology comprises interbedded sequences of sandstone and conglomerate of the Teralba Conglomerate, overlying siltstone, coal, and tuff. The cliffs on the upper slopes of Munibung Hill are formed in the resistant Munmorah Conglomerate. Historically, fresh water springs were reported on the western slopes, at the interface of sandstone and siltstone geological units.

Soils on Munibung Hill are mapped within the Warners Bay, Stockrington and Cedar Hill Soil Landscapes (Murphy 1993). Former Pasminco and quarry land are mapped as 'disturbed land'. These sites have undergone further extensive disturbance during site remediation processes, including reshaping terrain and replacing soil materials.

The natural soils on Munibung Hill have high erodibility and erosion hazard, for sheet erosion of surface soil and rill erosion or gully of subsoils. Some steep areas also have a mass movement hazard, including rock fall from strongly jointed cliff faces and landslip. The existing tracks on Munibung Hill display extensive erosion, creating deeply rutted and rilled surfaces and slippery gravel lags (gravel from the underlying conglomerate rock) on the track surface. Risks associated with erosion include safety for walkers, impacts on drainage lines, impacts on local recovering vegetation and offsite impacts on water quality.

Cockle Creek, an estuarine tributary of Lake Macquarie, flows to the west of Munibung Hill and enters the lake at a complex delta (five Islands) at the head of Cockle Bay. To the east of Munibung Hill is the catchment of a smaller tributary, South Creek. Runoff from the steep and disturbed west facing slopes of Munibung Hill flows mainly to Cockle Creek or directly to the northern shoreline of Lake Macquarie via several short steep catchments. Both runoff pathways have been severely impacted in the past by contaminated discharges and high sediment yields from severely eroded soils. A healthy lake is a core value of Lake Macquarie City Council and its community. Management of erodible soils to reduce and stabilise hill slope erosion and sediment yield is an important component of site planning and management.

3.2.1.2 Natural Areas and Biodiversity

The upper ridges of Munibung Hill are dominated by a dry forest typical of much of Lake Macquarie with the lower eastern slopes supporting coastal dry forest and ecotonal moister forests in sheltered aspects. The remnant and recovering native vegetation on Munibung Hill provide not only a visual backdrop but importantly provide wildlife corridors and green grid connectivity across the northern part of the City, north to south and east to west.

There is potential through the Management Plan to strengthen these connectivity values, enhance habitat values and protect threatened species known from Munibung Hill including:

- The Lowland Rainforest threatened ecological community.
- The critically endangered Scrub Turpentine.
- The endangered Magenta Lilly Pilly which is in an area that was a previous Landcare site. It is not clear whether this specimen may have been planted in the area.
- Raptors including the sea eagle and osprey have been recorded in the area, but no nests have been identified for either species in the Study Area with the osprey known to nest on the northern shores of Lake Macquarie.
- The Masked Owl and Powerful Owl, with a new family of the powerful owl recently recorded on Munibung Hill.
- The Squirrel Glider which is known to be strongly associated with forests dominated by winter flowering gums and have been recorded in the northern part of Munibung Hill.
- Migratory species including the critically endangered Swift Parrot.
- The Grey-headed Flying-fox which forages over Munibung Hill commuting from nearby camps including those in Newcastle and other parts of Lake Macquarie.
- A number of threatened microbats including the little bent-winged bat and large bent-winged bat which may roost in rock shelters and caves and the eastern coastal free-tailed bat.

While not included in the current Management Area it is important to also recognise the value of the large number of *Angophora inopina* trees protected within a specific reserve to the north of the Management Area. This area is currently managed by WAMC and has been included in the Further Investigation Area (**Figure 1.2**) to recognise the long-term aim of linking this reserve to the current Management Area.

The City-wide Plan of Management for Community Land 2011 categorises the Community Land on Munibung Hill as a natural area. Core objectives for natural areas are identified in the Plan of Management (LMCC 2011):

- To conserve biodiversity and maintain ecosystem function in respect of the land, or the feature or habitat in respect of which the land is categorised as a natural area, and
- To maintain the land, or that feature or habitat, in its natural state and setting, and
- To provide for the restoration and regeneration of the land, and
- To provide for community use of and access to the land in such a manner as will minimise and mitigate any disturbance caused by human intrusion, and
- To assist in and facilitate the implementation of any provisions restricting the use and management of the land that are set out in a recovery plan or threat abatement plan prepared under the *Threatened Species Conservation Act 1995* (LMCC 2016) (this is now provided for by the *Biodiversity Conservation Act 2016*).

Council exhibited draft Natural Areas Management Guidelines in early 2021. These guidelines are intended to provide certainty for developers required to prepare a Vegetation Management Plan as a condition of consent.

The guidelines also specify the information and processes required by Council to adequately achieve, assess and report on rehabilitation, revegetation and management of natural areas including rehabilitation works under Part 5 *Environmental Planning and Assessment Act* (EP&A Act), works by Council and other authorities, rehabilitation of native vegetation on Council land, geotechnical investigation, and change in land management and services through native vegetation on Council land.

The detailed specification in these guidelines reflects the very high value that Council and its community place on the bushland natural areas across the city. Munibung Hill is a large area of regenerating bushland under mixed public and private tenure. Integrated vegetation management across all tenures is an important part of protecting and enhancing the natural area value of Munibung Hill.

3.3 Social Context and Values

3.3.1 Site Use and Context

3.3.1.1 Site History

The land use history of the Management Area can be considered in four phases:

- Land use by Awabakal people. Munibung Hill is an important part of the cultural landscape of the Awabakal people (see **Section 3.4**).
- Early colonial settlement in the mid 19th century, including some clearing for agriculture in the Speers Point and Boolaroo areas and small coal mining ventures.

The northern rail line passed through Cockle Creek in the late 19th century.

- Heavy industrial development. Pasminco operated the Cockle Creek Lead Smelter for more than a century, from 1897. The operations of the smelter and later associated heavy industries (such as

Incitec) influenced adjacent settlement and communities such as Boolaroo and Argenton throughout the twentieth century. Two gravel and rock quarries also operated on Munibung Hill at this time. Although Munibung Hill was impacted by air and soil contamination from ongoing emissions during the twentieth century and much of the natural woodland vegetation was lost, the Hill was also visited by locals for recreation. It is reported (community submission to LMCC's heritage team) that gun emplacements on Munibung Hill were part of the fortification of Lake Macquarie during the Second World War.

Since the closure of the Pasminco lead smelter in 2003, remediation of land contaminated by a century of industrial emissions has enabled rezoning and redevelopment of the lower slopes for residential and employment uses. The State Environmental Planning Policy Amendment (Remediation of Land) 2018 commenced on 31 August 2018, setting standards for urban renewal.

- Urban renewal and urban and commercial expansion are also occurring throughout the north west corridor of Lake Macquarie, including Boolaroo, Argenton, Glendale, Edgeworth, Cameron Park and West Wallsend. The closure of polluting industries, population growth and recovery of vegetation on Munibung Hill have jointly encouraged an increase in recreational use, in an uncontrolled 'natural' open space with wide views of the lake.

3.3.1.2 Current Use Context and Development Processes

As noted above, Munibung Hill is used by local residents for informal, passive recreation, following multiple existing tracks whose origins are in the various historic land uses of the place. These tracks pass through regenerating woodland and diverse terrain, including deep gullies, steep slopes and elevated ridge crests.

Opportunities for walking on Munibung Hill are promoted in local social media, although some of the land on which tracks are located is not public land.

Further information about track condition and access points is in **Section 3.3.2**.

Munibung Hill is surrounded by urban development, including residential, commercial and industrial land. Three of the main road corridors for Lake Macquarie pass to the west, south and east of Munibung Hill, with Munibung Road now connecting the east and west road corridors across the north of the Management Area. The Management Area is centrally placed in the city, making it strategically accessible and it is visible by traffic passing along these main road corridors.

The former PCCS site is currently being developed as a mixed-use urban area for large lot commercial business (such as Costco and Bunnings) and a range of residential developments. Some of this development is completed, while other areas are currently under construction or are subject to planning processes. Council's strategic land use objectives for the land include replacing past employment and accommodating population growth in a highly accessible and well serviced part of the City.

Several lots in the area surrounding Munibung Hill are private residences on large lots. These are predominantly on the east, north-east and south-east of Munibung Hill.

Other lots in the Munibung Hill area are currently subject to development and planning processes for residential development. The portions of the land on the south-western side of Munibung Hill (the previous Hawkins Quarry site), are owned by Munibung Hill Pty Ltd, and are currently being remediated to enable development as a residential subdivision marketed as Munibung Hill Estate. These growing residential estates will contribute to the future growth of northern Lake Macquarie's economy and contribute to an increasing need to create recreational areas to meet the lifestyle needs of the growing community.

Conservation is a continuing land use on Munibung Hill. This includes a reserve area for *Angophora inopina* on WAMC land at the northern end of the Management Area.

Environment protection or management zoning applies across most of the non-urban parts of the site. Some areas are zoned open space.

3.3.2 Track Access and Condition

The long history of development around Munibung and onto its slopes has created multiple tracks. Unsealed vehicle tracks (current or legacy) provide access for maintenance of telecommunications towers and fire management, and formerly provided access for air quality monitoring stations. Some tracks are associated with former quarry sites. Some tracks have been made by local residents visiting Munibung Hill for recreation or more recently for local scale conservation and enjoyment of the natural areas. Many existing tracks are wholly or partly on private land.

Many tracks located on Munibung Hill are steep unsealed gravel paths which have loose surface gravel and often deep rills from erosion. The majority of the existing walking tracks on Munibung Hill meet some requirements of Grade 3 to 4 walking tracks under the Australian Walking Track Grading System (AWTGS), but have sections that are in poor condition, highly eroded or overgrown. Safe passive recreation requires reliable track conditions, consistently meeting at least Grade 4 requirements, and suitable for independent walkers.

While there is pedestrian access from the local residential areas (from small reserves at the end of narrow suburban streets), there is currently very limited parking for people travelling from elsewhere in the City or from the lower Hunter.

Existing tracks which have been identified as possible options to facilitate access to Munibung Hill are outlined in **Table 3.1** and shown in **Figure 2.1**. Although primarily on Council land, parts of these tracks traverse private land.

Table 3.1 Existing Tracks on Munibung Hill (Identified in the Concept Plan)

Reference	Location	Description	Comments
Existing Tracks (shown in Figure 2.1)			
A	North South Ridge trail/track	<p>Vehicular trail (although some sections are not passable by vehicles), and connecting pedestrian track, along the main north south ridge.</p> <p>Between the telecommunication facilities on Munibung Hill and the facility at the southern end of the ridge.</p> <p>This ridge crest track can be reached via the steep path from Lucilla Ridge (track F), Blaxland Road or Ambleside Circuit or Kanangra St (track G) (northern end); from the telecommunications tower vehicle track (south-west) and from the steep tracks Quarry Road track (track E), in the south.</p>	<p>Existing trail is mainly located in WAMC land (Lot 51 DP1229360) and Munibung Hill Pty Limited land (Lot 21 DP790637). Small section is located in Council owned Lot 4 DP818323.</p> <p>Identified in the Glendale Contributions Recreation and Land Plan (LMCC 2016) as a major public access track requiring acquisition or easement.</p>
E	Quarry Road, Speers Point trail/track	<p>Existing sealed vehicular trail and informal car park off 1A Quarry Road. Vehicular trail extends around to the top of the quarry face where it then reverts to a walking track.</p> <p>Council owned land includes 1A Quarry Road (Lot 1 DP335551) and 10A Hopkins Street (Lot 21 DP804331).</p> <p>Part of this track passes through private land, which is zoned for environment protection and is subject to a vegetation management plan.</p>	<p>Pedestrian access around the top of the quarry continues to the main north south ridge trail. Section from the top of the quarry is through Part 1A Raymond Street (Lot 21 DP790637).</p> <p>Identified in the Glendale Contributions Recreation and Land Plan (LMCC 2016) as a major public access track requiring acquisition or easement.</p>
F	Lucilla Ridge pedestrian track	<p>Pedestrian access off Lucilla Ridge to main North South ridge track.</p>	<p>Steep eroded track with multiple tracks formed near the ridge.</p> <p>Council owned land 25C Lucilla Ridge (Lot 330 DP1162784) then 65A Lawson Road (Lot 31 DP879071 –operational land).</p> <p>Identified in the Glendale Contributions Recreation and land Plan (LMCC 2016).</p>
G	East West corridor track	<p>Pedestrian access from either Blaxland Road or Ambleside Circuit to main North South ridge track.</p>	<p>Multiple track formations. Including some from private residences.</p> <p>Tracks off Blaxland Road are located in 171 Macquarie Road, Warners Bay (Lot 672 DP805546).</p> <p>Tracks off Ambleside Circuit are located in 179 Macquarie Road (Lot 5410 DP807486).</p> <p>Access to this track is also provided off Kanangra Street, Grasmere Way and Yurunga Steet Warners Bay.</p> <p>Identified in the Glendale Contributions Recreation and land Plan (LMCC 2016).</p>

3.3.3 Community Values

Surveys conducted as part of this project (see Umwelt 2021d) provide evidence that Munibung Hill's natural landscape and recreational opportunities are highly valued by the local community. Important components of community value include:

- Relatively untouched natural environment. Members of the community expressed a high regard for the opportunity to traverse a natural area and connect to nature so close to the City and its amenities.
- Scenic views over Lake Macquarie and surrounding districts. One of the most important values associated with the distinctive morphology of Munibung Hill is linked to visibility and views. The elevation of the ridge crest and its position at the head of the lake mean that Munibung is a key element of the visual context of the City. Munibung Hill is visible from most of the northern part of the lake and from suburbs spread to the east, south, west and north. The ridge crest affords extensive views south down the lake, west to Mount Sugarloaf, east across Charlestown to the sea and north towards Newcastle, Hexham Wetland and the Hunter estuary and beyond to Stockton Beach and dunes.

It is important to note that the visual and visibility values have applied to the Hill for thousands of years. The ridge crest of Munibung Hill provides views across nearly all of traditional Awabakal country (see **Section 3.4**). It was a landmark for early European settlers in the district. It continues to be a landmark, central to the northern part of the City and also the City of Newcastle.

The survey results (Umwelt 2021d) also indicate that the local community supports the future potential of Munibung Hill for passive recreation and for conservation.

3.4 Cultural Context, Values and Issues

3.4.1 Aboriginal Cultural Values

A review of the Aboriginal cultural heritage values of Munibung Hill is included in Section 8.0 of Umwelt 2021a.

Munibung Hill is within the Country of the Awabakal people. Aboriginal people have lived in the local area for tens of thousands of years. It provided features and resources such as rock shelters, food plants and animals, materials for implements (both stone and plant based), a source of ochre, fresh water (at several small springs on the lower slopes), as well as having significant cultural values.

Eight Aboriginal archaeological sites have been described in the Munibung Hill Management Area, including artefact scatters/isolated artefacts, a rock shelter and a grinding depression.

Much of the information that is currently understood in the wider community about the Awabakal people in the Lake Macquarie area comes from the writings of Reverend Lancelot Threlkeld, who initially established a mission at Belmont in 1825-6. Threlkeld, with assistance from Biraban and other Awabakal elders, recorded Awabakal language, stories and connections with key landforms, including Munibung.

Threlkeld (in Gunson 1976:64) references the presence of:

Ko-na-ko-na-ba, the name of a place where the stone called Ko-na-ko-na is found. There are veins in the stone, which contain a yellow substance used for paint in warlike expeditions. The name of a large mountain, the north extremity of Lake Macquarie.

This is generally accepted to be a reference to what is now known as Munibung Hill. Further, Threlkeld (in Gunson 1976:65) describes the importance that Aboriginal people in New South Wales placed on elevated areas noting that

on a high hill, or rather a range of hills, was a circular erection of stones, of about 5 or 6 feet in diameter, and two or three feet high, evidently built, but not cemented with anything.....On enquiry of my Black tutor, M’Gill, he informed me that the tradition was, that the Eagle-Hawks bought these stones and placed them together in the form in which they were found.

A stone arrangement was recorded on Munibung Hill in the 1990s, based on this reference.

3.4.1.1 Existing Protection of Cultural Values

Site investigation and engagement with the local Aboriginal community has found that the highly valued cultural significance of Munibung Hill is intangible but the value exists ‘whether or not any archaeological evidence of past activities is retained’ (Umwelt 2004). Cultural values of Munibung Hill relate to key cultural beliefs.

The majority of Munibung Hill is mapped as a Sensitive Aboriginal Cultural Landscape in the Lake Macquarie LEP 2014. The LEP requires that development applications for projects in Sensitive Aboriginal Cultural Landscapes are supported by studies and consultation with Aboriginal stakeholders

During the development of the Management Plan, consultation with the Aboriginal community included an on-site meeting to discuss cultural values and concerns, and an opportunity to review the concept plan for the Management Area.

During the on-site meeting, representatives of Biraban Local Aboriginal Land Council and Awabakal Descendants Traditional Owners Aboriginal Corporation indicated that the future use of Munibung Hill should be limited to activities that do not result in substantial impacts to the landscape, such as walking in areas where clearance for tracks has already occurred. Any need for track improvement would require consideration of potential impacts to Aboriginal objects and should be done in a manner than minimises the overall footprint.

In general terms, the Aboriginal community representatives support bush regeneration activities such as erosion control, weed management and native planting. Passive recreation on existing tracks and potentially a scenic lookout would be viewed favourably, subject to detailed design and protection of archaeological sites.

Activities such as recreational 4WD and motorbike use are not considered suitable within the area while cycling should be limited to the existing developed areas, with potential for some mountain bike access using only the highly eroded tracks along the ridge north west from the communications towers. This north-west ridge is outside the Management Area for the next 10 years but may be considered to recreational use in the future. Avoidance of all areas containing rock overhangs should be observed as these areas have the potential to contain cultural material.

In the future, Munibung Hill could provide an opportunity to raise awareness of the Awabakal cultural landscape of Lake Macquarie. Any proposal for interpretation should be discussed with the Awabakal people and community representatives should be involved in the preparation of any materials.

The Munibung Hill Conservation Society lodged an Aboriginal Place nomination with the NSW Heritage Office in 2020. The nomination was supported by some Aboriginal groups in the community and is broadly

consistent with a recommendation of the Lake Macquarie Aboriginal Heritage Management Strategy (2011). The nomination is being reviewed by the NSW Heritage Office. If the Heritage Office determines that Munibung Hill should be gazetted as an Aboriginal Place, a management plan to protect the cultural values of the Place will be required (consistent with guidelines prepared by NPWS) and must be prepared in close collaboration with Aboriginal community representatives, including traditional owners and elders.

3.5 Governance Context and Issues

3.5.1 Planning Context

Legislation and enabling plans and policies provide the statutory framework for future land uses, development, and management of the Munibung Hill precinct. A summary of the State and local legislation and planning policies relevant to the Munibung Hill area is provided in **Appendix C**. Further information is in Section 3.0 of Umwelt 2021a.

Munibung Hill is a strategic natural and open space asset for LMCC. The Management Plan fits into Council's hierarchy of city-wide strategic plans and local area management plans.

Council's management plans respond to State and regional policies and planning strategies, which provide strategic context (refer to **Figure 3.1**).

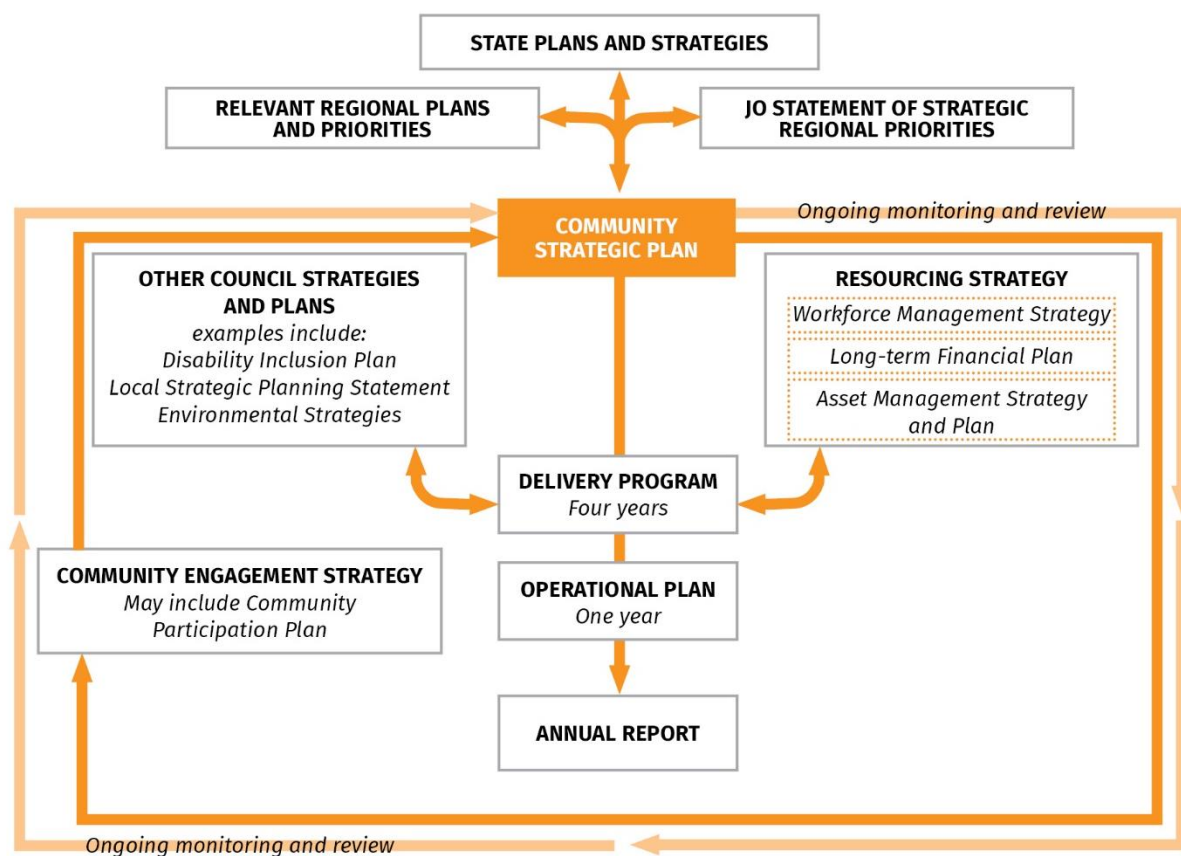


Figure 3.1 Integrated Planning and Reporting Framework (LMCC 2020)

The Munibung Hill Management Plan is a strategic plan for Council and is linked to several of Council's key Strategic Plans, including:

- Parks and Play Strategy
- Environmental Sustainability Strategy and Action Plan
- Destination Management Plan
- Heritage Plan.

There is also a strategic connection from the Munibung Hill Management Plan, through Council's Precinct Plan for the Pasmenco/Munibung Hill area, the Glendale Developer Contributions Plan for the North West Growth Area and the Local Strategic Planning Statement which identifies where growth in recreational demand will be strongest.

3.5.2 Land Ownership and Use

The diverse land ownership across Munibung Hill adds a level of complexity to any initiative that will cross multiple owners' land. Complex land ownership can constrain use as compliance with different planning and assessment requirements that apply to different land types will add further complexity.

Some tracks and access points traverse private land. Multiple landholders are involved with the planning and approval process as mentioned in **Section 1.3**. Future management directions will be constrained by the cooperation of these landholders. Access points currently on private land do not provide inclusive access. Information gathered from community engagement states that the current track and access situations often deters possible visitors as they are either unaware the tracks exist or unclear where access is legal. Agreements such as leases or easements will be required to address the constraint of land ownership on the future use of Munibung Hill.

The Management Plan focuses on land that is owned by Council for proposed access points. However, the track from the Quarry Road access point crosses land owned by Munibung Hill Pty Limited.

3.6 Summary Values and Management Issues

Table 3.2 summarises the most important values of Munibung Hill.

Table 3.2 Munibung Hill Key Values

Key Value	Description
Natural Landscape	Munibung Hill provides an important natural landscape for native flora and fauna play a vital role for the conservation of threatened species. Munibung Hill provides a unique opportunity to experience a pocket of 'natural' land with picturesque views of Lake Macquarie and surrounds.
Lifestyle and Recreation	Munibung Hill's high scenic and natural values provides a unique recreational opportunity for the Lake Macquarie community and beyond. Community access to green open spaces close to residential areas is an important aspect for a healthy lifestyle and Munibung Hill aims to create an accessible space for all of the community.
Community and Culture	Munibung Hill area has extremely high Aboriginal cultural value. Munibung Hill represents a unique opportunity to educate members of the community of the cultural significance of the area while they enjoy the experience and create a connected community.

3.6.1 Constraints and management issues

The values identified in **Sections 3.1 to 3.5** also highlight issues that need to be managed so that enhanced recreational access is balanced with robust environmental protection and appropriate risk management. This is consistent with the guidance provided by Council's ESSAP which promotes a sustainable balance between environmental, social and economic elements.

Table 3.3 provides an overview of the management constraints and issues for integrated conservation and recreation uses on Munibung Hill.

Together with values and opportunities, these issues and constraints drive the actions in the Management Plan.

Strategies and actions to address the management issues are discussed in **Section 4.0**.

Table 3.3 Summary of Constraints Affecting Decisions about Potential Conservation, Recreation and Tourism Uses

Sustainability Pillar	Hazard/Risk/Constraint	Level of Constraint	Potential Land Use Exclusions	Manageable with Good Design and Controls
Environment	<p>Rock falls from cliffs or conglomerate outcrop.</p> <p>Consider both rocks falling from cliffs and people falling from unprotected loose edges.</p>	High (but needs further investigation); site specific – conglomerate cliffs.	Some outcrops are associated with rock shelters and access would likely be excluded because of cultural value.	<p>Potential for rock fall at former Council quarry (Quarry Road) needs detailed investigation as this location could provide parking and 'trail head' facilities for several recreational, educational and tourism uses.</p> <p>May be manageable with rock bolts and rock fences, depending on detailed investigations.</p>
Environment	<p>Topography, including steep slopes.</p> <p>Limitation on access for some groups of people.</p>	High , falls risk, uneven and steep grades limiting access by pedestrians and vehicles.	<p>There is currently no access to Munibung Hill for people with limited mobility.</p> <p>Current tracks are generally not suitable for bicycle access around the hill, significant upgrades would be required to make this safe and reduce erosion risks.</p> <p>Upgrades to enable and support bike riding are not proposed in the current Management Plan. Neither of the proposed access routes from district level trail heads is suitable for bikes without major works, including clearing wider corridors to create tracks at a passable gradient. Such works would increase environmental impacts and the potential for conflicts between users.</p>	<p>Raised walkways, stairs and hard surface tracks.</p> <p>Investment in track and trail construction to make safe and stable for pedestrians.</p> <p>Separation of pedestrians from vehicles (where vehicle access is required for maintenance of services or tracks or fire management).</p>

Sustainability Pillar	Hazard/Risk/Constraint	Level of Constraint	Potential Land Use Exclusions	Manageable with Good Design and Controls
Environment	Erosion of tracks and adjacent areas.	<p>High; erosion hazard and existing severe sheet and rill erosion on tracks and steep side slopes contribute to the high sediment yield from Munibung Hill to the northern part of Like Macquarie; also affect low order drainage line stability.</p> <p>Many of the steeper valleys contain drainage lines and intermittent watercourses that may be subject to local short term or flash flooding.</p> <p>Erosion is damaging to cultural heritage.</p>	Does not exclude pedestrian use of existing tracks. Does require control of access by vehicles and trail bikes which damage track surfaces.	<p>Can be managed (and will be a benefit of more formalised management), by erosion controls and improved cross drainage, rehabilitation of disturbed areas and more formal track construction to meet Grade 3 (or 4) Australian Track Standards.</p> <p>Disturbance of natural watercourses including vegetated riparian zones and habitat should be avoided. Eroded banks and bed need to be stabilised to protect biodiversity values and to reduce risks associated with flooding and sedimentation downstream.</p>
Environment	Contamination of soils with heavy metals.	<p>High, noting that the primary source of contamination has been removed and details on the level of contamination of council land and the upslope parts of HCCDC land has not been confirmed in detailed studies.</p>	The Concept Plan and Munibung Hill Management Plan focus on passive, pedestrian-based recreation, so that risks can be managed.	<p>Generally manageable with controls that keep users on the tracks and with track surfaces either built up with clean material, or on boardwalk, or paved.</p> <p>Construction of new tracks away from existing routes would also require detailed testing and management to separate users from contaminated soil. New track construction is not supported by Aboriginal community stakeholders. Remediation of areas will require vegetation and potentially soil management that will create attendant biodiversity, erosion and scenic impacts.</p>

Sustainability Pillar	Hazard/Risk/Constraint	Level of Constraint	Potential Land Use Exclusions	Manageable with Good Design and Controls
Environment	Contamination of surface runoff with heavy metals.	High , as an offsite impact, but lower risk to people visiting Munibung Hill.	The potential for contamination in runoff is a further reason to control soil erosion, as contaminants are attached to soil particles, or soluble in water or transported by water.	Can be managed as part of the soil erosion and runoff controls, enhancing the environment on Munibung Hill and reducing sediment load to the northern part of Lake Macquarie.
Environment	Presence of threatened species and threatened ecological communities.	Very High , but localised.	<p>Effective protection is likely to require exclusion of active uses from the threatened ecological communities and strengthened protection for scrub turpentine (listed as critically endangered under EPBC Act). Protection of scrub turpentine may require exclusion of use from some areas.</p> <p>May require seasonal exclusions around nest sites for threatened species such as the Powerful Owl or White-bellied Sea eagle.</p> <p>Microbats are likely to use cave sites which are also of high cultural heritage value and would be excluded from use unless the Aboriginal community agrees to allow access to selected sites.</p>	<p>Generally manageable within the overall plan for access and use, with detailed management controls as required.</p> <p>Clearing of the EEC and threatened species are to be avoided (and would be subject to a complex approval process); this includes any clearing to widen existing tracks that would impact on these species/communities.</p> <p>Educate users and manage access to caves with consideration of both micro bat and Aboriginal cultural values and requirements.</p> <p>Potential to strengthen ecological connectivity to the north-west and north-east through regeneration.</p>
Environment	Scenic value of vegetated ridgelines to the north of Lake Macquarie waterway	Moderate ; Munibung Hill is a visual landmark from the waterway and also from surrounding major road corridors and suburbs. This is due to both elevation and vegetation.	<p>Does not preclude pedestrian use of existing tracks.</p> <p>Conservation management will support the visual amenity value.</p>	Visual constraint can be managed with design and management, noting the need to balance views for recreational users on the hill (a key community value), with views from surrounding areas (also a community value).

Sustainability Pillar	Hazard/Risk/Constraint	Level of Constraint	Potential Land Use Exclusions	Manageable with Good Design and Controls
Environment	Bushfire hazards and risks within the Management Area and for surrounding areas.	High; Fire frequency and intensity affect recovery of endangered ecological communities and threatened species habitat. Steep slopes, existing erosion zones and overgrown or fenced off access points do not provide effective access for emergency vehicles for fire control.	Does not exclude pedestrian access for passive recreation on the designated tracks.	Requires detail design of pedestrian access tracks and service trails to manage both types of access safety and keep other vehicles out – as they are an additional ignition source. Consult adjoining landholders to manage fire risks in a coordinated way.
Social and cultural	Impact of recreational or tourism use on the Aboriginal cultural value of the ridge crest (existing tracks).	High; the values are cultural values rather than archaeological values.	Would not preclude pedestrian use (passive recreation) of existing track routes; may preclude new or more intensive uses.	Access along the main ridge and spur tracks can be managed with good consultation, design and management.
Social and cultural	Impact of track reconstruction on archaeological or cultural values.	High; An AHIP would be required for works in some locations; Aboriginal Heritage Impact Permit (AHIP) process will become more complex if the land becomes listed as an Aboriginal Place, subject to an AP management plan.	Should not preclude reconstruction on the same alignment, but detailed consultation will be required.	Detailed engagement will be required about track widening and any alternative routes; and alternative track design, particularly if excavation is required near known sites. The entire ridge crest is mapped as culturally sensitive.
Social and cultural	Impact of extending recreational use away from existing tracks and trails (as identified in the Concept Plan).	High; both cultural and archaeological significance to be considered.	Aboriginal community consultation to date indicates this would be opposed. Detailed consultation will be required for any proposed new tracks or other infrastructure/use beyond walking.	Detailed consultation will be required to confirm appropriate access areas and interpretation of heritage values. AHIP likely to be required in some locations. This will be undertaken in consultation with Aboriginal knowledge holders.
Social and cultural	Impact of intensification or diversification of recreational and tourism uses – on and off the existing tracks and trails.	High; related to cultural values of the area.	Consultation with the Aboriginal community to date indicates this extended development would be opposed.	Detailed consultation with the Aboriginal community will be required for any new uses or disturbance.

Sustainability Pillar	Hazard/Risk/Constraint	Level of Constraint	Potential Land Use Exclusions	Manageable with Good Design and Controls
Social and cultural	Site access and connectivity – parking and trail head land.	<p>Very High; access points used for current low-key recreation are generally not suitable for access by a large number of users – steep, limited parking and limited opportunity to facilities such as interpretation and no amenities. No current access option is suitable for a regional scale facility.</p> <p>Connectivity to bike routes is improving, but current tracks are not suitable for bicycle access onto Munibung Hill. Council does not propose to enable mountain bike access on Munibung Hill in this Management Plan.</p> <p>Currently no access for people with a disability.</p>	<p>Unlikely to preclude recreational uses (on its own). Connectivity issues will affect the layout of recreation and how the site is connected to surrounding areas.</p> <p>Layout constraints may affect the value that the community can obtain from the site and potentially create conflicts with uses in surrounding areas.</p>	<p>Management actions will include track alignments and track grading to clearly identify routes suitable for users of different ability/mobility, services, parking and network connections.</p>

Sustainability Pillar	Hazard/Risk/Constraint	Level of Constraint	Potential Land Use Exclusions	Manageable with Good Design and Controls
Governance	<p>Complex land tenure and presence of private land at key locations that are needed to support public benefit.</p> <p>Separate to land tenure, potential governance changes (including engagement, decision-making and approval processes) are required if Munibung Hill is gazetted as an Aboriginal Place.</p>	<p>Very High; Currently many users access the Munibung Hill Management Area through private land, or through land under lease for infrastructure (such as the telecommunications towers in two prominent locations on the ridge crest.</p> <p>The two access points identified in the Management Area are on Council land, but the tracks from Quarry Road pass through private land before reaching the Council land on the ridge crest. Some clearing of vegetation will be required to make these trail head sites functional.</p> <p>Potential options for access in the future require negotiation with local private landholders and HCCDC/WAMC. Although there are several options for local scale access, there are very few options which could provide parking and trail head works suitable for a regional level recreation site.</p>	<p>While access may not preclude uses it is a critical constraint to the scale of use.</p>	<p>All access options have some constraints which limit their capacity to service a regional scale recreation facility. The options which have space (e.g. Blaxland Rd and Quarry Road, will require assessment of impacts on biodiversity, and consultation with local communities about increased vehicle traffic on suburban streets, and the potential for vandalism.</p>

Based on the analysis in **Table 3.3**, the management issues which present a high level of constraint, which can be managed with careful planning, engagement, implementation processes and monitoring are summarised below. The management actions in **Section 5.0** are intended to ensure that these controls are implemented in an orderly way, to protect important values and enable safe passive recreational use and enjoyment by the community.

High level constraints which cannot be feasibly managed over the life of the Management Plan mean that some uses or areas are excluded from this Management Plan. This includes mountain biking and access to the steep and elevated parts of Munibung Hill for people with constrained mobility.

As discussed in **Section 1.5.4**, these uses may become feasible when further investigations and negotiations between council and other landholders have been undertaken, so that risks and effective management measures are clear.

Key constraints and management issues that are addressed in the Munibung Hill Management Plan are:

- Uncertainty about contamination extent and the level of constraint or management required to ensure user safety – on Council land and on WAMC land.
- Track surface erosion and safety. All tracks providing access to the elevated ridgeline of Munibung Hill are steep, and steep sections are severely eroded, with deep rills and sheet wash features. Erosion has both on site (safety and environment) and off-site (environment) impacts. Safety of people walking close to potentially unstable cliff edges is also an important issue.
- Access uncertainty where private land must be crossed to reach the high value recreational locations (e.g. when approaching from Quarry Road).
- Sensitivity of Aboriginal cultural values and maintaining respect and protection while increasing overall visitation to Munibung Hill.
- User and local resident expectations – balancing access, amenity, privacy and environmental protection.
- User expectations beyond passive recreation (walking and associated activities). Concerns about exclusion of mountain bike riders, trail bikes, off road vehicles and people with restricted mobility over the life of this Management Plan will need to be addressed. There are clear land capability and safety reasons for these exclusions. Some of these uses may become feasible in specific locations when constraints such as contamination have been clarified.

These high-level but manageable constraints are addressed by the scheduling of management actions in **Section 5.0**.

4.0 Management Strategies and Actions

This section establishes the management strategies and actions to be implemented to deliver the Concept Plan for the Munibung Hill Management Area over the next ten years.

It identifies the strategies to address the identified issues and risks within the four pillars of sustainability (from Council's Environmental Sustainability Strategy and Action Plan 2020)

The Concept Plan is outlined in **Section 2.4**.

Figure 4.1 shows how the strategies and actions for management of Munibung Hill support the vision, principles and objectives for the Management Area.

Implementation action plans for each of the strategies are in **Section 5**.



Figure 4.1 Strategies and Actions for Sustainable Recreation Opportunities on Munibung Hill

4.1 Strategies for Sustainable Environmental Management

Policy

We will use resources wisely and help to enhance the quality of our natural landscapes. When making decisions we will seek to achieve positive outcomes for our local environment and make an equitable contribution to improving regional, national and global environments.

4.1.1 Biodiversity

Biodiversity Strategy

Use active and passive vegetation management to improve vegetation condition, habitat diversity and canopy cover, with a focus on endangered ecological communities and habitat for threatened species

Management Objective

The condition and connectivity of ecological communities on Munibung Hill is improved.

Management Targets

The area impacted by priority weed species (Weeds of National Significance) decreases in the more significant ecological communities.

The area of canopy cover increases by 2032, providing improvement in vegetation linkages across Munibung Hill.

Note: These targets will be refined when the Vegetation Management Plan for Council land on Munibung Hill has been prepared and more information is available about baseline condition and feasible improvements, aligned with council's broader urban tree canopy targets.

Biodiversity management will focus on four key risks: fire, invasive species, illegal vehicle use on tracks and trails, and legacy contamination. The Implementation Action Plan includes actions to reduce each of these risks, to enhance the protection and recovery of healthy ecological communities on Munibung Hill.

Management will align with the actions set out in LMCC Planning Priority 6 of the Local Strategic Planning Statement (LMCC, 2019), particularly:

- Action 6.5: Prepare, review, and implement guidelines (and associated planning controls) to ensure that biodiversity, and ecological connectivity is adequately assessed, and impacts avoided and/or mitigated within the context of new legislation.
- Rehabilitating wildlife corridors identified in the Lake Macquarie Native Vegetation and Corridors Map 2019.
- Actions within the Munibung Hill biodiversity strategy include the following. Implementation details are in **Table 5.1**.
- Limiting passive recreational activity to existing trails and trailhead/access locations as shown in **Figure 2.1**. Close access to other tracks on Council land (see also **Section 4.2.2**).
- Prepare a Vegetation Management Plan for the Management Area, noting that a Vegetation Management Plan has already been prepared for land owned by Munibung Hill Pty Limited. The Vegetation Management Plan will identify priority bush restoration sites.

- Conduct weed management and bush regeneration programs in accordance with the Vegetation Management Plan, using council, landholder, and community resources (including a Landcare model).
- Minimising the extent of any additional disturbance and vegetation clearance that is required to upgrade and/or formalise the existing tracks and access locations.
- Conduct a baseline survey of invasive plant species on Council land. Repeat at 5 yearly intervals. Priorities for invasive species to be targeted will align with the priorities and responses in regional weed management and biosecurity plans or those species most impacting on the threatened species/communities.
- Conduct a weed control program at trail head sites to reduce the risk of weed spread with walkers moving from these areas onto Munibung Hill. This applies particularly to the Quarry Road site.
- Protecting sensitive areas from unplanned bushfire and protection for threatened species habitat and endangered ecological communities in the fire management plan for the site (see **Section 4.1.3**)
- Install interpretative signage to promote the biodiversity conservation values of Munibung Hill.
- Conduct targeted planting to stabilise eroded surfaces (see also **Section 4.1.2**), improve ground cover and increase canopy cover in woodland communities, especially on ridgelines.
- Engage with private and holders who have property boundaries with Council land (principally residential properties in Speers Point to better manage weed species escaping from private property onto Council land.
- Engage with private landholders and WAMC to coordinate works requiring ground disturbance and to coordinate implementation of vegetation management plans across land tenures.
- Monitor the condition of high ecological value assets such as threatened plant and animal species and endangered ecological communities. Condition monitoring will include baseline and ongoing surveys of invasive species. Monitor the extent of canopy cover on ridges and slopes. Databases for threatened species will be regularly updated with all available information. This information includes threatened species identified through reports and by Council staff and will be recorded through Council's Natural Resource Atlas and reported to DPIE for inclusion on the National Parks and Wildlife Atlas.

4.1.2 Erosion and Slope Stability

Erosion and Slope Stability Strategy	
Control erosion and slope stability risks on and near designated walking tracks to improve safety and reduce off site sediment load.	
Management Objective On and off-site impacts of erosion on Munibung Hill are reduced.	Targets Severely eroded track surfaces on designated tracks is stabilised. An assessment and prioritisation process for erosion control on tracks is completed within 2 years. All tracks designated in the Concept Plan have stable surfaces by 2032. Sediment load in runoff from Munibung Hill to Lake Macquarie is reduced.

As discussed in **Section 3.3.2**, ground surface stability includes erosion hazards and the potential for rock falls from conglomerate cliffs on the upper slopes of Munibung Hill.

Eroding track surfaces contribute to:

- Poor walker amenity and safety, with slippery, uneven (deeply rilled) surfaces.
- High sediment yield from Munibung Hill, contributing to high sediment loads into northern Lake Macquarie. This is exacerbated where eroding tracks cross creek lines and where creek lines are also gullied. The steep slopes of Munibung Hill mean that sediment transport is rapid in heavy rain events.
- Potential mobilisation of contaminants in shallow soils.
- Loss of soil or excess sediment deposition on recovering vegetation, impeding ecological restoration.
- Damage to cultural values.

The proposed designated walking tracks are set back from cliff lines. However, access at Quarry Road may increase visitation to the former Speers Point Quarry floor and walkers may leave the designated tracks to gain better views closer to the cliff edge. There are also east facing cliff faces within 30 metres of the main north south ridge crest track.

The Implementation Action Plan includes actions to:

- Map, assess and prioritise erosion areas on designated walking tracks.
- Develop measures to stabilise and remediate eroded areas to improve user safety and reduce sediment loss. This may include some rerouting (where feasible), measures to control runoff and drainage on steep tracks, measures to stabilise creek crossings, installation of suitable tracks surfaces and revegetation of stabilised areas.
- Identify and obtain necessary planning approvals for track works.
- Prepare studies of cliff stability, rock fall risks and fall risks for pedestrians.
- Develop track design features to manage risks. These include track routing, formalised look out points with safe structures (e.g. as has been done in the Green Point Reserve), use of dense vegetation plantings, fencing and signage.

4.1.3 Contamination

Soil Contamination Strategy	
Clarify risks and manage unacceptable risks to recreational use associated with contaminated land	
Objectives	Targets
Contamination risks for recreational use of Munibung Hill are clarified, and safe recreational opportunities are confirmed	Contamination risks on designated tracks (identified in the Concept Plan) are confirmed to be at safe levels by 2023. The contamination status and recreational potential of land managed by WAMC (outside the Concept Plan and Management Area, but in the Investigation Area) is confirmed by 2027.

Parts of Munibung Hill are affected by uncertainty about contamination risks. Although detailed studies have been completed on contamination on the former Pasminco and Incitec sites, nature and extent of contamination on the upper slopes and ridge crest, is not known.

The potential for heavy metals (including arsenic, lead, zinc, and cadmium) to be present within surface soils presents a risk to human health and the environment.

As outlined in Table 3.6, actions to clarify contamination risks are important for safe use in the short and long term. They provide essential information to identify necessary controls for use of the walking tracks designated in the Concept Plan; and the feasibility of recreational access to investigation areas.

Measures to clarify and manage contamination risks will include (see **Table 5.1**):

- Consultation with WAMC, an appropriately qualified contaminated land consultant and an EPA accredited Site Auditor about the design of a sampling program to clarify contamination levels and depths on and adjacent to the designated walking tracks from the Concept Plan. Conducting this sampling program is an essential early task and results will inform decisions such as detailed track design (including alignment and structures), precautions to be taken during track works and surface treatments.
- Consult with WAMC, an appropriately qualified contaminated land consultant and an EPA accredited Site auditor about developing a sampling program for contamination levels across the land now managed by WAMC (western and north-western slopes). This area is currently identified for investigation and its contamination status has not been tested in detail. The contamination assessment could be conducted in parallel with assessment of ground surface condition, as parts of the WAMC land have extensive erosion (sheet erosion and rilling). This is essential information for future decisions about the feasibility of extending recreational access and introducing additional recreational uses such as mountain bike riding.
- Develop a long-term environmental management plan that addresses residual contamination on the site and any controls required for the use of the walking tracks designated in the Concept Plan. A long-term environmental management plan to support recreational access to the WAMC land would only be developed if testing indicates that it is feasible to provide safe walking and cycling in this area (i.e. risks are negligible or are low and can be managed with management of the ground surface and track design).

4.1.4 Fire Management

Fire Management Strategy	
Manage bushfire hazards and risks across land tenures on Munibung Hill in a coordinated manner, consistent with the Central Coast Bush Fire Risk Management Plan (BFRMP).	
Management Objective	Targets
Threatened and endangered species and ecological communities are protected from inappropriate fire regimes and support the recovery of biodiversity values.	Accessing and responding to unplanned fires on Munibung Hill is made easier, resulting in a declining area impacted by unplanned fires.
Mitigate the contribution of Munibung Hill to fire risks in surrounding urban areas and mitigate risks from fire for people participating in recreation on Munibung Hill.	

Munibung Hill is a ‘natural’ area of grassland and woodland, on an elevated site that is surrounded by urban development – commercial, industrial and residential. The natural areas of Munibung Hill are in several land tenures. Management of fire risks on Munibung Hill requires a consistent and coordinated approach to hazard management and communication, consistent with regional fire management priorities and protocols.

Management actions, roles and responsibilities to reduce bushfire risks are outlined in **Table 5.1**. Key elements of the management approach are noted below.

- Manage fire hazards on Council land on Munibung Hill in accordance with LMCC roles and responsibilities set out in the central Coast Bushfire Risk Management Plan (BFRMP). This includes
 - Maintaining service trail access for emergency vehicles (see also **Section 4.2.3**).
 - Coordinating with NSW Fire and Rescue and adjoining land-owners to prepare a coordinated works program that delivers consistent outcomes across various land tenures on Munibung Hill.
 - Engaging the Aboriginal community in hazard management, including the potential for use of cultural burning techniques.
 - Hazard reduction and other fire management protects threatened species and endangered ecological communities on Munibung Hill.
 - Manage hazard reduction activities to protect recovering vegetation and control (not encourage) invasive plant species.
 - Providing appropriate fire egress routes and signage for recreational users on Munibung Hill if unplanned fire events occur.

4.2 Social and Cultural Sustainability

Policy

We will help build an inclusive, resilient and connected community that embraces innovation and creativity and values our heritage. When making decisions and actions that affect the broad community, we will undertake inclusive community engagement.

4.2.1 Culture and Heritage

Aboriginal Cultural Heritage Strategy

Engage Aboriginal community representatives in detailed track design, planning, implementation, and interpretation to protect cultural values and places.

Management Objective

Aboriginal cultural values are respected and protected.

Targets

The Aboriginal community is involved in the design and management of access to protect culturally important places and is satisfied that recreational use is not compromising cultural values. This would be measured using information from consultation with Aboriginal community stakeholders.

Section 3.4 highlights the cultural significance of Munibung Hill and the level and locations of use that the Aboriginal community believe is compatible with that value.

To ensure that management of recreational access and use on Munibung Hill respects cultural values, the Action Implementation Tables include:

- Consultation with Aboriginal community representatives about how they would like to be involved as the Management Plan is delivered.
- Development of an ongoing governance and engagement framework for Aboriginal culture. It is envisaged that this will include consultation:
 - In relation to the potential disturbance of Aboriginal objects, which are protected under the NPW Act. There are statutory requirements for consultation about cultural values when an Aboriginal Heritage Impact Permit (AHIP) is required.
 - About the potential for dual naming of the place.
 - About detailed design and track alignment, including works to control erosion, construction of steps and ramps and other ground disturbing works.
 - About trail head facilities, including parking and signage.
 - About fire management, including the potential for cultural burning practices, and protection of cultural sites and places if works are required on access tracks or service trails.
 - About interpretation – knowledge to be shared, or not and appropriate locations for signage and other methods including digital information sharing.
 - Whether any on ground works would be done by Aboriginal contractors or works teams.
 - Potential future use of investigation areas, subject to the results of contamination studies.
 - Ongoing reporting about levels of protection of Aboriginal cultural values.
- Consultation with the NSW Heritage Office about their assessment of the Aboriginal Place nomination and implications for Council as a key landholder and manager on Munibung Hill. If an Aboriginal Place is gazetted, a Management Plan to protect the values for which it was gazetted must be prepared. The Aboriginal Place Management Plan and the Munibung Hill Management Plan need to be closely aligned in terms of permitted uses, potential protection precincts, and approval requirements. Note that an AHIP is required for most works in an Aboriginal Place, unless specifically excluded in agreement with the Aboriginal community and NSW Heritage Office.

4.2.2 Access and Track Management

Access and Track Management Strategy	
Develop track head facilities at two locations and upgrade designated existing tracks to provide safe passive recreation access on Council land while protecting natural environment values on Munibung Hill.	
Management Objectives	Targets
Identified walking tracks are safe and stable. The number of recreational users using designated tracks increases.	Identified walking tracks meet Australian standards for Grade 3 or 4 tracks by 2032. By 2032, there is a 20% increase in the number of people walking on the designated tracks on Munibung Hill. Note: The Action Implementation Plan includes actions to better document the use of Munibung Hill.

There is a local community (i.e. the suburbs surrounding Munibung Hill) expectation that access to Munibung Hill for passive recreation is part of the lifestyle of the locality. Access onto Munibung Hill is currently uncontrolled. Local visitors include runners, dog walkers, trail, and mountain bike riders, 4WD vehicles (western slopes), and families.

The number of people visiting the site is limited by:

- Lack of broad community knowledge about access.
- Lack of clarity about legal access points and tracks.
- Lack of knowledge about track routes and where views are available.
- Lack of trail head facilities, particularly parking, but also other facilities such as toilets, signage, and picnic areas
- The poor condition of tracks. Steep tracks with eroding surfaces and loose gravel are a safety and capability issue for families with young children and for people with any fitness or ability limitations. Some tracks have deep rills, gutters or eroded holes.
- Some tracks are overgrown with dense vegetation (weeds).
- Concern about contamination.

To meet community expectations, clearly define access points and improve the condition of tracks, the Management Plan includes the following actions with details provided in **Table 5.2**:

- Arrange a full survey of the boundaries of Council owned and managed land on Munibung Hill (see also **Section 4.1.4** re land tenure aspects of governance). Council needs to be certain about whether the existing track alignments are on its land or adjoining land parcels, so that any necessary access arrangements or route realignments can be determined.
- Prepare an assessment of track condition, focusing on uneven surfaces, loose gravel, erosion, whether any topsoil remains, steepness, condition of creek crossings and proximity of cliff-lines. Incorporate information from the contamination survey and assessment. Identify any areas where vegetation would need to be removed to enable track works. Mapping erosion and safety hazards will allow council to prioritise sections of track needing early attention and inform detailed design of track upgrades.

- Conduct an assessment of the stability of cliff lines that are close to designated walking tracks to identify unacceptable safety risks (see also **Section 4.1.2**). Develop a safety management plan to mitigate potential safety risks associated with rock fall and uncontrolled access to cliff tops (see Guidelines for Trail Planning, Design and Management, Tourism Victoria 2015 https://www.mtba.org.au/wp-content/uploads/guidelines_for_trail_planning_design_and_management_280515.pdf for an example of an approach to this issue).
- Prepare detailed designs for track upgrades. The aim is that the tracks identified in the Concept Plan (**Figure 2.1**) will meet the track condition standards for Grade 3 or 4 of the Australian Walking Track Grading System (AWTGS) by 2032. Grade 4 is more likely for steep slopes with stairs while Grade 3 may be achieved on gently grades. The designs will incorporate:
 - Erosion and drainage controls.
 - Ground surface stabilisation and revegetation.
 - Sites and designs for stairs and ramps (if required).
 - Sites and designs for fences and railings (if required).
 - Signposting such as track routes and features, level of difficulty, so that people will have information about which routes are suitable for their group's capabilities.
 - Track surface materials.
 - Lookout points.
- Prepare a track works logistics plan, to address approvals, scheduling, access for construction materials, landholder agreements and ongoing maintenance inspections and works to maintain safety.
- Prepare detailed designs for trail head sites at Quarry Road (Speers Point) and off Blaxland Road (Macquarie Hills), or alternative points from Lakelands, such as Kanangra St (noting limited parking opportunities in small local streets). This will include:
 - Consult with local residents about traffic and other potential impacts on suburban streets (see Engagement Strategy in **Section 4.1.4**).
 - Identification of safe entry and exit points.
 - Locations and design of facilities such as toilets, picnic tables and signage (including content) and whether digital information is also provided.
 - Design of carparking, including materials, surfaces, lighting, drainage and security.
 - Assessment of environmental impacts of proposed works, including vegetation clearing, earthworks and potential impacts on Aboriginal objects.
- Installing security gates/fences on access points that are excluded from the Concept Plan (see **Section 2.4**). Consider also locking the trail head sites outside of daylight hours to mitigate illegal activities (note that this will require consultation with nearby landholders).
- Conduct surveys of visitor numbers and activities, to provide a review of the outcomes and benefits achieved by investment in tracks on Munibung Hill and monitor visitor numbers in real time to inform management practices and resourcing. This can be done with digital technologies.

- Prepare approval documentation (Review of Environmental Factors) for works to upgrade walking tracks and create trail head facilities:
 - Consistent with Natural Area - Bushland categorisation of Community Land and with requirements for Operational Land.
 - Consultation with agencies and community as required for environmental impact assessment.
 - Identify any actions which may need further approval from regulatory agencies.
 - Include vegetation clearance and ground disturbing works for the trailhead sites in the environmental assessment and approval process.
 - Include assessments, engagement and approval processes for disturbance of Aboriginal objects, Sensitive Aboriginal Cultural Landscapes (LMCC LEP) and other places of cultural significance.

4.2.3 Vehicle Access

Vehicle Access Strategy Vehicle access will be controlled. It is not proposed that private vehicles will access Munibung Hill for recreation over the life of this Management Plan.	
Management Objective Restrict access to vehicles entering Munibung Hill to essential service, maintenance, and emergency vehicles.	Management Target By 2023, Council and adjoining landholders agree on ongoing service vehicle access tracks. By 2025, access is controlled from points that are currently used for illegal vehicle access.

The management of vehicle access contributes to the management of three important environmental issues on Munibung Hill:

- Erosion and damage to track surfaces and creation of additional tracks.
- Damage to recovering vegetation.
- Increasing the risk of unplanned bushfire.

The approach to vehicle access has considered the potential to provide equity of access to experience the natural areas of Munibung Hill, for people of all abilities. Providing access to the ridge crest of Munibung Hill for people with limited mobility would require vehicle access on roads suitable for use by the general public. This is not feasible on Munibung Hill for the foreseeable future.

Council proposes that vehicles will be permitted on the land that it manages on Munibung Hill only for the following purposes:

- Access to telecommunications towers for maintenance.
- Access for fire management.
- Access to deliver materials for track stabilisation or vegetation management.
- Emergency response such as injuries to walkers.
- Ongoing maintenance.
- Any other reason Council determines, including cultural purposes.

Tracks necessary for access for these purposes have been identified. Locked gates or other control measures will be installed to prevent vehicles using tracks on council land for other purposes. Council will work with other landholders to provide vehicle access tracks which meet required standards for the designated uses.

Council will consult with telecommunication suppliers to confirm legal access for walkers through leases and to confirm the necessary track design and maintenance standards for emergency and maintenance access and access controls for other vehicles.

The nature of the terrain on Munibung Hill and the scale of work required to stabilise eroding slopes or remove invasive plant species mean that some controlled vehicle access will be required, to deliver materials such as timber and stone for step construction, and materials to stabilise sheet wash and deep rills on the ground surface around tracks.

Vehicle access is also required for emergencies and for fire management. There are existing access agreements for vehicles to provide maintenance to telecommunications towers located at two points on the ridge crest of Munibung Hill.

Conservation provides opportunities for the involvement of residents through Landcare activities and provides opportunities for low key education about natural and cultural heritage values. Participants in these activities would access the area on foot.

Council has carefully considered whether any existing vehicle tracks could be used to provide all ability access to the ridgeline of Munibung Hill within the life of the Management Plan. None of the existing tracks are suitable for safe public access. The tracks are narrow, steep (including steep slopes above and below) and not constructed for safe passing of vehicles.

Over the life of this Management Plan, Council will investigate any future potential for public vehicle access, in consultation with land-owners such as WAMC and Munibung Hill Pty Limited.

4.2.4 Stakeholder Engagement

Stakeholder Engagement Strategy

Engage stakeholders in planning and management activities to deliver a balance between social, cultural, and environmental values.

Management Objectives

All relevant landholders and stakeholders, including the Aboriginal community are consulted about detailed design and implementation of access improvement projects that affect their interests.

Targets

An ongoing mechanism for engaging the Aboriginal community in the management of Munibung Hill is established by 2025 and continues to function to the satisfaction of Aboriginal community representatives and Council.

Council regularly seeks feedback from residents in streets adjoining Munibung Hill about recreational access benefits and any impacts on local amenity or security.

Council has a constructive relationship with adjoining major landholders so that there is a consistent approach to land management activities to protect and restore natural environment and social values, and management issues that cross tenure boundaries are resolved efficiently and effectively.

Council has conducted a wide-ranging stakeholder and community engagement program during the preparation of the Management Plan (see Umwelt 2021d). Input from residents, major landholders and developers, and regulatory and land management authorities informed the strategic approach to management of Munibung Hill.

Council intends to maintain a stakeholder engagement program as the Munibung Hill Management Plan is implemented. There are multiple issues where a coordinated approach, or further consultation to clarify specific values and risks, will be necessary to achieve positive outcomes. These include:

- Aboriginal cultural heritage management.
- Vegetation and biodiversity management across land tenures, improving connectivity.
- Design standards for shared tracks, including access tracks to telecommunications towers.
- Negotiation of public access across private property.
- Fire management.
- Weed and pest management where they are moving across property boundaries.
- Assessing contamination constraint and land use opportunities on the WAMC land, which adjoins council's community land on the main north south ridgeline.
- Detailed design of parking and other facilities at trail head locations off suburban streets.
- To ensure that all relevant stakeholders have an opportunity to contribute to the development of sustainable solutions, Council will prepare an implementation engagement strategy. This strategy will build on the strategy developed for the planning phase of management of Munibung Hill. It will identify stakeholders and key contacts. It will outline the issues about which various stakeholders will be consulted and engagement activities relevant to government and community stakeholders, landholders, and regulators.
- The engagement strategy will include an information sharing and reporting protocol.

Implementation details are in **Table 5.3**.

4.3 Sustainable Economic Management

Policy

We will build prosperity for the people of Lake Macquarie City by encouraging economic growth and sustainable development. We will ensure cost effective delivery of works and services, as well as appropriate maintenance and renewal of our asset base within the framework of present and future financial sustainability.

Economic Management Strategy

Council investment in the management of Munibung Hill delivers strong public benefit, through enhancing natural assets and community well-being.

Management Objective

Capital and maintenance costs for recreational access on Munibung Hill are sustainable.

Targets

Investment in capital works for recreation on Munibung Hill is funded through a variety of sources, such as developer contributions, grants, and partnerships, over the life of this Management Plan.

Economic Management Strategy

Council investment in the management of Munibung Hill delivers strong public benefit, through enhancing natural assets and community well-being.

Partnership opportunities for funding are investigated and implemented where appropriate to cost effective delivery of public benefit.

The investigation and development of enhanced recreational opportunities on Munibung Hill is identified as an action in the Glendale Contributions Plan.

The Site Analysis, Values and Constraints Report (Umwelt 2021a) prepared to support the Management Plan highlights the biodiversity values of Munibung Hill and the importance of protecting and restoring biodiversity values as well as increasing public amenity and recreational opportunity. Good value public investment is linked to achieving these outcomes.

Council is committed to strong and transparent economic management. In relation to the management of Munibung Hill, over the life of this Management Plan, Council will demonstrate sustainable economic management with the following actions. Implementation details are in

Table 5.3.

- Developing recreational infrastructure (trail head and walking path) in a staged process, as outlined in **Section 2.3**. The first stage, which is the focus of this Management Plan, focuses on existing tracks and access points that are on Council land.
- Conducting feasibility assessments at the detailed design stage to confirm costs and benefits of track and trail head works (including capital costs and ongoing maintenance costs) are consistent with Council policies and provide good value for the community.
- Using funds from the Glendale Contributions Plan and relevant State Government grant programs to meet capital costs wherever feasible, with a target of 75% of capital costs from these sources.
- Developing partnerships with adjoining landholders to facilitate cost efficient project delivery. This may include maintenance of vehicle tracks on leases, which are also used by public pedestrians, and coordination of vegetation, fire, or track management works.
- Council will report investment in works on Munibung Hill in its annual reports, as required by the IP&R framework.

4.4 Sustainable Governance

Policy

We will demonstrate transparency, fairness, ethical practices and accountability. We will encourage and promote effective public-private and civil society partnerships.

4.4.1 Land Tenure

Land Tenure Strategy

Clarify land tenure boundaries in relation to recreation assets and develop a coordinated approach to management of issues that cross land tenures.

Management Objective	Targets
Tenure arrangements and planning requirements for potential access points are clarified.	<p>An additional District level public access point is agreed with landholders by 2032.</p> <p>Management of Munibung Hill consistently and transparently complies with approval requirements for works on public land.</p>

The Munibung Hill Management Area and the associated Investigation Area (see **Section 1.5**) is a mix of public and privately owned land. Critical land parcels to obtain broader public access are currently in private ownership (see Umwelt 2021a and Umwelt 2021c for details). The Council land includes Community land and Operational Land, with specific objectives and management requirements.

Management of the constraints to recreational use of Munibung Hill will be more effective and new opportunities are more likely to be identified with a collaborative approach, in which all parties have clear roles and responsibilities, but also have land management objectives for key land parcels that they agree on.

The actions in the Munibung Hill Management Plan will help all landholders to better understand the opportunities, connectivity, and trade-offs involved in securing recreational opportunities on Munibung Hill. In the longer term, this may require Council to consider land acquisition, planning controls or planning proposals or negotiation of easements, or it may require safe road crossings for pedestrians and cyclists, should feasible opportunities for a broader range of active and passive recreation be identified for current Investigation Areas.

Actions to address issues related to tenure issues include the following. Details of roles and responsibilities are in

Table 5.4.

- With WAMC and EPA, participate in the development of a future land management strategy for the WAMC land on the north-western slopes of Munibung Hill. This land is potentially contaminated, and parts are severely eroded. Erosion and contamination are a continuing risk local waterway health. Planning for recreational access to Munibung Hill cannot proceed until contamination status and management requirements are confirmed.
- Investigate access options across the norther ridgeline of Munibung Hill which could provide a recreational access connection to the north-east. There are several small parcels of land in key locations. The value of these for recreational access depends in part on the clarifying the future of the WAMC Land.

4.5 Summary of Operational Plans for Effective Management

The Munibung Hill Management Plan provides high level guidance on future recreational access and use aligned with protection and restoration of natural environment and cultural values of the place.

Effective and efficient delivery of the strategic direction outlined in the Concept Plan (Umwelt 2021d) and this Management Plan will require detailed operational planning. Issue specific operational plans are identified throughout Section 4, with further information in the tables in Section 5. These plans are summarised below.

Although the operational plans are identified individually, they could be parts (i.e. separate sections) within an overarching Munibung Hill Operational Plan. Some operational plans, such as the Central Coastal Bushfire Risk Management Plan, already apply to Munibung Hill.

The Tourism Victoria 2015 *Guidelines for Trail Planning, Design and Management* cover a wide range of issues to be addressed when developing trails for recreational use and illustrate the scope of planning considerations.

Summary of Operational Plan(s) or elements

Natural Environment

Vegetation Management Plan for the Management Area. Several of the biodiversity actions could be organised within this Vegetation Management Plan, which should also provide for consistent management of biodiversity values in bushland across land tenure boundaries, wherever possible.

Track erosion stabilisation plan for tracks on Council land within the Management Area.

Long-term environmental management plan that addresses residual contamination on walking tracks on Council land in the first instance and subsequently contamination risks on WAMC land if that is later included in the Management Area. (i.e. residual contamination plan).

Social and Cultural

Framework for Aboriginal community engagement and participation.

Safety management plan to mitigate potential safety risks associated with rock fall and uncontrolled access to cliff tops.

Track works logistics plan - to address approvals, scheduling, access for construction materials, landholder agreements and ongoing maintenance inspections and works to maintain safety.

Vehicle access plan, to provide a detailed framework for operational vehicle access.

Implementation engagement strategy for Munibung Hill.

5.0 Implementation Action Plans

Table 5.1 **Actions for Sustainable Environmental Management**

Action ID	Action	Rationale	Priority	Lead role	Stakeholders and partners	Indicative costs	Accountability (monitor and report outcomes)	Alignment	Other notes
Biodiversity Strategy									
B1	<p>Prepare a Vegetation Management Plan (VMP) for Council land on Munibung Hill. Include coordination across land tenure boundaries, considering an existing vegetation management plan on land owned by Munibung Hill Pty Limited. The Vegetation Management Plan will provide details of priority actions and guidance on the approach to protect and restore ecological communities and ecological condition. This includes:</p> <ul style="list-style-type: none"> minimising the extent of additional disturbance or vegetation clearance required to upgrade designated walking tracks and the two trail head locations. targeted planting to restore vegetation in association with track surface stabilisation and erosion controls (see also Erosion and Land Stability Strategy). informing bushfire management to protect sensitive ecological communities (see Bushfire Management Strategy). 	To provide a structured approach to biodiversity issues such as protecting threatened species and endangered ecological communities, reducing the impacts of invasive species and track rehabilitation.	High	LMCC	Munibung Hill Pty Limited DPIE WAMC	\$50,000	Vegetation Management Plan for the Council land on Munibung Hill is prepared by end 2022.	LMCC Plan of Management for Community Land 2011 LMCC 2021 Natural Areas Management Guidelines (draft). Existing Vegetation Management Plan for land owned by Munibung Hill Pty Limited, within the Management Area	<p>The Vegetation Management Plan will also set out, as relevant</p> <ul style="list-style-type: none"> measures to manage safety risks associated with access to cliff lines, such as planting dense and prickly vegetation to discourage access measures to manage access to rock shelter sites which have Aboriginal cultural significance. dense planting can help to discourage access.
B2	<p>Close access to existing tracks on Council land, other than those designated in this strategy (see also Vehicle Access strategy below). This will involve gates or barriers to prevent trail bike and other off road vehicle access.</p>	To provide an opportunity for tracks to be rehabilitated and reduce the spread of weed species.	Medium	LMCC	Lease holders (telecommunications towers) NSW Fire Brigade Emergency service providers Local residents to the south and east of Munibung Hill Munibung Hill Pty Limited WAMC	\$250,000 (assume up to 7 gates or barriers in the first instance – this may need to be reviewed, in consultation with service providers)	Key tracks which allow vehicle access onto Council land have barriers installed to control illegal access and protect the biodiversity and cultural values of the place.	Vegetation Management Plan for Munibung Hill. Aboriginal engagement and participation framework.	<p>A communications program may be necessary to explain vehicle exclusion actions, as both 4WD vehicles and trail bikes access some tracks. engaging local residents will be important.</p>

Action ID	Action	Rationale	Priority	Lead role	Stakeholders and partners	Indicative costs	Accountability (monitor and report outcomes)	Alignment	Other notes
B3	Conduct a baseline survey of invasive plant species on Council land. The baseline survey is to include the land on Munibung Hill, the two trail head sites and the tracks from the trail head sites onto the Hill. Repeat at 5 yearly intervals.	To provide data on weed distribution across council land, including species present and severity of impacts; and to provide evidence for weed management across the Council land. The baseline weed survey will inform the Vegetation Management Plan.	High (likely to be part of the VMP)	LMCC	Landcare Hunter Local Land Services	\$30,000	Baseline data on the distribution of invasive plant species is available, so that progress can be monitored and reported annually	Vegetation Management Plan for Munibung Hill and adjoining land Regional weed management and Biosecurity Plans	
B4	Prepare a baseline survey of ecological communities and species on Council Land. <ul style="list-style-type: none"> The survey should include Threatened vegetation species Habitat and presence of threatened animal species Extent and condition of endangered ecological communities Canopy cover across the site Follow up with repeat surveys at 5 yearly intervals. Ensure that relevant ecological data bases are updated with new results. 	To provide data against which improvements in the condition of ecological communities can be measured. The baseline ecological community survey will inform the Vegetation Management Plan.	High (likely to be part of the VMP)	LMCC	Landcare WAMC DPIE	\$30,000	Baseline data are available to measure progress in rehabilitation of locally indigenous vegetation communities on the site.		Note the <i>Angophora inopina</i> reserve on the northern slopes of Munibung Hill is on land managed by WAMC, which is outside the Management Area
B5	Conduct weed control and bush regeneration programs on Council land, in accordance with the Vegetation Management Plan and with priorities supported by the baseline surveys (Actions B3 and B4).	Programs to cover <ul style="list-style-type: none"> the trail head sites, to reduce opportunity of spread of weeds from those sites footslope access tracks ridge crest trail. 	Medium and ongoing	LMCC	Landcare	Allow \$20,000 for material per year. Council staff time for supervision	Monitoring of reductions in the diversity and extent of invasive plant species monitoring of increase in canopy cover across currently bare areas	Munibung Hill Vegetation Management Plan LMCC 2021 Natural Areas Management Guidelines (draft).	Clarify contamination risks before commencing ground disturbing works relating to weeds and track surfaces. Conduct Aboriginal heritage assessments for areas proposed for any ground disturbing works
B6	Engage with private landholders and WAMC to coordinate works requiring ground disturbance and to coordinate the implementation of vegetation management plans across land tenures.	To provide for a consistent approach to ecological values across land tenures and to increase the efficiency of land management.	Medium and ongoing	LMCC	Munibung Hill Pty Limited WAMC Landcare Green Capital Other landholders	LMCC staff time	Evidence of consistent approaches to managing bushland that is zoned E2 Environmental conservation	Munibung Hill Vegetation Management Plan LMCC 2021 Natural Areas Management Guidelines (draft).	May require further discussion about future tenure arrangements
B7	Include biodiversity conservation information in signage at trail head sites.		Low	LMCC		Allow \$10,000 for signage or App information at the two trail head sites and at key vantage points on the ridgeline			The biodiversity information is one part of information to be provided on signage at trail head sites.

Action ID	Action	Rationale	Priority	Lead role	Stakeholders and partners	Indicative costs	Accountability (monitor and report outcomes)	Alignment	Other notes
B8	Engage adjoining residential landholders in biodiversity management programs, especially in relation to garden escapees, domestic pet management and management of plant waste from gardens.		Moderate and ongoing	LMCC	Local Land Services Landcare Local residents	LMCC staff time,	Results from ongoing surveys of invasive species distribution Landholder feedback from engagement programs	Lake Macquarie ESSAP	Within a broader city wide program of landholder engagement about invasive species
Erosion and slope stability Strategy									
E1	Prepare an assessment of erosion and track surface condition for designated tracks from the Concept Plan, on Council land. Map, assess and prioritise erosion areas on tracks.	To provide information so that a risk-based approach to track management can be implemented. Only general information about the extent of erosion is currently available	High	LMCC	Soil Conservation Service (or other providers) Local Land Services	\$25,000	This is the first step to a structured approach to erosion management on tracks and adjacent areas. Outcome is a clear map of erosion management priority to inform track design		Existing tracks on steep slopes and disturbed land are severely eroded and have poor drainage control. some sections are not currently safe for general community access. Note some tracks are on land owned by Munibung Hill Pty Limited. A similar assessment is needed for those tracks
E2	Prepare assessments of cliff stability and potential risks for pedestrians at the base of cliffs. Also assess the potential risks associated with pedestrian access to cliff tops that are close to the designated walking tracks. (note Action AT3 adds a safety management plan to this assessment)	To clarify the extent of risk associated with access to cliff lines and potential rock fall from natural cliffs and the high wall of the old Speers Point Quarry. Risks to visitors to Munibung Hill, on Council land, present an uncertain but potentially significant liability to Council.	High	LMCC	Specialist geotechnical risk assessment providers	\$25,000 (see also AT3)	This is essential information to support detailed track design and access management. Outcome is a clear statement of risk to inform track design and access management		
E3	Prepare a track erosion stabilisation plan for tracks on Council land within the Management Area. This will include: <ul style="list-style-type: none"> Developing measures to stabilise and remediate different sections of track to improve user safety and reduce sediment loss, including detailed designs, materials, logistics and costing Considering measures for creek crossings Improvements to track drainage Potential rerouting to allow remediation of severely eroded sections Integrating track design and structures (stairs, ramps etc) with the erosion control measures (see AT4). 	To guide detailed track design and works planning. This detailed design for erosion management on the designated walking tracks is the core recreational access task for Munibung Hill.	Medium	LMCC	Soil Conservation Service or other specialist providers	\$40,000	A costed and funded plan for track stabilisation, ready for inclusion in annual Operational Plans		Detailed erosion control designs, vegetation management on tracks and design of access structures on tracks (steps etc) provide an integrated package for initial track upgrades and ongoing maintenance issues. Note also the connection to contamination management.

Action ID	Action	Rationale	Priority	Lead role	Stakeholders and partners	Indicative costs	Accountability (monitor and report outcomes)	Alignment	Other notes
E4	Conduct impact assessment (Part 5) and feasibility assessment for proposed track stabilisation measures, and identify priority works in Council's annual operational plans. Prepare relevant approvals documentation for all works, consistent with the Community Land Plan of Management and management of operational land; and council's draft Natural Areas Management Guidelines.		Medium Essential before works can commence, but timing depends on when key studies are complete.	LMCC	Service providers and lease holders Adjoining private landholders	Council staff time. May be supplemented by consultant, allow \$60,000 for overarching approval	Approvals are in place for all works to be carried out each year.		
E5 (see also AT5)	Prepare detailed designs for measures to reduce safety risks associated with cliff lines, including rock fall and unmanaged access high rock faces. Measures will be appropriate for the level of risk and may include dense vegetation planting, fencing, formalised lookout points, safety signage, track realignment. Prepare feasibility assessment for the high-risk sites and prepare approvals for preferred works.	To mitigate safety risks associated with access to the tops of cliffs and potential rock fall from cliff faces.	Medium These designs will be incorporated into the safety management plan	LMCC		\$30,000 for designs. Installation costs will depend on preferred approach	Risk mitigation measures appropriate to the level of risk are in place by 2025		Safety management should be a high priority, as Council will now be inviting the community to visit Munibung Hill and views from elevated vantage points are a key community value.
Contamination Management Strategy									
C1	Consult with WAMC, an appropriately qualified contaminated land consultant and an EPA accredited Site Auditor about the design of a sampling program to clarify contamination levels and depths on and adjacent to the designated walking tracks on Council land from the Concept Plan. Implement the sampling program and consider the results in all detailed planning for track remediation works and design	To clarify a key potential risk to recreational use of Council land and ground truth modelling results. Essential information to develop erosion management plans, and track designs; designs for viewing point structures	High	LMCC	EPA WAMC	Council staff time; allow \$40,000 for testing, analysis and reporting	Council has clear data about the nature of contamination in topsoils and other materials on and adjacent to the designated walking tracks.	standards for recreational use of contaminated land	Sampling and testing program must meet appropriate standards and guidelines. Note that the track from Quarry Road is on land owned by Munibung Hill Pty Limited. A similar testing program is required for that land. Approach and logistics to be discussed with the land owner.
C2	Consult with WAMC, an appropriately qualified contaminated land consultant and an EPA accredited Site Auditor about developing and implementing a contamination sampling program across the land now managed by WAMC on the western and north-west slopes of Munibung Hill. The contamination status of this land has not been tested in detail. The contamination assessment could be conducted in parallel with assessment of ground surface condition as parts of the WAMC land have extensive erosion.	To clarify a key risk affecting future recreational access to the WAMC land and enable detailed planning if access is feasible. Will enable discussions about appropriate future land ownership and ongoing management responsibilities.	Moderate	LMCC	WAMC EPA DPIE - Planning	Council staff time. Contamination testing would be the responsibility of WAMC	Council has clear evidence to support decisions about land tenure and recreational access beyond the tracts designated in the current Concept Plan	Standards for recreational use of contaminated and	As above

Action ID	Action	Rationale	Priority	Lead role	Stakeholders and partners	Indicative costs	Accountability (monitor and report outcomes)	Alignment	Other notes
C3	<p>Develop a long-term environmental management plan that addresses residual contamination on the site and any controls required for the use of walking tracks designated in the Concept Plan.</p> <p>The long-term environmental management plan should also cover track surface stabilisation.</p> <p>This plan will relate in the first instance to the designated tracks on Council land that are part of the Concept Plan.</p> <p>Depending on the outcomes of C2 and further discussion with the Site Auditor and WAMC about the potential for rehabilitation and recreational use of the WAMC land, the long-term environmental management plan (covering contamination and track erosion stabilisation) would be extended to cover the relevant part of the WAMC land.</p>	To ensure that contamination issues and risks are understood and are incorporated into the detailed design of track remediation and upgrades.	Medium	<p>LMCC for the Council land.</p> <p>WAMC for studies on WAMC land</p>	EPA WAMC	\$25,000	The long-term environmental management plan addresses contamination risks, including safety for workers engaged in soil erosion works and track upgrades, and safety of recreational users.	Standards for recreational use of contaminated land	Consider also the land owned by Munibung Hill Pty Limited, to provide a complete contamination assessment for any land proposed to be used for public recreation.
Fire Management Strategy									
F1	<p>Manage bushfire hazards on Munibung Hill in accordance with LMCC roles and responsibilities set out in the Central Coast Bushfire Risk Management Plan.</p> <p>This will include:</p> <ul style="list-style-type: none"> maintaining service trail access for emergency vehicles coordinating with NSW Fire brigade and adjoining land-owners to prepare a coordinated hazard reduction works program that delivers consistent outcomes across various land tenures on Munibung Hill engaging the Aboriginal community in hazard management, including the potential for use of cultural burning techniques design hazard reduction and other fire management to protect threatened species and endangered ecological communities on Munibung Hill manage hazard reduction activities to protect recovering vegetation and control (not encourage) invasive plant species providing appropriate fire egress routes and signage for recreational users of Munibung Hill if unplanned fire events occur. 	<p>Bushfire on Munibung Hill presents risks to the recovery of sensitive vegetation communities and also to recreational users.</p> <p>Recreational users are also a potential source of ignition, so signage should</p>	Medium	LMCC	<p>Adjoining landholders</p> <p>NSW Fire and Rescue</p> <p>Central Coast Bushfire Management Committee</p> <p>Fire and Rescue NSW</p> <p>NSWRFS</p>	Council staff time, other costs to be determined in accordance with the Central Coast Bushfire Risk Management Plan	Council management of tracks on Munibung Hill complies with the CCBRMP	Central Coast Bush Fire Risk Management Plan	Fire management will require cooperation by multiple adjoining landholders

Table 5.2 Social and Cultural Sustainability Actions

Action ID	Action	Rationale	Priority	Lead role	Stakeholders and partners	Indicative costs	Accountability (monitor and report outcomes)	Alignment	Other notes
Culture and Heritage Strategy									
CH1	Consult with Aboriginal community stakeholders about the preferred methods for ongoing consultation and involvement in the future management of Munibung Hill, noting its high cultural value and the potential for it to be gazetted as an Aboriginal Place.	Munibung Hill has a very high cultural value and both sites and intangible cultural values to be protected. Aboriginal community involvement includes statutory requirements for consultation about AHIPs for sites, but there are wider issues and opportunities in the management of Munibung Hill as a place.	High	LMCC with Land Councils	NSW Heritage Office Biraban Local Aboriginal Land Council Awabakal traditional owner group Miromarr Awabakal Language Centre Aboriginal community members involved in the Yapang Awabakal Local Aboriginal Land Council Council's Aboriginal liaison officer	Internal Council staff costs	This is a preliminary step to enable the development of an Aboriginal community engagement strategy for the delivery of management actions on Munibung Hill. The outcome is a preferred approach to engagement, that is inclusive and practical.	Lake Macquarie Aboriginal Community Plan Lake Macquarie Aboriginal Cultural Heritage Strategy Depending on outcomes of the separate process, the Management Plan for a gazetted Aboriginal Place.	
CH2	Develop and implement an ongoing governance and engagement framework for Aboriginal culture on Munibung Hill. The engagement framework should include who will be involved and whether engagement will be driven by statutory compliance or broader values. It should address consultation measures and decision-making processes in relation to the following issues: <ul style="list-style-type: none"> the potential disturbance of Aboriginal objects, which are protected under the NPW Act. There are statutory requirements for consultation about cultural values when an Aboriginal Heritage Impact Permit (AHIP) is required. detailed design and track alignment, including works to control erosion, construction of steps and ramps and other ground disturbing works development of trail head facilities, including parking and signage fire management, including the potential for cultural burning practices, and protection of cultural sites and places if works are required on fire trails interpretation – knowledge to be shared, or not and appropriate locations and design of signage 	To provide clear and structured roles and responsibilities, and opportunities to be involved in the management of a place that is important to Awabakal people.	High	LMCC and Aboriginal community	NSW Heritage Office Other adjoining landholders, including WAMC See also Design with Country guidance from NSW Government Architect	Cost will depend on the model adopted by Council and the Aboriginal community. Will include costs for council staff time and potentially session payments for Aboriginal stakeholders	Aboriginal community representatives are satisfied with the level of engagement offered and that their cultural values are appropriately protected	DPIE Guidelines for preparation of AHIPs LMCC Aboriginal Community Plan LMCC Aboriginal Cultural Heritage Management Strategy NSWGA design with Country Discussion Paper	Council will need to maintain consultation with the NSW Heritage Office about their assessment of the Aboriginal Place nomination and implications for Council as a key land-owner and manager on Munibung Hill. If an Aboriginal Place is gazetted, a Management Plan to protect the values for which it was gazetted must be prepared. The Aboriginal Place Management Plan and the Munibung Hill Management Plan need to be closely aligned in terms of permitted uses, potential protection precincts, and approval requirements. Note that an AHIP is required for most works in an Aboriginal Place, unless specifically excluded in agreement with the Aboriginal community and NSW Heritage Office.

Action ID	Action	Rationale	Priority	Lead role	Stakeholders and partners	Indicative costs	Accountability (monitor and report outcomes)	Alignment	Other notes
	<ul style="list-style-type: none"> whether any on ground works would be done by Aboriginal contractors or works teams, demonstrating stewardship practice potential future use of investigation areas, subject to the results of contamination studies ongoing reporting about the level of protection of Aboriginal cultural values 								
Access and Track Management Strategy									
AT1	Arrange a full survey of the boundaries of Council owned land on Munibung Hill.	Council needs to be certain about which land parcels existing track alignments are located on – Council land or adjoining private land of WAMC land, so that any necessary arrangements, leas negotiations or route realignments can be determined	High	LMCC	Munibung Hill Pty Limited WAMC Other land developers (e.g. to the east)	\$40,000	A clear boundary has been identified and is marked on the ground		Many of the existing tracks have been in place for decades and there have been multiple changes of tenure over the life of the tracks.
AT2 (see E3 and C1)	Prepare an assessment of track condition focusing on uneven surfaces, loose gravel, erosion, whether any topsoil remains, steepness, condition of creek crossings and proximity of cliff-lines. Incorporate information from the contamination survey and assessment. Identify any areas where vegetation would need to be removed to enable track works.	See E3 and C1	High	LMCC	See E3 and C1	Could be done by Council staff, or allow \$25,000 for a natural areas recreation planner to prepare	See E3 and C1		
AT3 (see E2)	Prepare an assessment of the stability of cliff lines within 50 metres of designated walking tracks, to identify unacceptable safety risks. Develop a safety management plan to mitigate potential safety risks associated with rock fall and uncontrolled access to cliff tops	See E2	High Safety management plan is medium priority	LMCC	See E2 Requires a specialist geotechnical risk assessor	See E2 (\$25,000 for risk assessment). Indicative total including the safety plan \$40,000.	See E2		
AT4 (see E3)	Prepare detailed designs for track upgrades. The aim is that the tracks identified in the Concept Plan (Figure 2.1) will meet the track condition standards of the Australian Walking Track Grading System (AWTGS) (Grades 3 and 4) by 2032. The designs will incorporate: <ul style="list-style-type: none"> erosion and drainage controls ground surface stabilisation and revegetation sites and designs for stairs and ramps (if required), 	This is the detailed track design component of track management, which is to be combined with erosion control measures in E3	Medium – requires other studies and plans to be completed before this can be done	LMCC	Aboriginal community NSW Heritage Office Soil Conservation Service/Crown Lands/NPWS for guidance on effective track designs	\$50,000	Designs are prepared and supported by key stakeholders	Australian Walking Track Grading System Australian Standards for walking tracks Council engineering guidelines	Grade 3 and grade 4 will apply to different sections of track, depending on steepness, existing condition, likelihood of use by diverse abilities etc.

Action ID	Action	Rationale	Priority	Lead role	Stakeholders and partners	Indicative costs	Accountability (monitor and report outcomes)	Alignment	Other notes
	<ul style="list-style-type: none"> sites and designs for fences and railings (if required) signposting such as track routes and features, level of difficulty, so that people will have information about which routes are suitable for their group's capabilities track surface materials. 								
AT5	Prepare a track works logistics plan, to address approvals, scheduling, access for construction materials, landholder agreements and ongoing maintenance inspections and works to maintain safety	To guide construction projects that will be included in the Operational Plans in the medium term	Medium The logistics plan depends on completion of earlier studies that are assessed as high priority	LMCC		\$25,000 Most can be done by internal staff	Detailed practical planning for track upgrades is prepared and works schedules can be developed. These will include safety requirements for workers		
AT6	Prepare approval documentation (Review of Environmental Factors) for works to upgrade walking tracks and create trail head facilities: <ul style="list-style-type: none"> consistent with Bushland categorisation of Community land and with requirements for Operational Land Consultation with agencies and community as required for environmental impact assessment identify any actions which may need further approval from regulatory agencies. Include vegetation clearance and ground disturbing works for the trailhead sites in the environmental assessment and approval process. Include assessments, engagement and approval processes for disturbance of Aboriginal objects, Sensitive Aboriginal Cultural Landscapes (LMCC LEP) and other places of cultural significance. 	To ensure that all environmental and social issues affecting the project are properly assessed	Medium	LMCC	Local residents Aboriginal community stakeholders Other landholders such as Munibung Hill Pty Limited and WAMC	Mostly can be done by internal staff			
AT7	Prepare detailed designs for trail head sites at Quarry Road (Speers Point) and off Blaxland Road (Macquarie Hills). These will include: <ul style="list-style-type: none"> consulting with residents about traffic and other potential impacts on suburban streets (see Action SE1 below). identification of safe entry and exit points. 	Neither of the proposed track head sites currently has vehicle access for parking, or facilities for walkers. Both sites are vegetated (Blaxland Rd primarily native vegetation, Quarry Road rehabilitation plantings and invasive species). Suggest these are designs, not construction drawings.	consultation and studies: High Detailed designs: Medium	LMCC	Local residents Aboriginal stakeholders Munibung Hill community groups	\$150,000 noting the range of features and engineering issues to be addressed	Design themes are prepared and accepted. Key facilities and assets for each site and layout is prepared. public has an opportunity to comment on designs.	Council strategies such as Parks and Play, Facilities, Paths/Cycling etc. Council engineering standards. Track head design guidance from Australian Standards and Walking Track guidelines.	Track head sites are a key features of activating recreational access to Munibung Hill, so practical and environmentally sound designs are essential.

Action ID	Action	Rationale	Priority	Lead role	Stakeholders and partners	Indicative costs	Accountability (monitor and report outcomes)	Alignment	Other notes
	<ul style="list-style-type: none"> locations and design of facilities such as toilets, picnic tables and signage (including content) design of carparking, including materials, surfaces, lighting, drainage. assessment of environmental impacts of proposed works, including vegetation clearing, earthworks. 								
AT8	Construct upgraded tracks with sections of track delivered in priority order (e.g. to address highest safety and amenity risks first).	This action will enable community access and the goal of the Management Plan.	Medium Track construction cannot commence until other actions have been completed.	LMCC	Service providers, local communities, Aboriginal stakeholders	High – actual cost to be determined from the design studies, feasibility studies and approvals process.	Upgraded tracks meet relevant track standards Community feedback and satisfaction with upgraded tracks and access.	Australian Walking Track Standards	
AT9	Conduct surveys of visitor numbers and activities, to provide a review of the outcomes and benefits achieved by investment in recreational access to Munibung Hill.	To build evidence of the recreational response to track upgrades and the broader social and economic benefits for the Lake Macquarie community.	Medium, to commence after tracks are upgraded.	LMCC	Recreational users of Munibung Hill	\$15,000	Council has baseline data on usage that is robust enough to be used to assess growth in use over time		Use data from consultation for the Management Plan to provide an indication of baseline use. This is an opportunity to try technology to refine user numbers and obtain feedback on user experiences.
Vehicle Access Strategy									
VA1	Install security gates/fences or other barriers on access points that are excluded from the Concept Plan. Consider also locking the trail head sites outside of daylight hours to mitigate illegal activities (including consultation with nearby landholders).	To control recreational access; to protect biodiversity and Aboriginal culture and ensure safety to the tracks. To discourage antisocial behaviour.	Medium Must be preceded by engagement with local communities about changes to access.	LMCC	Service providers Private landholders consult NPWS and Crown lands for advice on effective controls.	High, to create barriers that work and can be maintained.	Access barriers are installed and function to control access by trail biked and four-wheel drive vehicles to sensitive areas.		Note the difficulties of maintaining access barriers at other sites around Lake Macquarie, including Belmont Wetlands State Park and Wallarah National Park.
VA2	Consult with telecommunication suppliers and emergency services to <ul style="list-style-type: none"> confirm legal access for walkers through leases confirm the necessary track design and maintenance standards for emergency and maintenance access and access controls for other vehicles. 	To ensure that access tracks needed for service and emergency vehicles are accessible To provide for safe and legal pedestrian access and exclude other recreational uses of designated tracks over the life of this plan.	High	LMCC	Telecommunications Tower operators/lessees NSW Fire Brigade Council works teams Other emergency services WAMC Munibung Hill Pty Limited	Council officer time	Legal access for recreational users is confirmed in writing. Confirmed agreements on emergency and maintenance access	Existing lease terms. Note also some tracks are on private land.	

Action ID	Action	Rationale	Priority	Lead role	Stakeholders and partners	Indicative costs	Accountability (monitor and report outcomes)	Alignment	Other notes
VA3	Over the life of this Management Plan, Council will investigate any future potential for public vehicle access, in consultation with land-owners such as WAMC and Munibung Hill Pty Limited.	There is interest in the community for people with a disability to be able to access and enjoy the natural areas and views from Munibung Hill. This access is not currently feasible. Tracks are not on Council land and are steep, not designed for public access.	Medium- Low (over the life of the Plan)	LMCC	WAMC Munibung Hill Pty Limited Other landholders such as Green Capital and landholders east of Munibung Hill.	Council officer time	Other track options for public vehicular access are confirmed		
Stakeholder engagement strategy									
SE1	Prepare an implementation engagement strategy for Munibung Hill	To identify all relevant stakeholders, interests, relevant issues, and how they will engaged as the Management Plan is implemented.	High	LMCC	All previously identified public and private stakeholders (see the stakeholder identification in Umwelt 2021d).	Council staff time *assumed for both development and implementation)	Engagement strategy prepared to support the management of other areas of public land around Lake Macquarie, noting that successful management of recreational uses on Munibung Hill requires the involvement of private landholders.	Council stakeholder engagement policies and guidelines	Opportunities to use technology as part of comms and engagement processes.

Table 5.3 Actions Relating to Sustainable Economic Management

Action ID	Action	Rationale	Priority	Lead role	Stakeholders and partners	Indicative costs	Accountability (monitor and report outcomes)	Alignment	Other notes
Sustainable Economic Management Strategy									
EM1	Develop recreational infrastructure (trail head and walking path) in a staged process. The first stage, (this Management Plan), focuses on existing tracks and access points that are on Council land.	The site analysis, context and constraints report (Umwelt 2021a) highlights the current limitations on safe recreational access and use of Munibung Hill. The Management Plan shows how council will deliver access defined in the Concept Plan, which recognises these limitations. Further investigations and negotiation over the next ten years may lead to more opportunities for recreational access.	Actions as identified in this Implementation Action Plan (Medium to Low, as detailed designs and approvals are prepared)	LMCC	WAMC Private landholders	As set out in this Management Plan and refined by Council officers	Council will report investment in works on Munibung Hill in its annual reports, as required by the IP&R framework.		
EM2	Conduct feasibility assessments at the detailed design stage to confirm costs and benefits of track and trail head works (including capital costs and ongoing maintenance costs) are consistent with Council policies and provide good value for the community.	Council aims to provide public benefit and good value by managing costs and benefits carefully. Several cost items to implement the Munibung Hill Management Plan cannot currently be determined, because additional studies and reviews are required before capital works can commence. Ongoing feasibility review will provide clear evidence of the costs and benefits of improving recreational access to Munibung Hill.	High	LMCC	The community of Lake Macquarie City. Potential funding sources outside council (grant providers)	Council officer time, across multiple divisions.	Council will report investment in works on Munibung Hill in its annual reports, as required by the IP&R framework.	Council policies and guidelines.	
EM3	Use funds from the Glendale Contributions Plan and relevant State Government grant programs to meet capital costs wherever feasible.	Developer contributions from new development in the North West Growth Area and catalyst area can be used to augment recreational facilities to meet the needs of a growing community. Council will continue to monitor grant opportunities across community development and regional development portfolios.	Grant planning and operational budget management: High and ongoing	LMCC	NSW Government, (DPIE - Department of Planning)	Costs are for council staff to administer the s.711 funds and other potential grant funds. Staff time only.	Council will report investment in works on Munibung Hill in its annual reports, as required by the IP&R framework.	Glendale Contributions Plan State Government directions on the use and reporting of s.711 funds. https://www.planning.nsw.gov.au/-/media/Files/DPE/Circulars/planning-circular-21-002-reporting-and-accounting-requirements-2021-02.pdf?la=en	Note some proposed changes to the way councils use s.711 funds

Action ID	Action	Rationale	Priority	Lead role	Stakeholders and partners	Indicative costs	Accountability (monitor and report outcomes)	Alignment	Other notes
EM4	Develop partnerships with adjoining landholders to facilitate cost efficient project delivery. This may include maintenance of vehicle tracks on leases, which are also used by public pedestrians, and coordination of vegetation, fire or track management works.	<p>Council does not own the land on which access from the south (this Management Plan) or potential access from the west, north-west or north-east could be developed.</p> <p>Access from these directions is not proposed in this Management Plan.</p> <p>Council will investigate appropriate agreements with relevant landholders and lease holders to enable public access to Council land, and to enable better environmental and social outcomes.</p>	Ongoing	LMCC	WAMC Private landholders Service providers	Council officer time	Council will report investment in works on Munibung Hill in its annual reports, as required by the IP&R framework.		

Table 5.4 Sustainable Governance

Action ID	Action	Rationale	Priority	Lead role	Stakeholders and partners	Indicative costs	Accountability (monitor and report outcomes)	Alignment	Other notes
Land Tenure Strategy									
LT1	With WAMC and EPA, participate in the development of a future land management strategy for the WAMC land on the north-western slopes of Munibung Hill. This land is potentially contaminated, and parts are severely eroded. Erosion and contamination are a continuing risk local waterway health.	Planning for recreational access to Munibung Hill cannot proceed until contamination status and management requirements are confirmed.	Medium	WAMC	LMCC EPA Other land developers Requires services of an EPA accredited site auditor	Council staff time. WAMC would have responsibility for other investigation and planning costs	WAMC reporting on the extent of contamination of its land and how contamination can be managed to enable benefits for the growing community in the area.	Precinct plans for Munibung area, including Cockle Creek Precinct Area Plan 2021	
LT2	Investigate access options across the northern ridgeline of Munibung Hill which could provide a recreational access connection to the north-west or north-east.	There are several small parcels of land in key locations (see Umwelt 2021c). The value of these for recreational access depends in part on the clarifying the future of the WAMC Land.	Medium	LMCC	Land developers to the north and east. Currently Green Capital is a key landholder	Council staff time.		Cockle Creek Precinct Area Plan 2021 North West Catalyst Area planning documents	
Council land categorisation									
CL1	Confirm the categorisation of land on Munibung Hill, to ensure proposed uses, works and funding arrangements are consistent with categorisation.	The most frequently used and preferred access route from the east onto the Munibung Hill ridgeline is currently Operational Land, not community Land.	High	LMCC	Service providers Office of Local Government	Council staff time	Report in Council meetings and Annual reports	<i>Local Government Act</i> and policies for the management of public land by local councils	

6.0 References

Department of Planning, Industry and Environment (DPIE) (2018). Greater Newcastle Metropolitan Plan 2036.

Department of Planning, Industry and Environment (DPIE) (2016). Hunter Regional Plan 2036

Department of Planning, Industry and Environment (DPIE) (2021). Planning Circular: Reporting and accounting requirements for infrastructure contributions

Department of Sustainability and Environment Victoria (undated). Users Guide to the Australian Walking Track Grading System.

Lake Macquarie City Council (LMCC) (2011). Plan of Management for Community Land.

Lake Macquarie City Council (LMCC) (2015) Glendale Developer Contributions Plan

Lake Macquarie City Council (LMCC) (2017). Lake Macquarie City Community Strategic Plan 2017-2027.

Lake Macquarie City Council (LMCC) (2019). Imagine Lake Mac: 2050 and Beyond.

Lake Macquarie City Council (LMCC) (2020). Lake Macquarie Local Strategic Planning Statement.

Lake Macquarie City Council (LMCC) (2020). Environmental Sustainability Strategy and Action Plan 2020-2027

Lake Macquarie City Council (LMCC) (2021). Natural Areas Management Guidelines (draft)

Lake Macquarie City Council (LMCC) (2021). Parks and Play Strategy

Lake Macquarie City Council (LMCC) (2021). Public Amenities Strategy

Lake Macquarie City Council (LMCC) (2021). Walking, Cycling and Better Streets Strategy

Lake Macquarie City Council (2021). Cockle Creek Precinct Area Plan

National Parks and Wildlife Service (NPWS) (website 2021). Australian Walking track Grading System (based on Australian Standard AS2156) <https://www.nationalparks.nsw.gov.au/safety/bushwalking-safety/australian-walking-track-grading-system>

National Parks and Wildlife Service (NPWS) (2011). Sustainable Mountain Biking Strategy.

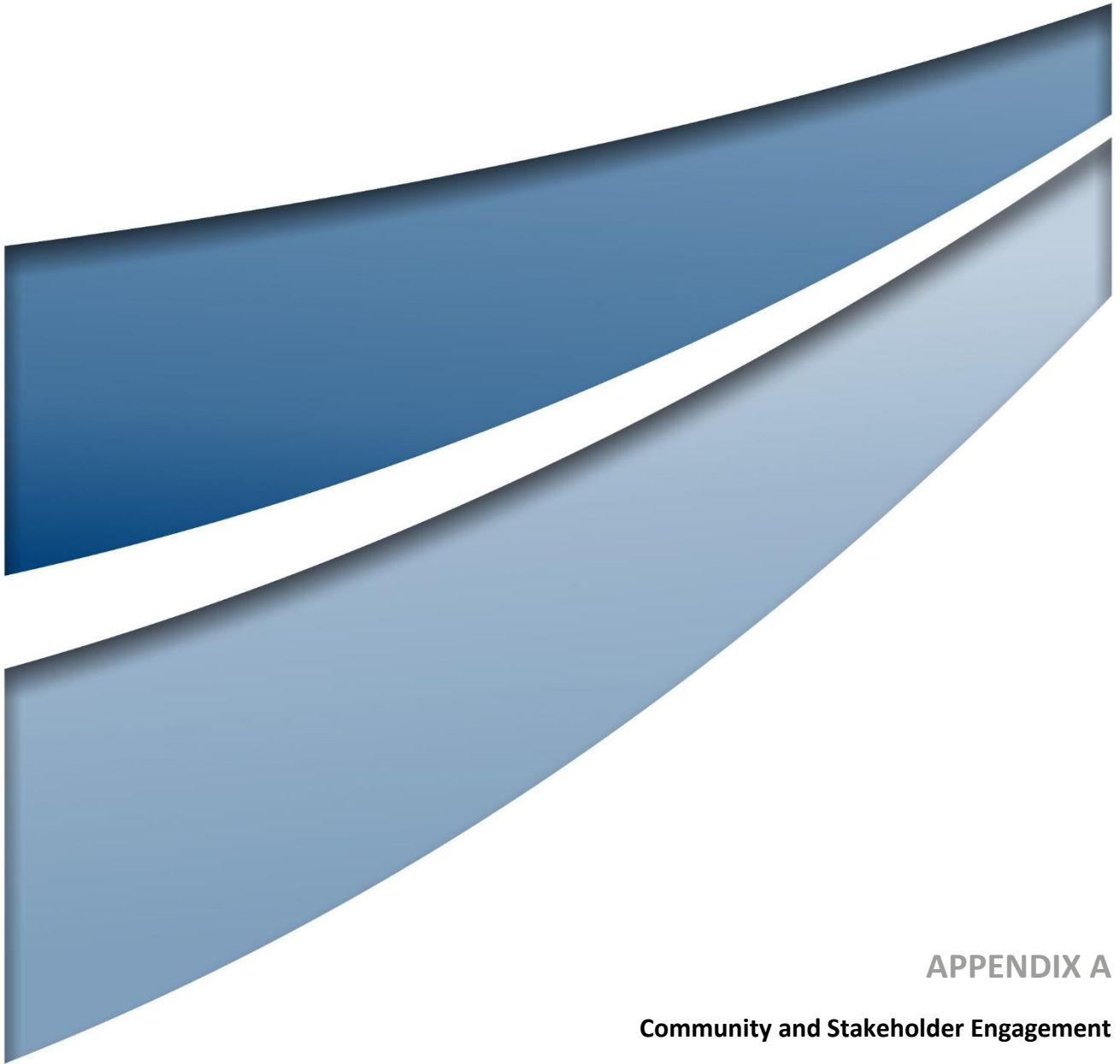
Tourism Victoria 2015. Guidelines for Trail Planning, Design and Management.
https://www.mtba.org.au/wp-content/uploads/guidelines_for_trail_planning_design_and_management_280515.pdf

Umwelt (Australia) Pty Limited (2021a) Munibung Hill Site Context, Values and Constraints. Review and analysis to inform the development of a management plan. For Lake Macquarie City Council, June 2021.

Umwelt (Australia) Pty Limited (2021b). Munibung Hill Community and Stakeholder Engagement Report. For Lake Macquarie City Council, June 2021

Umwelt (Australia) Pty Limited (2021c) Munibung Hill Options Analysis. Review and analysis to inform the development of a Munibung Hill Management Plan. For Lake Macquarie City Council, June 2021.

Umwelt (Australia) Pty Limited (2021d) Munibung Hill Concept Plan. Concept Plan to inform the Munibung Hill Management Plan. For Lake Macquarie City Council, August 2021.



APPENDIX A

Community and Stakeholder Engagement

Community Engagement Results

Table A1.1 provides a summary of the key findings from general community engagement (for more detail, see Umwelt 2021d).

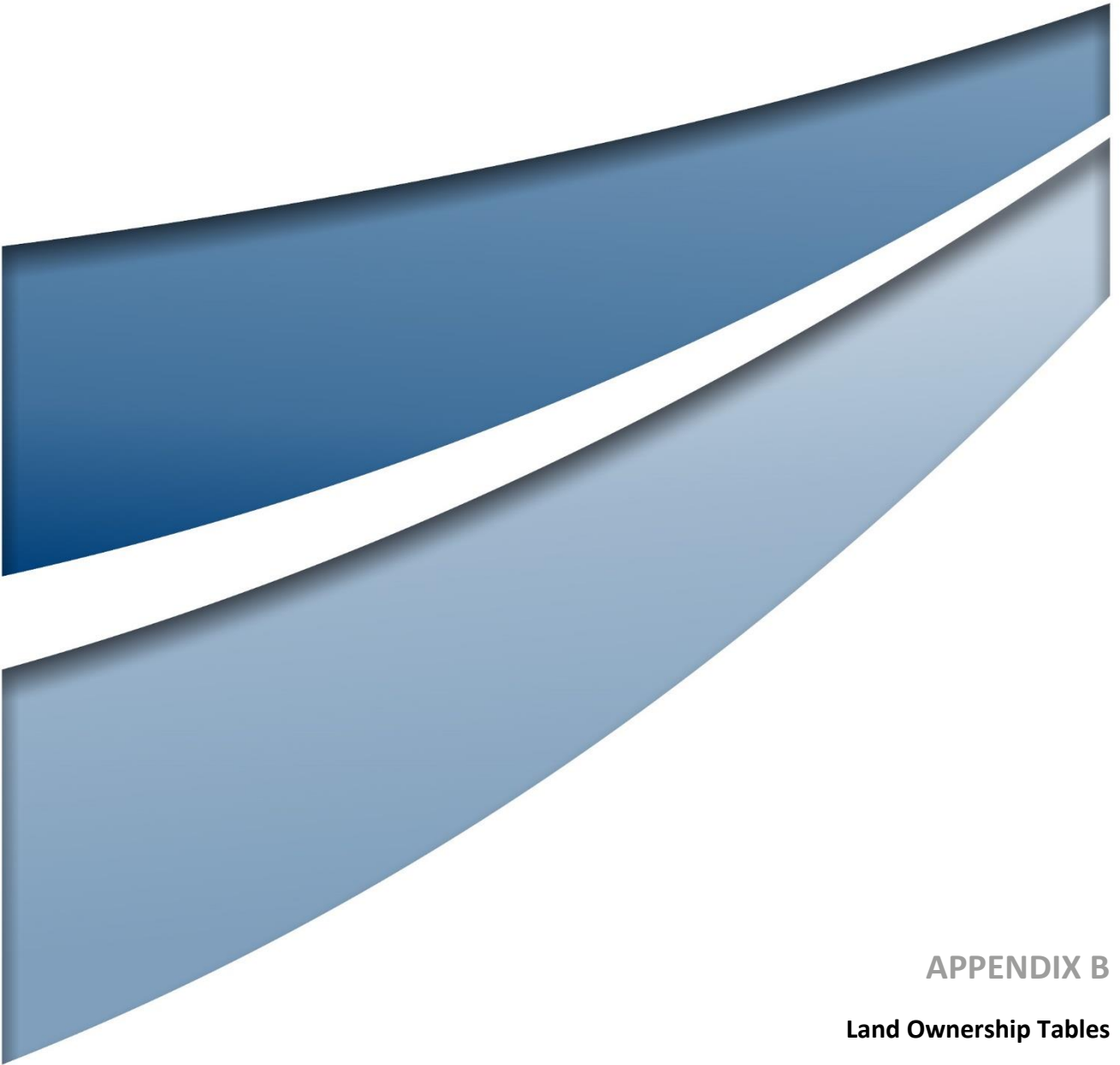
Table A1.1 Community Engagement Results

Topic	Response
Values of the Munibung Precinct	<p>Munibung Hill's natural environment is the most valued due to its relatively untouched nature.</p> <p>The lack of residential development is highly valued to the community to connect to nature in a serene and peaceful environment surrounded by unique native flora and fauna.</p> <p>The expansive view of Lake Macquarie from Munibung Hill is the second most valued aspect.</p> <p>Respondents enjoyed the opportunity to experience these views by participating in recreational activities such as bushwalking in proximity to local facilities.</p>
Access and Activities	<p>88% of respondents have visited Munibung Hill.</p> <p>The majority of people access Munibung Hill from Lucilla Ridge Macquarie Hills.</p> <p>The quality of the walking tracks is described as 'poor' and 'dangerous' which has prevented local residents to visiting the Hill due to safety concerns.</p>
Land Management	<p>Many visitors of Munibung Hill and local residents and landholders are unsatisfied with the current management of the area.</p> <p>Respondents suggested that the walking tracks need to be revitalised by further management of weed overgrowth.</p> <p>Much of the current access to the Hill is currently illegal and stakeholders have requested clearly defined legal tracks.</p> <p>Erosion management to curb the degradation of the tracks was suggested by respondents to prevent further damage to the poor-quality tracks.</p> <p>Other management opportunities suggested includes sign posting and increased monitoring and policing of illegal access by motorbike and four-wheeled drives.</p>
Future Uses	<p>The majority of stakeholders 'strongly agreed' that Munibung Hill Precinct should be developed for recreation use.</p> <p>More car parking was supported but local residents from Lucilla Ridge and Macquarie Hills, stated that they would not accept any parking facilities in their neighbourhood.</p> <p>Stakeholders proposed access from the Boolaroo estates.</p> <p>Future uses for four-wheel driving, motorbike riding, and 'adventure sports' were not supported.</p> <p>Stakeholders were supportive of using Munibung Hill for down-hill mountain bike riding.</p> <p>A lookout platform or viewing deck was the most widely requested followed by clearly formed walking trails to improve safety and accessibility</p>
Future Stakeholder Engagement	<p>A large majority of stakeholders have expressed an interest in being updated on further developments of the Management Plan.</p>

Stakeholders were asked to share their perceived positive and negative impacts of facilitating further access to Munibung Hill. The answers are provided in **Table A1.2** below.

Table A1.2 Stakeholder's Perceived Positive and Negative Impacts

Perceived Positive Impacts	Perceived Negative Impacts
<ul style="list-style-type: none"> • increased recreation and fitness opportunities • conservation and environmental protection • improved mental health and wellbeing • enhanced connection to nature • opportunities for education • improved awareness of the historical and Indigenous heritage • more visibility creating a sense of community surveillance could discourage illegal activity at the area • greater connectivity between local suburbs • increasing tourism opportunities and employment and business development opportunities • increase in property values in the area 	<ul style="list-style-type: none"> • impacts on wildlife and natural habitats and further erosion • increase in traffic at access points and parking issues in residential streets • urban development encroaching on the Hill and further exacerbating environmental damage • further pollution e.g., illegal dumping and littering by visitors • perceived increased to bushfire risk • allowing motorbikes and four-wheel drive vehicles access to the Hill could impact the ambience of the area and the social amenity of nearby residents, due to noise and result in safety concerns for pedestrians • increase in antisocial behaviours, with vandalism, large gatherings or parties and potential drug and alcohol consumption occurring at the site.



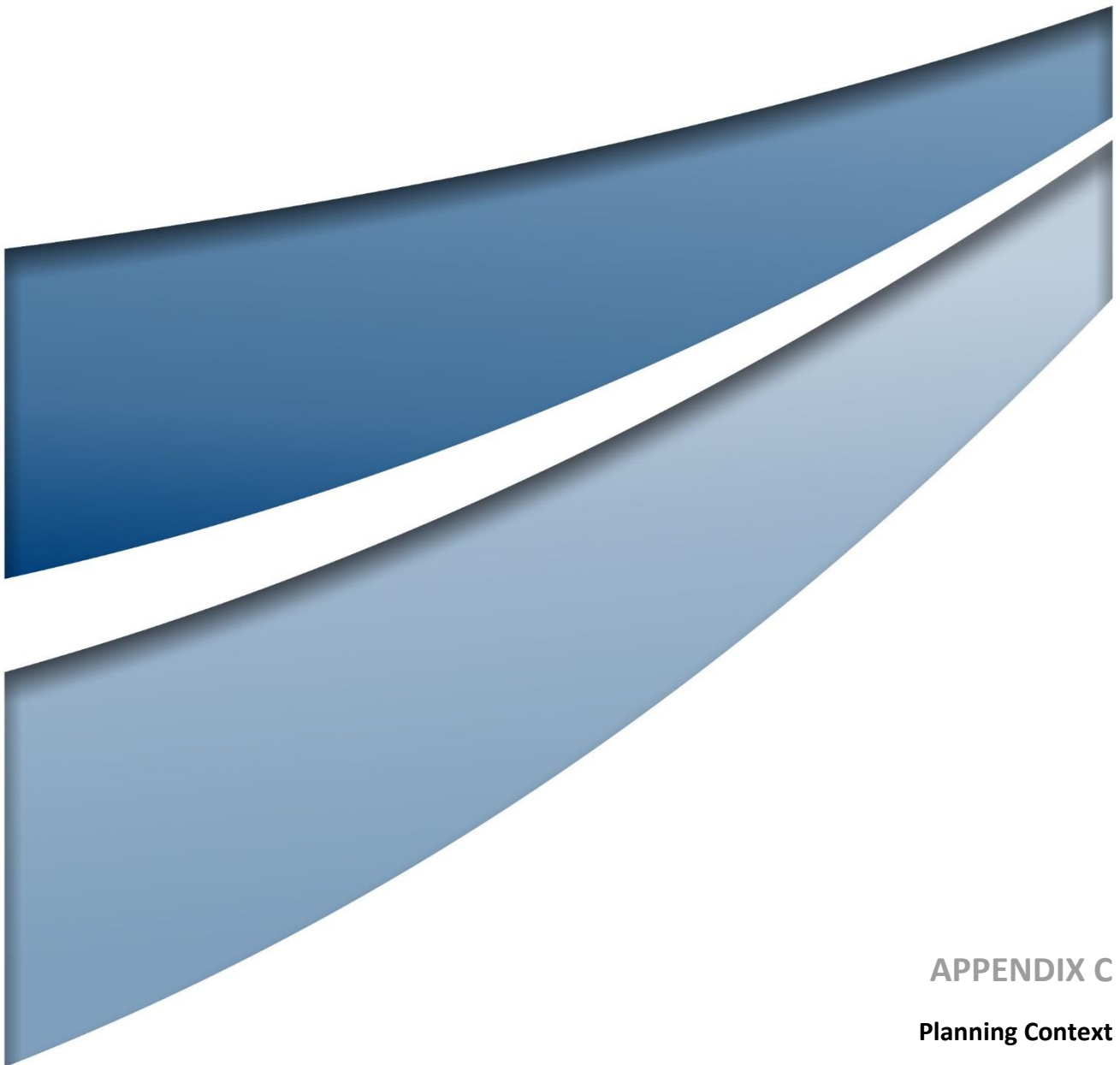
APPENDIX B

Land Ownership Tables

Table B1.1 Land Ownership for the Management Plan

Address	Lot	DP	Owner	Management Plan
Boolaroo				
27 Blantyre Road, Boolaroo	1010	1270101	LMCC	Further Investigation Area
38 Blantyre Road, Boolaroo	1009	1270101	Green Capital Group	Excluded
1 Cressy Road, Boolaroo	1011	1270101	Costco	Excluded
10 Edge Street, Boolaroo	1004	1270101	WAMC	Further Investigation Area
2A Fourth Street, Boolaroo	51	1229360	WAMC	Further Investigation Area
2B Main Road, Boolaroo	1001	1270101	LMCC	Excluded
2C Main Road, Boolaroo	1002	1270101	WAMC	Excluded
128 Munibung Road, Boolaroo	1006	1270101	Green Capital Group	Partly included. E2 zoned land identified in Further Investigation Area
140 Munibung Road, Boolaroo	1005	1270101	WAMC	Excluded
144 Munibung Road, Boolaroo	1012	1270101	Part HCCDC and Part LMCC	Excluded
160 Munibung Road, Boolaroo	1008	1270101	HCCDC	Excluded
1A Sixth Street, Boolaroo	1	105845	Munibung Hill Pty Ltd	Management Plan Area
1A Sixth Street, Boolaroo	2	105845	Munibung Hill Pty Ltd	Management Plan Area
1A Sixth Street, Boolaroo	1	210440	Munibung Hill Pty Ltd	Management Plan Area
1A Sixth Street, Boolaroo	1	321254	Munibung Hill Pty Ltd	Management Plan Area
Macquarie Hills				
39 Delaware Drive, Macquarie Hills	146	846847	LMCC (Public Reserve)	Management Plan Area
41 Delaware Drive, Macquarie Hills	2	1119917	LMCC	Management Plan Area
81C Delaware Drive, Macquarie Hills	366	1101219	LMCC (Public Reserve)	Management Plan Area
17A Gelfius Crescent, Macquarie Hills	1	1111569	Private owner	Management Plan Area
9 Kuraman Close, Macquarie Hills	411	1213894	Private owner	Excluded
65A Lawson Road, Macquarie Hills	31	879072	LMCC	Management Plan Area
18 Lucilla Ridge, Macquarie Hills	327	1162784	Private owner	Partly included. E2 zoned land identified in Further Investigation Area
20 Lucilla Ridge, Macquarie Hills	326	1162784	Private owner	Partly included. E2 zoned land identified in Further Investigation Area
22 Lucilla Ridge, Macquarie Hills	325	1162784	Private owner	Partly included. E2 zoned land identified in Further Investigation Area
24 Lucilla Ridge, Macquarie Hills	324	1162784	Private owner	Partly included. E2 zoned land identified in Further Investigation Area

Address	Lot	DP	Owner	Management Plan
25C Lucilla Ridge, Macquarie Hills	330	1162784	LMCC (Public Reserve)	Management Plan Area
26 Lucilla Ridge, Macquarie Hills	323	1162784	Private owner	Partly included. E2 zoned land identified in Further Investigation Area
28 Lucilla Ridge, Macquarie Hills	322	1162784	Private owner	Partly included. E2 zoned land identified in Further Investigation Area
Speers Point				
3A Council Street, Speers Point	1	557315	Munibung Hill Pty Ltd	Excluded
26A Farm Street, Speers Point	39	239504	LMCC	Management Plan Area
26A Farm Street, Speers Point	5	250910	LMCC	Management Plan Area
6 Hopkins Street, Speers Point	42	610712	Private owner	Excluded
10A Hopkins Street, Speers Point	21	804331	LMCC	Management Plan Area
1A Quarry Road, Speers Point	1	335551	LMCC	Management Plan Area
23 Rani Close, Speers Point	28	1120431	Private owner	Management Plan Area
1A Raymond Street, Speers Point	21	790637	Munibung Hill Pty Ltd	Management Plan Area
41A Thompson Road, Speers Point	22	771139	LMCC	Management Plan Area
43 Thompson Road, Speers Point	1	335312	Private owner	Partly included. E2 zoned land identified in Further Investigation Area
47B Thompson Road, Speers Point	33	804655	LMCC	Management Plan Area
69 Thompson Road, Speers Point	27	238538	Private owner	Excluded
71C Thompson Road, Speers Point	29	238538	LMCC (Public Reserve)	Management Plan Area
Warners Bay				
19 Daydawn Avenue, Warners Bay	100	1173625	Private owner	Management Plan Area
135 Fairfax Road, Warners Bay	21	1015155	Delance Pty Ltd	Management Plan Area
149 Fairfax Road, Warners Bay	4	818323	LMCC	Management Plan Area
151 Fairfax Road, Warners Bay	29	242069	LMCC	Management Plan Area
151 Fairfax Road, Warners Bay	36	252309	LMCC	Management Plan Area
151 Fairfax Road, Warners Bay	8	259023	LMCC	Management Plan Area
151 Fairfax Road, Warners Bay	188	264294	LMCC	Management Plan Area
151 Fairfax Road, Warners Bay	52	566559	LMCC	Management Plan Area
171 Macquarie Road, Warners Bay	672	805546	LMCC	Management Plan Area
179 Macquarie Road, Warners Bay	5410	807486	LMCC	Management Plan Area



APPENDIX C

Planning Context

Planning Context

State Government Legislation and Policy

Table C1.1 summarises the NSW Government legislation and policies which guide the strategic planning of the Lake Macquarie LGA and Munibung Hill.

Table C1 State statutory context and planning policies

Legislation/Policy	Relevance to Munibung Hill Management
<i>Environmental Planning and Assessment Act 1979</i> (EP&A Act)	The EP&A Act and the associated Environmental Planning and Assessment Regulation 2000 (the Regulation) provide the framework for assessing the potential environmental impacts associated with proposed activities and developments in NSW. Upgrades of tracks and trailheads will require design and an assessment of environmental impact as well as approval under the EP&A Act.
<i>Protection of the Environment Operation Act</i> (POEO Act) and <i>Contaminated Land Management Act 1997</i>	<p>The EPA uses its powers under the <i>Contaminated Land Management Act 1997</i> to deal with significant contamination. Other authorities, including councils deal with contamination under the planning and development process, including state Environmental Planning Policy 55 (remediation of Land) and the Managing Land Contamination Guidelines, to determine what remediation is needed.</p> <p>LMCC applies a six-level contamination notation system:</p> <ul style="list-style-type: none"> • Notation 1 – contaminated land • Notation 2 – potentially contaminated land • Notation 3 – remediated and above the contaminated land investigation threshold levels • Notation 4 – remediated and below the contaminated land investigation threshold levels • Notation 5 – tested and below contaminated land investigation threshold levels • Notation 6 – Contamination of remediation status unknown. No clear site history. <p>Much of the upper slope and ridge crest terrain that is included in the Management Area is included in Notation 6. Detailed studies of contamination have not been completed in this area. Potential contaminants in the Management Area include lead, zinc and cadmium. Additional contaminants were present in the PCCS site, which has now been remediated.</p>
<i>State Environmental Planning Policy</i> (Coastal Management) 2018	<p>The Coastal Management SEPP implements the objectives of the <i>Coastal Management Act 2016</i> (CM Act) from a land use planning perspective, by specifying how development proposals are to be assessed if they fall within the coastal zone.</p> <p>The north-west corner and southern tip of Munibung Hill precinct both fall within the land application area for the Coastal Management SEPP.</p> <p>The Concept Plan for Munibung Hill is consistent with the objectives and controls of the Coastal Management SEPP.</p>

Legislation/Policy	Relevance to Munibung Hill Management
<p><i>National Parks and Wildlife Act 1974</i> (NPW Act)</p>	<p>The NPW Act aims to conserve nature, objects, places or features of cultural value within the landscape. The NPW Act is the primary piece of legislation for the protection of Aboriginal cultural heritage in NSW. Any development or activities proposed on Munibung Hill will be subject to Clause 89 and 90 of the NPW Act which protects all Aboriginal cultural Objects (archaeological evidence).</p> <p>Munibung Hill has been nominated for gazettal as an Aboriginal Place. A determination of this nomination will take some time. The existence of the nomination reinforces the cultural value of the place and highlights the importance of engaging with Awabakal knowledge holders about proposed works and activities on Munibung Hill.</p> <p>As noted in Section 3.4, Munibung Hill and its ridgelines and slopes are recognised as a Sensitive Aboriginal Cultural Landscape in the LMCC LEP. The LEP requires consultation with Aboriginal community members and Awabakal knowledge holders about any proposed development or management of Munibung Hill, to ensure that cultural values are appropriately recognised, protected and interpreted.</p> <p>Members of the local Aboriginal community have been consulted in the process of development of the Concept Plan and Management Plan. Actions in the Management Plan look to avoid impacts on known sites, and sensitive areas identified by the Aboriginal community. Engagement with the Aboriginal community will continue during implementation of the Munibung Hill Management Plan.</p>
<p><i>Coal Mine Subsidence Compensation Act 2017</i> (CMSC Act)</p>	<p>The CMSC Act replaced the former <i>Mine Subsidence Compensation Act 1961</i> and provides a process for assessment of whether a property complies with Subsidence Advisory NSW's development requirements.</p> <p>The north of Munibung Hill and the previous PCCS site are included in a mapped mine subsidence district. Subdivision and certain development (erection or alteration of an improvement) within this district would require approval under Part 3 of the CMS Act. The mine subsidence district is outside the area covered by the Management Plan area and Concept Plan and therefore it is unlikely that mine subsidence requirements will apply to works. However, it is noted that infrastructure defined in the CMS Act includes public parks or reserves management, soil conservation works or other buildings.</p> <p>The Concept Plan does not include any development in these areas and the CMS Act does not apply to the current Management Plan.</p>
<p><i>Rural Fires Act 1997</i> (RF Act)</p>	<p>The RF Act established the Rural Fire Service as well as legal structures for the prevention, mitigation, and suppression of rural fires, including obligations on land owners.</p> <p>Munibung Hill is surrounded by urban development, including residential areas which require careful control of any prescribed fire to prevent impacts on life and property. The urban interface surrounding Munibung Hill is included in the current Central Coast Bush Fire Risk Management Plan 2020 to 2025. This plan applies to all land-owners in the urban interface area.</p> <p>The Munibung Hill Management Plan recognises existing and ongoing commitments of the land-owners and the need to minimise the danger of the spread of bushfire.</p>

Legislation/Policy	Relevance to Munibung Hill Management
<i>Local Government Act 1993 (LG Act)</i>	<p>The LG Act provides the framework for the system of local government and sets out the responsibilities and powers of councils. It provides a system that is accountable to the community. This Act only applies directly to the Council owned land in Munibung Hill.</p> <p>LMCC has prepared a Plan of Management for Community Land (LMCC, 2011) required under Part 2 of the LG Act. This plan is currently the only plan guiding Council's management of Community Land on Munibung Hill. The existing Plan of Management sets out management guidelines for areas of known Aboriginal significance and states that no work unless for maintenance purposes, shall take place on those areas (LMCC 2011, Section 2.4 of Part A of the Plan of Management).</p> <p>The Plan of Management also categorises Community Land on Munibung Hill as 'Natural Area - Bushland' and sets out the core objectives of land categorised as Natural Area – Bushland under Section 36(5) of the LG Act. (see Section 3.2)</p> <p>The Munibung Hill Management Plan is consistent with the requirements set out under the LG Act and the Plan of Management of Community Land in place by the LMCC.</p>
<i>Biodiversity Conservation Act 2016 (BC Act)</i>	<p>The Permian Gully Rainforest (MU 1g) mapped in the south-west of the Study Area by Bell (2019) may conform to <i>Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions Endangered Ecological Community</i> (EEC) as listed under the BC Act. The literature review identified that EPS (2017a) described small patches of rainforest vegetation in the Munibung Pty Ltd landholding as conforming to the Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions EEC.</p> <p>Thirteen threatened species, listed in the Biodiversity Conservation Act, have been recorded in the Munibung Hill area. Some of these species are also listed in the <i>Environment Protection and Biodiversity Conservation Act</i> (EPBC Act) as nationally vulnerable or critically endangered.</p> <p>The Munibung Hill Management Plan aims to avoid impacts, maintain and improve habitat values for threatened species and communities listed under the BC Act.</p>
<i>Biosecurity Act 2015</i>	<p>The Biosecurity Act provides a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matters. Priority weeds and pest species known or predicted to occur on Munibung Hill are listed in Appendix D.</p>
<i>NSW Invasive Species Plan (2018) and NSW Biosecurity Strategy</i>	<p>These plans identify how the NSW Government plans to prevent new invasive species incursions, eliminate or contain existing populations and manage other widespread invasive species, including weeds and feral animals.</p> <p>In Lake Macquarie, council works with State agencies to manage pest animal and plant species, including declared priority weeds and environmental weeds. Council also works with Landcare and community to manage weeds on public reserves.</p> <p>Invasive plants and animals, including weed species of national significance and pest animal species such as fox and feral cat, are present on Munibung Hill.</p>

Regional Plans

Regional planning for population growth, new urban areas and supporting infrastructure is set out in the Hunter Regional Plan and the Greater Newcastle Metropolitan Plan. Relevant strategic directions from these plans are summarised in **Table C1.2**.

Table C1.2 Regional Plans and State-Wide Policy Direction

Regional Plan	Relevance to Munibung Hill Management
Greater Newcastle Metropolitan Plan 2036	<p>Greater Newcastle Metropolitan Plan 2036 (DPIE 2018) sets our strategies and actions that drive sustainable growth across the Greater Newcastle area being Cessnock City, Lake Macquarie City, Maitland City, Newcastle City and Port Stephens.</p> <p>Munibung Hill Precinct is within the Metro Core area extending from the ocean to the northern shores of Lake Macquarie, including Lake Macquarie North West Growth Area, and to the north-west to Hexham. This area supports nearly two thirds of Greater Newcastle's homes and jobs. It recognises the need for more transport options, including cycle paths, to connect centres.</p> <p>The Munibung Hill Management Plan provides for passive recreational trails for the next 10 years Options for cycling and additional passive recreational trails with new homes in the Boolaroo and North West Growth Area would continue to be investigated by Council with landholders/developers.</p>
Hunter Regional Plan 2036	<p>The Hunter Regional Plan 2036 provides an overarching framework for the land use planning priorities and decisions for the Hunter Region to 2036.</p> <p>Priorities for each Local Government Area are identified in the Hunter Regional Plan. For the suburbs around Munibung Hill, the priorities include the regionally significant strategic centre of Cardiff-Glendale including redevelopment of the former industrial lands at Boolaroo (Pasminco and Incitec sites) and the delivery of urban infill opportunities on the former industrial lands (NSW Planning and Environment 2016). These priorities all contribute to a potential growth in demand for natural open space and associated active and passive recreational opportunities.</p> <p>The Munibung Hill Management Plan provides for conservation of the natural open space and passive recreation of a significant portion of Munibung Hill over the next 10 years. The options for expansion of the management area and expansion of active and passive recreational opportunities would continue to be investigated by Council with landholders/developers.</p>
Greener Places: An urban Green Infrastructure Design Framework for NSW 2020	<p>The design guide provides advice on public open space for recreation: green infrastructure for people; urban tree canopy – green infrastructure for adaptation and resilience; and bushland and waterways: green infrastructure for habitat and ecological health.</p> <p>This third element of the Design Guide is particularly relevant to Munibung Hill. it provides a framework for improving connectivity between bushland and waterways, connecting people to nature within a sustainable environment.</p> <p>The Munibung Hill Management Plan primary objective is conservation and improving the bushland values and connectivity. Connecting people to nature would be promoted through improvements in some of the existing walking trails.</p>
Designing with Country, Connecting with Country Draft Framework and Discussion Paper 2019	<p>This framework and guidance is relevant to all government projects and public land. The NSW Government has committed to helping t support the health and wellbeing of Country by valuing, respecting and being guided by Aboriginal people who know that if we care for Country, it will care for us.</p> <p>The concepts and processes outlined in the draft Framework and Discussion Paper are important to the management of public open space on Munibung Hill, which is recognised as a place of significance to Awabakal people and an important part of the cultural landscape of the city.</p>

Local Planning Context

Lake Macquarie Local Strategic Planning Statement (LSPS) 2020

Council prepared its 'Imagine Lake Mac' strategy in 2018. The Strategy is the link between the Community Strategic Plan (CSP) and the Local Strategic Planning Statement (LSPS) 2020.

The CSP and Imagine Lake Mac identify a city vision, key themes, important changes and how they will be achieved. The themes and changes included the need to maintain and improve scenic amenity, the ridgeline native vegetation corridor of Munibung Hill and the need to facilitate appropriate access. These were brought forward into the LSPS.

The LSPS identifies the North West Growth Area as a key area of change and development for the City. The area incorporates land between Speers Point, Edgeworth, and Cardiff and includes Munibung Hill and its surrounding former industrial and quarry lands.

The North West Growth Area has potential to be a strategic gateway to Greater Newcastle and provide potential opportunities for retail, advanced manufacturing, office-based jobs, and an urban renewal precinct. Importantly for the Management Plan this includes the former Pasminco site and former Hawkins Quarry site which are both currently being developed as residential and/or commercial estates.

The North West Growth Area also identifies a ridgeline native vegetation corridor on Munibung Hill, which is proposed to improve scenic amenity alongside facilitated access for recreation. It also acknowledges the Aboriginal cultural heritage value of Munibung Hill and the importance of involving the local Aboriginal community in planning and decision making.

Table C1.3 summarises the strategic planning priority actions set out by the Strategic Planning Statement that have been considered in developing the Munibung Hill Management Plan.

Table C1.3 LSPS Strategic Planning Priority Actions

Action	Description and Relevance to Munibung Hill Management Plan
3.2.1	<p>Review the planning controls for the former Pasminco site to ensure transformational investment and development opportunities are realised, and to manage potential land use conflict and transition between zones.</p> <p>This action is being progressed by landholders of the former Pasminco site and through the current review of the Pasminco Area Plan DCP 12.15, however there is a need to ensure transition between the Pasminco site development and any proposed developments and management in the adjacent Munibung Hill lands.</p> <p>Options for further expansion of the Management Plan to include those conservation zoned land identified as 'further investigation areas' and to recognise passive recreational opportunities from residential land currently being developed in the former Pasminco site, would be investigated by Council with landholders/developers.</p>
5.5	<p>Continue to work with local Aboriginal communities and knowledge holders to develop nominations for sites of special significance to Aboriginal people for Aboriginal Place listing and/or State or local heritage listing.</p> <p>The Constraints Report (Umwelt 2020a) discusses the cultural values and the involvement of Aboriginal community representatives in the development of the Concept Plan and Management Plan for Munibung Hill.</p>

Action	Description and Relevance to Munibung Hill Management Plan
5.11	<p>Prepare a Trails Strategy, incorporating walking and mountain bike trails in the city, to provide improved connection with the existing and planned footpath and cycling networks.</p> <p>If prepared, the Trails Strategy would outline an approach to recreational trails across the whole City. It will connect with council's recently adopted Walking, Cycling and Better Streets Strategy, which also shows active transport routes across the city.</p> <p>Connections from the proposed tracks on Munibung Hill to the broader active transport framework are considered in the Concept Plan and Management Plan. The potential opportunities provided by the tracks on Munibung Hill within a future City-wide trails Strategy are discussed in the Context, Values and Constraints Report (Umwelt 2020a)</p> <p>Because of current uncertainties about important constraints to recreational use on Munibung hill, the Concept Plan is limited to upgrading of selected existing trails to provide for passive recreation.</p>
6.3	<p>Work with State Government and other councils to enhance Greater Newcastle's Blue and Green Grid.</p> <p>Munibung Hill is part of the blue and green grid with natural area connection mainly to the east. Cockle Creek flows to west of Munibung Hill but there are limited opportunities to link the vegetated ridge crest to the riparian corridor. Actions in the Management Plan will help to reduce threats to water quality and habitat in Cockle Creek and the northern shoreline of Lake Macquarie.</p>
6.4	<p>Implement policy and practices that minimise the rezoning of land identified to contain 'high ecological value' vegetation.</p> <p>The concept plan does not include any rezoning and existing high ecological value vegetation is included within the Concept Plan except for <i>Angophora inopina</i> reserve. This reserve and other lands owned by WAMC are identified as further investigation areas with the long-term aim of including these in future management plans of Munibung Hill.</p>
6.5	<p>Prepare, review, and implement guidelines (and associated planning controls) to ensure that biodiversity, and ecological connectivity are adequately assessed, and impacts avoided and/or mitigated within the context of new legislation.</p> <p>Considered in the development of the Management Plan.</p>
6.8	<p>Review and revise the Lake Macquarie Heritage Strategy to ensure it continues to support the identification, conservation, protection, management and interpretation of important Aboriginal and European heritage places and landscapes.</p> <p>The development of the Management Plan for Munibung Hill highlights issues that will be part of the review of the Heritage Strategy, including the mapping of Sensitive Aboriginal Cultural Landscapes, appropriate engagement of Aboriginal community representatives in strategic planning and landscape design and identifying recreational access management and uses for culturally sensitive areas.</p>
7.5	<p>Prepare a Green Infrastructure Strategy, to identify opportunities to enhance connections between recreational open space, bushland, the lake and other waterways, and urban tree canopy, including establishing baseline data to determine current status of houses within a 10-minute walk of open space.</p> <p>Providing access to green or natural open space for local communities and at the District level is a key driver for the development of the Concept Plan and Management Plan for Munibung Hill.</p>

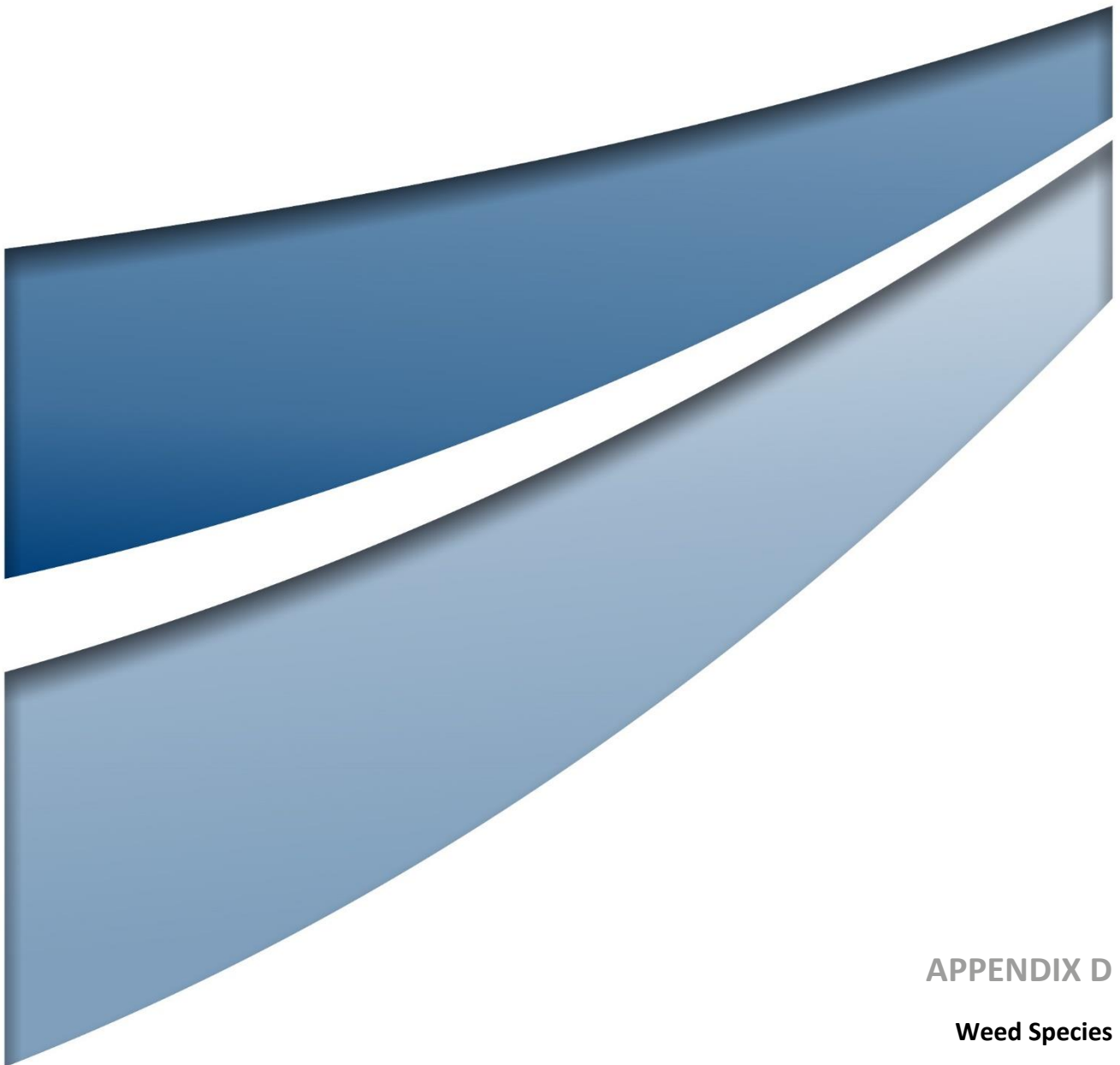
Other Local Strategic Plans

Other local strategic plans are summarised below in **Table C1.4**. These plans identify the zoning, appropriate land uses and development controls for Munibung Hill, as well as identifying the role of the open space on Munibung Hill in the city's approach to biodiversity, cultural heritage and community well-being.

Table C1.4 Local and Regional Strategic Plans

Plan/Policy	Description and Relevance to Munibung Hill Management Plan
Lake Macquarie Local Environmental Plan 2014	<p>The Lake Macquarie Local Environmental Plan 2014 (LEP) applies to the Munibung Hill. Under the LEP, Munibung Hill is predominantly zoned as E2 Environmental Conservation land. Recreational areas, environmental facilities and eco-tourist facilities are permitted with consent in the E2 zone.</p> <p>Clause 7.13 of the LEP seeks to ensure redevelopment of the former PCCS and Incitec Pivot sites at Boolaroo is conducted in accordance with sound planning principles recognising the constraints of these sites and the requirement for integration with adjoining urban areas. Legacy contamination from the former operations of these industries is a key unresolved constraint to recreational access to parts of Munibung Hill – those areas now managed by WAMC.</p>
Lake Macquarie Development Control Plan 2014	<p>The Lake Macquarie Development Control Plan 2014 (LMDCP) provides guidance on Council's requirements for development applications.</p> <p>The DCP Area Plans have been considered in development of the Concept Plan. DCP Area Plan 12.18 Munibung Hill Speers Point Quarry applies to a large parcel of land in the south of the Concept Plan area (1A Raymond Street, Speers Point) owned by Munibung Hill Pty Limited. This area has an approved Vegetation Management Plan (VMP) (ESP 2017). The Management Plan considers the objectives and actions of the existing VMP (ESP 2017).</p>
Lake Macquarie City Community Strategic Plan	<p>The Community Strategic Plan is Council's overarching 10 year vision and priorities for the City and is a requirement of the IP&R framework. In preparing the CSP, Council worked with a representative community panel which identified 7 key focus areas. The following apply to Munibung Hill and the Management Plan:</p> <ul style="list-style-type: none"> • Our unique landscape where natural environment is protected and enhanced where our existing urban centres are the focus of our growth. • Lifestyle and wellbeing – encouraging safe, active and social opportunities. This includes having recreational facilities and public space available to meet community needs. • Shared decision making with partnerships to benefit our City, engagement with the community and key stakeholders.
LMCC Development Contributions Plan Glendale Contributions Catchment 2015	<p>The LMCC Development Contributions Plan Glendale Contributions Catchment 2015 recommends that a network of tracks and trails are provided over Munibung Hill through the establishment of easements, where required, to provide legal public access and to upgrade part of those tracks and trails.</p> <p>The Management Plan includes upgrade of some of the trails identified in the Glendale Contributions Plan.</p>
Walking, Cycling and Better Streets Strategy 2031	<p>The draft Walking, Cycling and Better Streets Strategy 2031 aims to help deliver new pedestrian, cycling and road safety improvements across Lake Macquarie.</p> <p>The draft Strategy shows the Speers Point to Glendale connection and also potential paths onto Munibung Hill, which contribute to active transport connectivity from Speers Point and Warners Bay to Cardiff, Glendale and the North West Growth Area.</p> <p>The previous City Cycling Strategy 2021 projected increased cycling as a form of active transport and noted the potential opportunity to connect off road recreational trails on Munibung to the active transport network.</p> <p>The Management Plan includes promotion of passive recreation.</p>

Plan/Policy	Description and Relevance to Munibung Hill Management Plan
Parks and Play Strategy 2021	<p>The strategy provides a definition and purpose of parks – places where residents and visitors can relax, be physically active and play. They are free publicly accessible locations, where people can escape the built environment, enjoy local amenity as well as providing habitat for wildlife and improving air quality and temperature control in urban areas. Munibung Hill is not classified as a Park in the strategy, which focuses on more formal spaces, rather than bushland and nature reserves. However, there are clear links between the recreational opportunities in ‘natural urban parks and those in a bushland reserve.</p>
Plan of Management for Community Land 2021	<p>LMCC Plan of Management for Community Land 2011 applies to the majority of LMCC owned community land on Munibung Hill and is currently the only plan guiding LMCC’s management of this land.</p> <p>Under this plan Munibung Hill is classified as ‘Natural Area - Bushland’. Appendices 6 and 7 of the Plan of Management list various activities/facilities that may be permitted with or without approval, and activities/facilities that are prohibited on community land categorised as natural bushland.</p>



APPENDIX D

Weed Species

Common Name	Scientific Name	High threat weed (BC Act)	Priority weed (Biosecurity Act)	Weed of National Significance
Crofton Weed	Ageratina adenophora	ü	-	-
Whiskey grass	Andropogon virginicus	ü	-	-
Climbing Asparagus Fern	Asparagus plumosus	ü	ü	ü
Cobblers pegs	Bidens pilosa	ü	-	-
Common centaury	Centaureum erythraea	-	-	-
Mouse-ear chickweed	Cerastium glomeratum	-	-	-
Rhodes Grass	Chloris gayana	ü	-	-
Camphor laurel	Cinnamomum camphora	-	-	-
Spear thistle	Cirsium vulgare	-	-	-
Flax-leaf Fleabane	Conyza bonariensis	-	-	-
Tall Fleabane	Conyza sumatrensis	-	-	-
Pampas Grass	Cortaderia selloana	ü	ü	-
Panic Veldt Grass	Ehrharta erecta	ü	-	-
African lovegrass	Eragrostis curvula	ü	-	-
Coral tree	Erythrina sykesii	-	-	-
Coolatai grass	Hyparrhenia hirta	ü	ü	-
Flatweed	Hypochaeris radicata	-	-	-
Morning Glory	Ipomoea indica	ü	-	-
Lantana	Lantana camara	ü	ü	ü
Large-leaved privet	Ligustrum lucidum	ü	-	-
Small-leaved Privet	Ligustrum sinense	ü	-	-
Red Natal grass	Melinis repens	-	-	-
Banana	Musa acuminata	-	-	-
Fish-bone fern	Nephrolepis cordifolia	-	-	-
Paspalum	Paspalum dilatatum	ü	-	-
Kikuyu	Pennisetum clandestinum	ü	-	-
Castor Oil Plant	Ricinus communis	-	-	-
Blackberry	Rubus fruticosus	ü	ü	ü
Blackberry	Rubus ulmifolius	ü	ü	ü
Fireweed	Senecio madagascariensis	ü	ü	ü
Paddy's lucerne	Sida rhombifolia	-	-	-
Black nightshade	Solanum nigrum	-	-	-
Common Sow-thistle	Sonchus oleraceus	-	-	-
Stinking Roger	Tagetes minuta	-	-	-
Wandering jew	Tradescantia fluminensis	-	-	-
Purpletop	Verbena bonariensis	-	-	-
Veined verbena	Verbena rigida	-	-	-

