



NSW NATIONAL PARKS & WILDLIFE SERVICE

Glenrock State Conservation Area

Draft Mountain Biking Plan



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Cover photo: Mountain bike riding in Glenrock State Conservation Area, John Spencer/DPE

This document is a draft for public comment. The provisions in the final plan may differ from the provisions of this draft document.

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Contents

Have your say	vi
What happens to your feedback?	vi
Your privacy	vi
How to use this plan	vii
Acknowledgements	vii
Contact us	vii
Summary	viii
1. Background and context	1
1.1 Park values	1
1.2 Cycling and mountain biking in Glenrock SCA	2
1.3 Strategic framework for the mountain biking plan	4
1.4 Park zoning	5
2. The proposed network	9
2.1 Northern Loop section	13
2.2 Middle Loop section	14
2.3 Southern Loop section	16
2.4 Brunner Loop section	18
2.5 Skills areas	19
3. Implementing the network	21
3.1 Track design, construction and difficulty ratings	21
3.2 Emergency response access	21
3.3 Environmental and user safety assessment	22
3.4 Track closures and rehabilitation	22
3.5 Resourcing the network	22
3.6 Cross-tenure network connectivity	23
3.7 Supporting facilities	23
3.8 Rider code of conduct	23
3.9 Cycling events and commercial operators	24
3.10 Monitoring and maintenance of the track network	24
3.11 Future changes to the network	25
4. Consultation	26
4.1 Park stakeholders	26
4.2 Other stakeholders	27
Appendices	29
Appendix A Multi-criteria assessment method	29

Appendix B Track difficulty ratings	35
Appendix C Rules of the trail	36
References	37
More information	37

List of tables

Table 1	Visitor management zones	6
Table 2	Proposed Glenrock mountain bike track network outcomes	9
Table 3	Track significance hierarchy	10
Table 4	Proposed Northern Loop section outcomes	13
Table 5	Proposed Middle Loop section outcomes	15
Table 6	Proposed Southern Loop section outcomes	16
Table 7	Proposed Brunner Loop section outcomes	18
Table 8	Benchmark scores and recommendation	29
Table 9	Criterion 1 – Routes are in appropriate locations where park values are protected, and ongoing use is ecologically sustainable	30
Table 10	Criterion 2 – Routes facilitate an enjoyable and safe visitor experience	32
Table 11	Criterion 3: Construction and maintenance costs are reasonable and sustainable	34

List of figures

Figure 1	Strategic framework for the mountain bike plan	5
Figure 2	Visitor management zones	8
Figure 3	Overview of proposed Glenrock SCA mountain bike track network	12
Figure 4	Northern Loop section	13
Figure 5	Middle Loop section	15
Figure 6	Southern Loop section	17
Figure 7	Brunner Loop section	18
Figure 8	Skills areas in the Middle Loop section	19
Figure 9	Trail difficulty rating system	35

Have your say

We want to know what you think about this draft plan. To give us feedback, please send a written submission via:



the [online submission form](http://www.environment.nsw.gov.au/get-involved/have-your-say) at www.environment.nsw.gov.au/get-involved/have-your-say



email to npws.parkplanning@environment.nsw.gov.au



post to Manager, Planning and Assessment, NPWS, Locked Bag 5022, Parramatta NSW 2124.

Written submissions must be received by **6 February 2023**.

Our response to your submission will be based on the merits of the ideas and issues you raise, rather than the quantity of submissions making similar points. For this reason, a submission that clearly explains the matters it raises will be the most effective way to influence the finalisation of the plan.

Submissions are most effective when we understand your ideas and the outcomes you want for park management. Some suggestions to help you write your submissions are:

- write clearly and be specific about the issues that are of concern to you
- note which part or section of the document your comments relate to
- give reasoning in support of your points – this makes it easier for us to consider your ideas and will help avoid misinterpretation
- tell us specifically what you agree or disagree with and why you agree or disagree
- suggest solutions or alternatives to managing the issue if you can.

What happens to your feedback?

Step 1: At the close of the public exhibition period, we consider all submissions and prepare a submissions report.

Step 2: We provide the relevant advisory committees with the draft plan, all the submissions and the submissions report. They consider the documents, make comments on the plan or suggest changes, and provide their advice.

Step 3: Following assessment of submissions and advice, the draft mountain biking plan will be finalised and submitted for approval as a subsidiary plan under the new Glenrock State Conservation Area plan of management.

Your privacy

Your submission will be provided to National Parks and Wildlife Service (NPWS) advisory bodies. Your comments on the draft plan may include personal information. The Department of Planning and Environment complies with the NSW *Privacy and Personal Information Protection Act 1998*, which regulates the collection, storage, quality, use and disclosure of personal information. For details, see our privacy statement. Information that identifies you may be gathered when you use our website or send us an email. If you indicate in your written submission that you object to your submission being made public, we will ask you before releasing your submission in response to any access applications under the *Government Information (Public Access) Act 2009*.

How to use this plan

The *Glenrock State Conservation Area draft mountain biking plan* (the mountain biking plan) is a subsidiary plan under the replacement *Glenrock State Conservation Area plan of management* (NPWS 2022a), once adopted, and should be read in conjunction with the draft plan of management.

The plan informs mountain bike riders and communities about sustainable and authorised mountain bike riding opportunities in Glenrock State Conservation Area. The plan identifies authorised mountain biking routes, details their status and future management, and provides information on the assessment criteria used for developing the track network.

Opportunities for mountain biking in the park will be managed in accordance with the *National Parks and Wildlife Act 1974*, the *NPWS Cycling policy*, the *NPWS Cycling strategy*, *Glenrock State Conservation Area plan of management* (once adopted) and this plan (once adopted)

Acknowledgements

National Parks and Wildlife Service (NPWS) acknowledges Glenrock State Conservation Area is in the traditional Country of the Awabakal People.

This plan was prepared by staff of NPWS.

Contact us

For more information about this plan or Glenrock State Conservation Area, contact the NPWS Lower Hunter Area Office, Nardoo Building, 1 Wetlands Place, Shortland, NSW 2307, or by email at npws.lowerhunter@environment.nsw.gov.au

Summary

Glenrock State Conservation Area (referred to as ‘the park’ or ‘Glenrock SCA’) is located approximately 8 km from the central business district of Newcastle. The park covers an area of 554 ha and is valued for its coastal vistas, ecological richness and wide range of recreational opportunities. The park includes a diverse natural landscape that protects habitat for a wide range of native plants and animals, and has significant Aboriginal cultural and historic heritage values. The park is within the traditional country of the Awabakal People. It also falls within the area of the Awabakal Local Aboriginal Land Council.

Mountain bike riding is an increasingly popular activity across our parks, particularly in urban interface areas. The NSW National Parks and Wildlife Service (NPWS) is responsible for conserving the natural and cultural values of parks, while also providing for public appreciation, understanding and enjoyment of parks. This draft Glenrock SCA mountain biking plan has been developed to ensure the conservation of the park’s environmental, cultural and social values while also providing opportunities for environmentally sustainable mountain bike riding opportunities in the park.

This draft mountain biking plan has been prepared in accordance with a number of NPWS strategies and policies, including the NPWS *Cycling strategy* (NPWS 2021a), *Cycling strategy: guidelines for implementation* (NPWS 2021c) and NPWS *Cycling policy* (NPWS 2021b).

The proposed track network is informed by various audits and assessments undertaken in Glenrock SCA which considered the conservation of park values, growing demand for a variety of cycling experiences on park and the many other recreational activities undertaken in the park.

The proposed track network consists of existing tracks, proposed new tracks, as well as management trails and public roads used to link sections of ‘stacked loops’. Three new skills areas are also proposed in an already highly disturbed area of the park. These will enable riders to improve, practice and test their riding skills. Together these elements of the proposed mountain bike network, situated within a clearly identified recreation zone, will improve the rider experience, provide an ecologically and culturally sustainable track network and enhance visitor safety across the park. The proposed network will result in the closure and rehabilitation of approximately 30 km of inappropriately located, unauthorised track.

Following the assessment of submissions on this draft plan, the proposed track network will be confirmed, and the final plan will be made available on the NPWS website. Prior to implementation, all tracks in the final plan will undergo formal environmental assessment under Part 5 of the *Environmental Planning and Assessment Act 1979* and a user safety assessment. These final assessments may result in changes to the proposed track network.

The final plan will be used by park managers to manage mountain bike riding in the park. Implementation of the plan will be subject to the availability of resources to construct and maintain the track network.

Engagement with user groups will be key to the success of the track network, with a code of conduct to be developed to continue to build a culture of respect among all park users. User self-regulation will assist with the safe management and efficient operation of the track network and help support NPWS education and compliance programs. NPWS will also support volunteers who wish to assist with the maintenance of the track network.

1. Background and context

1.1 Park values

Glenrock State Conservation Area (referred to as 'the park' or 'Glenrock SCA') stretches along the coastline between the residential suburbs of Dudley and Merewether, and it is within both the City of Newcastle and Lake Macquarie City Council local government areas. For a detailed description of the park's values, see the *Glenrock State Conservation Area draft planning considerations* report (NPWS 2022b).

Cultural and historic heritage

The park is a highly sensitive cultural landscape, with cultural significance and value to the Awabakal People and has many known Aboriginal cultural sites. A number of archaeological assessments have been undertaken within Glenrock SCA associated with infrastructure upgrades. An Aboriginal cultural heritage assessment was completed for the park in 2022 and an application submitted for a park-wide Aboriginal heritage impact permit to cover future maintenance works and infrastructure upgrades.

Glenrock SCA contains more than 145 recorded historic sites and almost all of Glenrock SCA is included in the heritage curtilage for State Heritage Register listing 'Glenrock early coalmining sites', recognising the importance of the land surrounding individual sites in managing their significance. Works within the State Heritage Register curtilage are subject to the legislative provisions associated within this listing. All items listed on the State Heritage Register are included in the *Glenrock Lagoon cultural landscape: conservation management and cultural tourism plan* (Griffin nrm 2003) and will be maintained in accordance with best practice management principles set out in relevant heritage plans and conservation management plans.

Natural environment

The park conserves native vegetation which has otherwise largely been removed or severely modified throughout the Lower Hunter region. The park conserves a mosaic of regionally and nationally significant vegetation communities, including 5 threatened ecological communities and 7 threatened plant species. The park also protects many common native plants and animals, some of which have importance to Aboriginal people as totemic species and bush tucker.

Ten threatened animals have been recorded in the park, including the squirrel glider (*Petaurus norfolcensis*). Conservation strategies in the park include canopy restoration projects to restore the tree cover in disturbed parts of the park to strengthen movement corridors. Mammals such as the short-beaked echidna (*Tachyglossus aculeatus*), sugar glider (*Petaurus breviceps*), feathertail glider (*Acrobates pygmaeus*), and the common dunnart (*Sminthopsis murina*) can also be found in the park.

Although many of the species recorded in the park are common on a regional scale, their occurrence in a small, isolated and fragmented bushland remnant surrounded by urban infrastructure is significant and their populations are under increasing pressure. Glenrock SCA's linkages with surrounding bushland are limited, with the only significant bushland corridor through Belmont Wetlands State Park in the south via Awabakal Nature Reserve.

Social value

As one of only 2 significant areas of bushland left in Newcastle, the park plays an important role in providing nature-based recreational opportunities for the local community. The high density and diversity of recreational opportunities in the park are greatly valued by the Newcastle community and visitors from further afield. Recreational opportunities supported by the park include picnicking, walking, trail running, mountain bike riding, gliding, orienteering, surfing, horse riding and cultural tours. NPWS seeks to balance the needs of this wide range of park users, while protecting the park values that make these recreational opportunities unique. Opportunities to incorporate interpretative signage in the park as well as the provision of educational programs that enhance visitor understanding of the park's natural and cultural values is an ongoing priority.

1.2 Cycling and mountain biking in Glenrock SCA

The current track network in Glenrock SCA was authorised in 2010 with the adoption of the *Glenrock State Conservation Area plan of management* (NPWS 2010). Prior to adoption of the 2010 plan of management, the World Trail was commissioned by NPWS in 2008 to audit and review all tracks to determine a viable network that could be formalised and promoted. The track network, located largely in the northern section of the park, included over 14 km of high-quality, signposted single tracks, guided by the International Mountain Biking Association (IMBA) track ratings. Other cycling opportunities in the park include management trails and public roads (see definitions in box below).

Since 2010, the overall demand for mountain biking and the desire for interesting and challenging tracks has continued to grow. This has resulted in the development and use of many unauthorised tracks within the park, some of which are in environmentally or culturally sensitive areas, and others pose serious safety concerns for visitors. A second audit by World Trail was commissioned in 2016 to review the authorised and unauthorised track network in the park and prepare a concept plan for the sustainable expansion of mountain biking opportunities in the park. Further assessments have also included analysing environmental, cultural and visitor values of the park. The concept plan was further developed in consultation with the Glenrock Trail Alliance in 2020.

Development of a new plan of management for the park to replace the previous 2010 Glenrock plan of management has provided the opportunity to evaluate and revise strategies for the conservation of park values into the future along with strategies to manage the growing number of park visitors and increasing demand for a variety of recreational activities, including mountain biking. Once finalised, the Glenrock SCA mountain biking plan will provide for a sustainable level of mountain biking in the park whilst ensuring the protection of park values and visitor safety.

Box 1: Road, track and trail definitions in Glenrock SCA

Cycling: Means riding a bicycle in any style, and does not include the riding of motorised bicycles other than those defined as a 'power-assisted pedal cycle' (e-bikes).

Track: A narrow track that is generally suitable for use by bushwalkers, trail runners, horse riders and cyclists and is not available for motorised vehicle use. Electric bikes, or e-bikes (as defined in the NPWS *Cycling policy*), are permitted on tracks.

Tracks where cycling is permitted may be designated as multi-use, preferred-use or single-use:

- **Multi-use track:** A track designated for shared use by multiple forms of activity. In some instances, multi-use tracks may be limited to just 2 uses, such as cycling and walking.
- **Preferred-use track:** A type of multi-use track that is clearly marked as being designed primarily for one type of user, but other users are permitted to use.
- **Single-use track:** A track designated for use by only one form of activity, for example, cycling or walking only tracks.

Adaptive track: A track suitable for a broad range of riders who typically cannot ride a standard mountain bike and require adapted equipment and trails to suit their physical, intellectual, neurological and sensory abilities (Break the Boundary 2018).

Single track: A narrow track that is wide enough to accommodate riders or walkers in single file.

Looped track: A circuit track with a common start and finish point; traffic usually flows in a single direction.

Stacked loop tracks: Successive loops that allow track users to ride shorter or longer sections and vary the route.

Cross-country: A form of mountain biking that is performed on any combination of single tracks, management trails and sealed roads connecting trails. Cross-country biking emphasises endurance above technical skill.

Skills area: An area with a combination of jumps, tracks and features where riders can develop their skills (including the descending jumps and flow trails in skills areas A and B).

Management trail or trail: A vehicle trail in a park that is maintained to facilitate management activities. Management trails are not available for general public vehicle use (except for non-motorised vehicles such as bicycles).

Public roads: Includes park roads (reserved as park and managed by NPWS) and public roads that traverse the park (roads managed by other agencies) that are available for public use. Public roads are available for cycling, trail running and walking. All public roads in the park are sealed roads. NPWS sealed roads are open to public vehicle use during the day. See Figure 2.

Track head: The main entry point into a track or track network, which may include parking and track/park information. Mountain bike industry standard is to refer to a 'trail head', however, in all NPWS parks a 'trail' refers to a management trail as defined above, therefore the term 'track head' is used in this document.

Note: Definitions in this box are generally based on NPWS policies and strategies unless otherwise stated.



Photo 1 Mountain biking in Glenrock State Conservation Area. John Spencer/DPE

1.3 Strategic framework for the mountain biking plan

The Glenrock SCA draft mountain biking plan sits within a statewide framework for providing and managing cycling opportunities within parks. The processes for cyclists to work with NPWS are made clear. We intend to work collaboratively with stakeholders and other land managers to tackle key challenges, including unauthorised tracks, the safety and enjoyment of visitors on multi-use tracks, and the provision of park visitor facilities.

The NPWS *Cycling strategy: guidelines for implementation* address the way we will deliver the *Cycling strategy*, including the approval process for new tracks and networks, the closure and rehabilitation of unauthorised tracks, how we will work with external parties (including volunteer groups) and our management of cycling experiences. These documents will replace the *Sustainable mountain biking strategy* (OEH 2011).

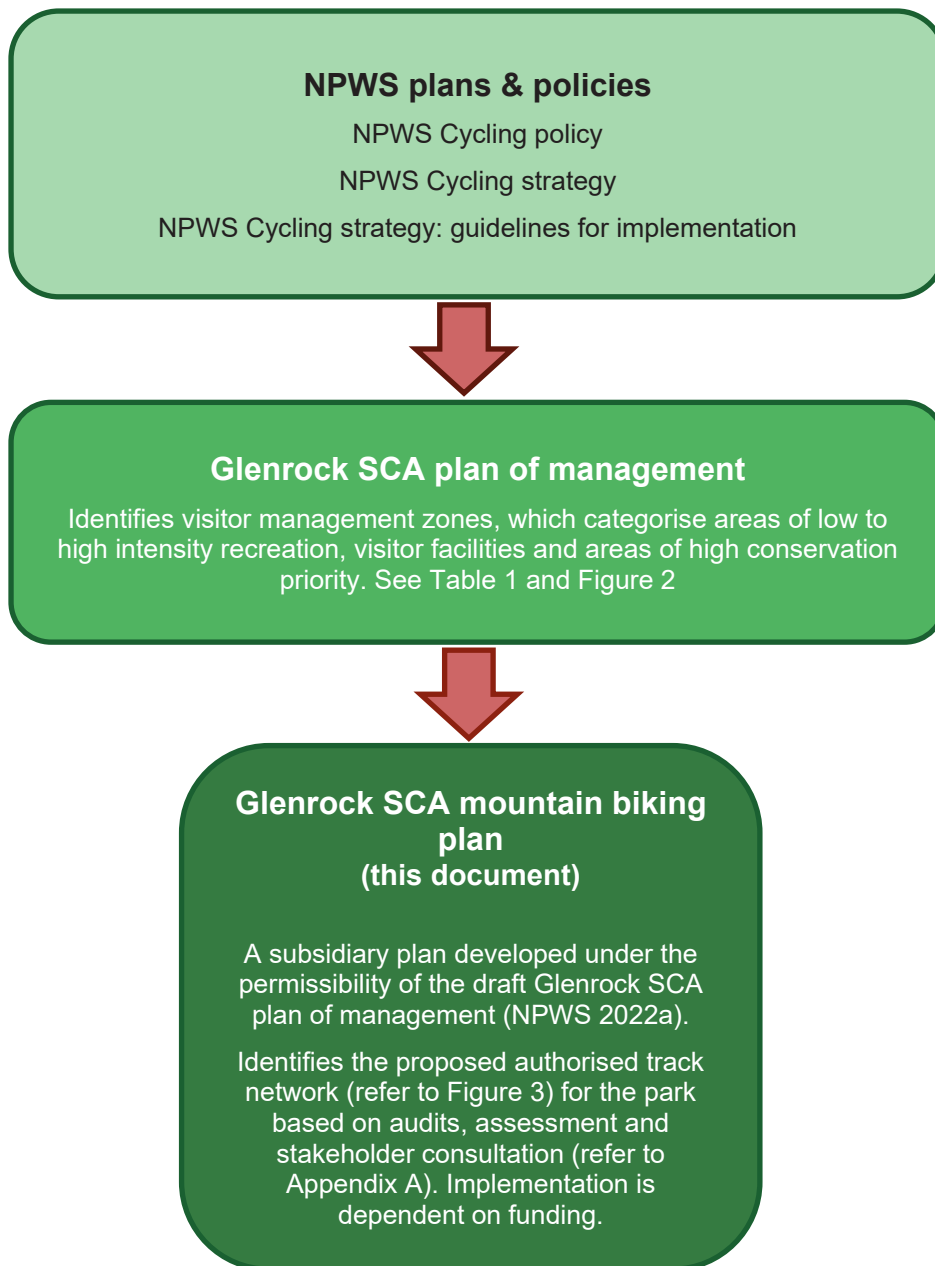


Figure 1 Strategic framework for the mountain bike plan

1.4 Park zoning

Visitor management zones have been defined for Glenrock SCA to guide the provision of visitor facilities and experiences. Three zones have been identified based on physical features, environmental and cultural conservation priorities, and desired levels of visitor use (see Figure 2). The zones identify appropriate locations for passive and active recreational activities and the level of visitor facilities that are compatible with the management principles for each zone (see Table 1).

The proposed mountain bike network is predominately located in Zone 2. Cycling is also permitted on all management trails and public roads across all zones in the park. Cycling is generally not permitted on walking tracks. See definitions in box above.

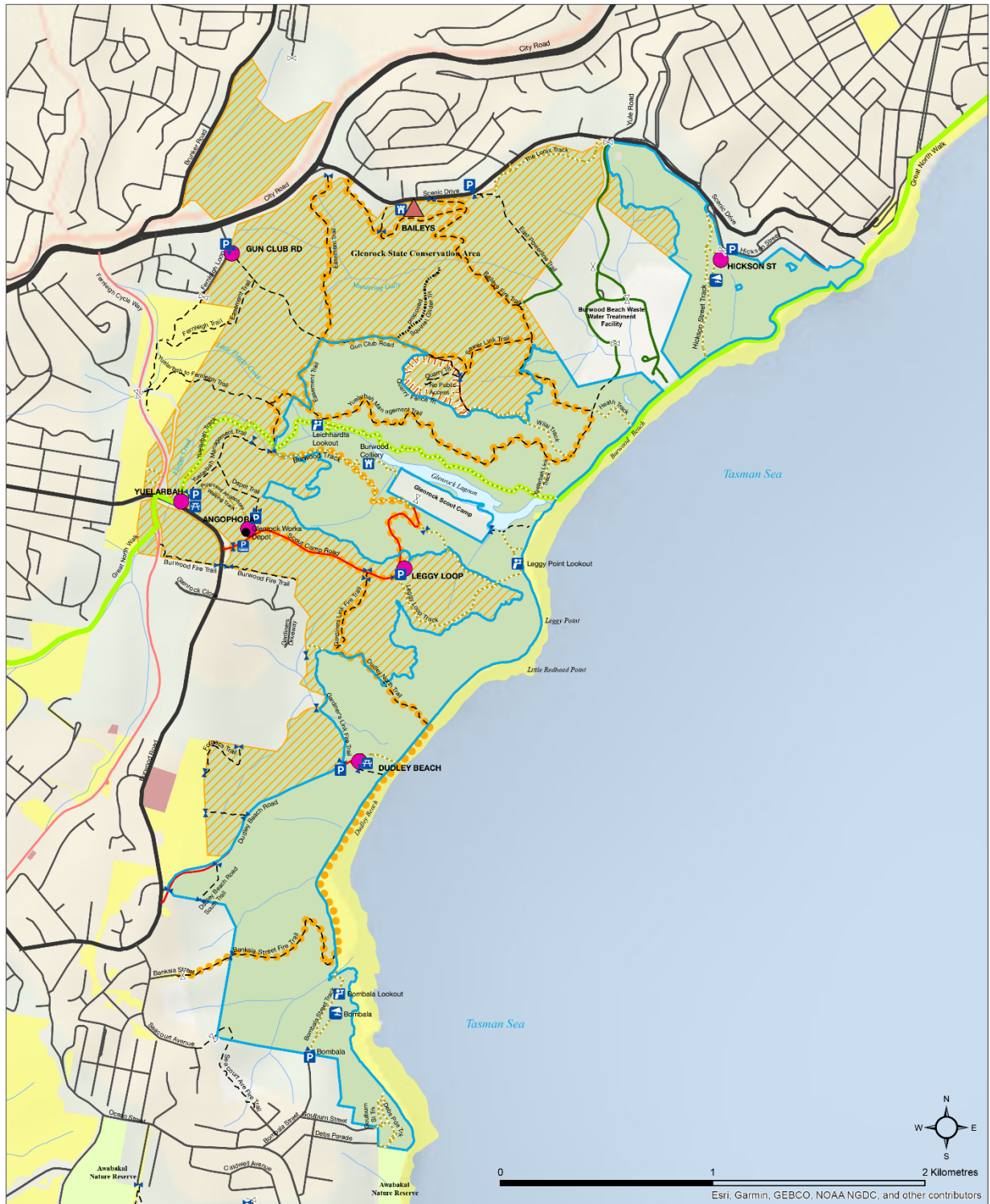
Table 1 Visitor management zones

Feature	Zone 1	Zone 2	Zone 3 Visitor precincts and nodes
Guiding management principles	<p>Conservation of cultural and natural values is the primary priority.</p> <p>Suitable for low impact recreational activities undertaken by relatively low numbers of people.</p> <p>The development of new infrastructure will be avoided and minimised.</p>	<p>Conservation of cultural and natural values is the primary priority.</p> <p>Suitable for low impact activities undertaken by relatively moderate numbers of people.</p> <p>Tracks, trails and basic infrastructure to support recreation may be considered.</p>	<p>Conservation of cultural and natural values and provision of visitor experiences are complementary priorities.</p> <p>Suitable for low impact activities undertaken by relatively large numbers of people.</p> <p>Infrastructure to support large numbers of people may be considered.</p>
General location (see Figure 2)	<p>The eastern area of the park, including areas around Glenrock Lagoon, Burwood Beach and Dudley Beach (down to mean high water mark).</p>	<p>Predominately the western area of the park.</p>	<p>3a Baileys precinct located on the north-western fringe of the park off Scenic Drive.</p> <p>3b Visitor nodes:</p> <ul style="list-style-type: none"> • Hickson Street • Gun Club Road • Yuelarbah (off northern end of Burwood Rd) • Angophora (western end of Scout Camp Rd) • Leggy Loop (eastern end of Scout Camp Rd) • Dudley Beach (eastern end of Dudley Beach Rd).
Visitor opportunities			
Walking and trail running	<p>Network of walking tracks, management trails and roads.</p>	<p>Network of walking tracks, management trails and roads. A trail running network will be identified within the park's track network through signage.</p>	<p>Network of tracks including paved surfaces.</p>
Cycling	<p>Management trails and sealed roads.</p>	<p>Allowed on designated and/or signposted tracks, proposed skills areas, management trails and roads (refer to <i>Glenrock SCA draft mountain biking plan</i>).</p>	<p>Permitted within Baileys precinct and all nodes, except Hickson Street.</p>
Horse riding	<p>Allowed on designated (Figure 2) and/or signposted tracks ('no</p>	<p>Allowed on designated (Figure 2) and/or signposted</p>	<p>Allowed on designated (Figure 2) and/or signposted tracks ('no sign</p>

Feature	Zone 1	Zone 2	Zone 3 Visitor precincts and nodes
	sign – no ride'), on management trails and roads, and designated times on Dudley Beach.	tracks ('no sign – no ride'), on management trails and roads.	– no ride'), on management trails and roads.
Gliding	Gliding pads at Hickson St and Bombala St. Site management plans will be developed for the pads.	Not permitted.	Hickson Street gliding pad (also used for wedding ceremonies and as a scenic lookout).
Surfing and swimming	Burwood Beach and Dudley Beach. All beaches are unpatrolled. Patrolled swimming beaches are located at Redhead Beach (south) and Merewether Beach (north).	Not relevant.	Dudley Beach node: Unpatrolled. Dudley Beach is popular for surfing. Patrolled swimming beaches are located outside Glenrock at Redhead Beach (south) or at Merewether Beach (north).
Abseiling & rock climbing	South of Flaggy Creek off Burwood Track. A site management plan is to be developed.	Not permitted.	Not permitted.
Visitor facilities	No formalised parking provided on park. Basic visitor facilities only. Additional basic facilities may be provided where they are compatible with the cultural and natural values of the zone. Limited potential for intensification of visitor use.	Potential for additional visitor facilities to support sustainable recreational opportunities identified for these areas.	3a Baileys visitor precinct – includes accommodation at Baileys Cottage. Potential for intensification of use and additional visitor facilities in line with zoning, heritage action statement and guided by precinct or master plans. 3b Visitor nodes – may contain facilities, including toilets, parking and picnic areas.
Visitor experience	Opportunities for passive recreation in a natural setting, with limited visitor facilities. Visitors can expect moderate levels of social interaction. Access to water-based recreation activities.	Opportunities for active recreation in a natural setting, with visitor facilities to support recreational activities. Visitors can expect moderate to high levels of social interaction. Includes mountain bike single-track network.	Modified natural environment with areas of intensive recreational use and a broader range of visitor facilities. Visitors can expect high levels of social interaction. Access to water-based recreation activities.

* Naming of individual tracks, management trails and facilities within the park will be developed and may change through consultation with the Aboriginal community and user groups. In some instances a co-naming system may be suitable.

Glenrock State Conservation Area draft mountain biking plan



Visitor Management Zones	Day Use Area	Major road	Fernleigh cycleway
Zone 1	Lookout	Public road sealed	Horse Riding Route
Zone 2	Carpark	Park road sealed	Quarry (no public access)
Zone 3a: Visitor precinct	Carpark - Bus/large vehicles	Management Trail	NPWS Estate
Zone 3b: Visitor node	Glider Pad	Proposed Trail	NPWS Estate Other
	Historic Site	Easement benefiting NPWS	Other Land Managers
	Gate - existing	Walking Track	Local Aboriginal Land Council
	Gate - non NPWS	Proposed Walking Track	Crown Land
		Great North Walk	

Figure 2 Visitor management zones

2. The proposed network

NPWS is responsible for conserving the natural and cultural values of parks, while also providing for public appreciation, understanding and enjoyment. Mountain bike riding is an increasingly popular activity across our parks, particularly in urban interface areas such as Glenrock SCA.

The track network will provide for a range of cycling experiences, including descending jumps and flow trails, cross-country, single track and skills areas. Cycling will continue to be allowed on management trails and public roads in all three zones.

The proposed Glenrock SCA mountain bike track network consists of a stacked loop structure (see Section 1.2) comprising existing and proposed tracks, as well as sections of management trails and public roads to link sections (see Figure 3). Proposed new tracks involve repurposing some existing unauthorised tracks as well as the construction of new track, with the intention of minimising new impacts. The proposed network will result in the closure and rehabilitation of approximately 30 km of inappropriately located, unauthorised track (see Table 2 and Figure 3).

The track network has been designed to protect historic values and environmentally and culturally sensitive areas (see Section 2 in NPWS 2022a), while improving visitor safety across the park and providing enjoyable and safe rider experiences.

Table 2 Proposed Glenrock mountain bike track network outcomes

Track type	Length of track/trail *
Existing authorised tracks	10 km
Proposed newly constructed tracks	21 km
Proposed upgraded/repurposed tracks (currently unauthorised)	7.6 km
Management trails	5 km
Total network length	43.6 km
Closed and rehabilitated tracks	30 km

* Track lengths are estimates only.

All tracks within the proposed network have been evaluated using a **multi-criteria assessment** process. The methodology is detailed in Appendix A and is in accordance with the NPWS *Cycling strategy: guidelines for implementation*. The assessment determines if proposed and/or unauthorised tracks/networks are located appropriately within a park to prevent disruption to park values and maximise rider experience. The assessment also assists in determining tracks that require closure and rehabilitation. The proliferation of unauthorised tracks inappropriately located and constructed in sensitive environments and in cultural areas has caused and continues to cause significant damage to native vegetation, highly erodible soils, animal habitat and cultural objects and places within Glenrock SCA.

The network is designed to be of **local to regional significance** based on the *Australian mountain bike trail guidelines* (MTBA 2019) significance hierarchy and trail models. See Table 3.

Table 3 Track significance hierarchy

Network design	Volume track	Difficulty	Number of loops	Proportion of single track	Minimum infrastructure
National significance	>80 km	Green to double black	4+	>50%	Trail hub or trail centre Carpark, toilets, trail head signage, trail markers, accommodation, bike hire, cafe, event hosting capabilities
Regional significance	20–80 km	Green to double black	2+	>50%	Carpark, toilets, trail head signage, trail markers
Local significance	Up to 20 km	Green to double black	2+	>80%	Carpark, toilets, trail head signage, trail markers

Source: Australian mountain bike trail guidelines (MTBA 2019).

The stacked loop track structure of the proposed network comprises 4 sections (see Figure 3):

- Northern Loop (see Figure 4)
- Middle Loop (see Figure 5)
- Southern Loop (see Figure 6)
- Brunner Loop (see Figure 7).

The stacked loop structure assists safety and functionality, caters to a variety of riding styles and ability levels, and supports the protection of park conservation values. It will provide opportunities for beginner to experienced riders (refer to *Trail difficulty rating system* [Australian Mountain Bike 2020] in Appendix B). Tracks suitable for beginners are located closest to the track heads, with more challenging and descending tracks progressively added further away from track heads.

The network has been designed so it can be ridden in its entirety in one continuous loop (excluding Brunner Loop section). This design limits cross-overs, backtracking or repeating sections. All tracks are unidirectional (one way), with the exception of Track 15 (refer to Figure 6) and are to be ridden in a clockwise direction. Management trails and roads can be ridden in both directions. Signage will indicate track difficulty, length and direction of flow, as well as whether the track is a single-use, multi-use or preferred-use track. The stacked loop structure may also allow for loops to be closed off for exclusive event use.

In addition to the stacked loops, 3 **new skills areas** (refer to Section 2.5) are proposed within the Middle Loop section. These are located in an already disturbed area, including former quarries and existing powerline easements. The proposed skills areas will be readily accessible from Gun Club Road and will enable riders to improve, practice and test their riding skills.

An overview map of the proposed network (Figure 3) identifies the 3 'stacked loop' sections in the main section of the park and the connecting trunk track (Track 1). Each of the 3 stacked loops contain a 'stack' of individual tracks that connect and return onto each other (refer to Sections 2.1 to 2.3 for more detail). The proposed tracks in the western section of the park, off Brunner Road, are a discrete loop network.

The **main entry point and track head** for the network is located at the proposed Gun Club Road visitor node (Track 1). This location is designed to:

- provide essential pre-ride needs for mountain bikers, including track information and existing informal car parking (on council land). NPWS intends to pursue potential opportunities to upgrade Gun Club Road track head precinct as a key visitor node in partnership with City of Newcastle Council. Upgrades will be subject to funding and cross-tenure agreements
- be the primary starting and finishing point for riders, especially for non-local riders
- be the key information point about the track network so riders can plan their ride with a clear idea of distances and track difficulties, and make an informed decision about which tracks they plan to use
- provide a staging area for events
- provide a central point for emergency service responses.

Secondary entry points are located throughout the park (refer to Figures 2 and 3). Parking and access points to the park for mountain biking are primarily located off park. NPWS will require support from other organisations, including City of Newcastle and Lake Macquarie City Council, to improve parking and access at key visitor nodes. Parking within Glenrock SCA is provided at Yuelarbah Track head off Burwood Road (Yuelarbah visitor node), and additional overflow car parking is being built off Scout Camp Road in the Angophora visitor node (visitor nodes are shown on Figure 2). Mountain bike tracks can also be easily accessed from several points off Scenic Drive along the northern boundary of the park. Track 16 provides connectivity from the southern end of the park to the northern loop tracks.



Photo 2 Mountain bike riders pause to take in the spectacular coastal view. John Spencer/DPE

Glenrock State Conservation Area draft mountain biking plan

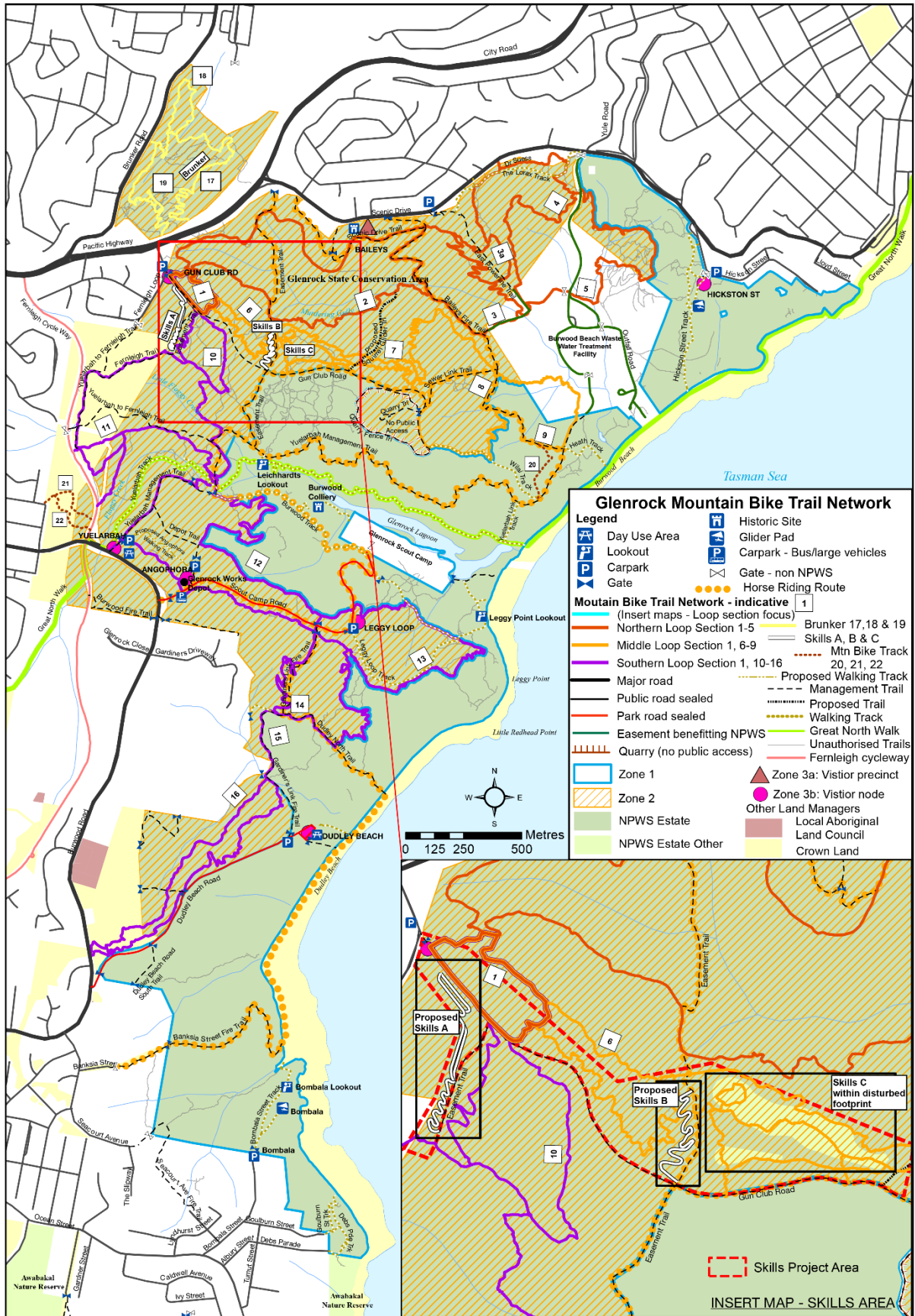


Figure 3 Overview of proposed Glenrock SCA mountain bike track network

2.1 Northern Loop section

The Northern Loop section is located in the north-western corner of Zone 2 (Figure 3) and consists of 5 individual tracks (tracks 1–5). The loop starts and finishes on the trunk track (Track 1) and can also be accessed from secondary entry points at the Baileys visitor precinct (Baileys Cottage accommodation) and Hunter Water Wastewater Treatment Road.

The cross-country loop maximises the 100 m elevation change to provide an enhanced rider experience with flow trails and climbing sections, offering a combination of easy through to very difficult tracks and incorporating adaptive track sections. This Northern Loop section has been designed to avoid and ensure the protection of sensitive habitat for the threatened Newcastle rough doubletail orchid (*Diuris praecox*).

This section is comprised of a combination of new and existing tracks and management trails (see Table 4). Sections of the track network will be multi-use for cycling, horse riding, walking and trail running. Building new track and trail sections through previously disturbed environments will improve opportunities to undertake habitat restoration and weed management. Adaptive track sections will be incorporated where possible.

Table 4 Proposed Northern Loop section outcomes

Track type	Length of track/trail *
Existing authorised tracks	5.6 km
Proposed newly constructed tracks	2.9 km
Proposed upgraded/repurposed tracks (currently unauthorised)	0.5 km
Management trails	1.9 km
Total network length	10.9 km
Closed and rehabilitated tracks	6.5 km

* Track lengths are estimates only.

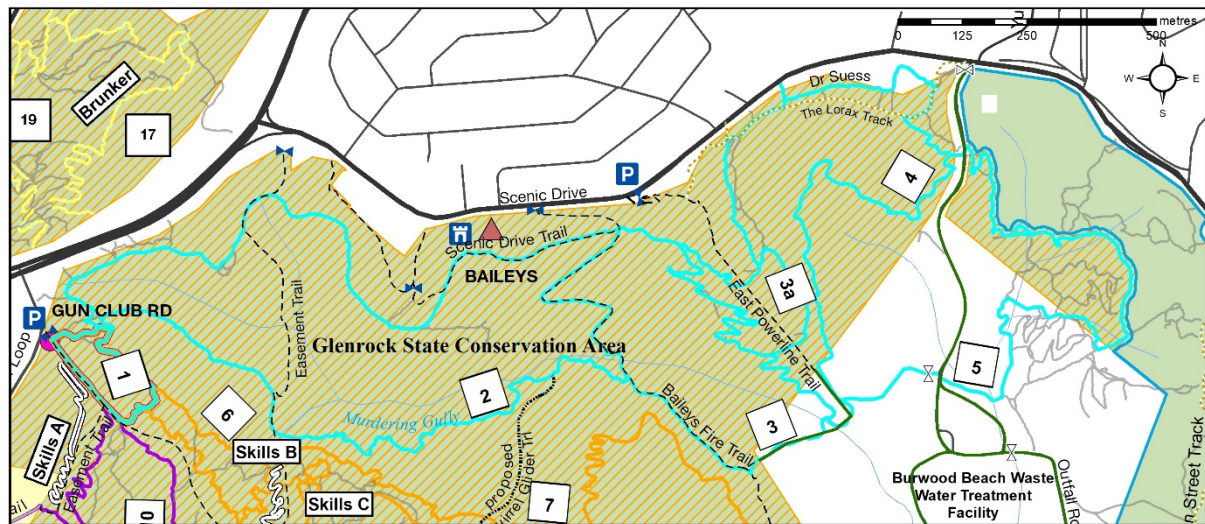


Figure 4 Northern Loop section (see legend on Figure 3)

Track difficulty and rider experience

The diversity of tracks within the Northern Loop provides for a variety of experiences for mountain bike riders. It allows access and exploration for beginner, intermediate and advanced riders. Tracks range from easy to very difficult with steep, descending sections. Using a variety of track section combinations to increase or decrease both length and difficulty provides for different skill levels and rider progression. The stacked loop configuration is comprised of existing tracks, management trails and previously disturbed areas that will be used for new track sections. Sections of Track 5 within this loop traverse land managed by Hunter Water Corporation, and a key objective is to improve the safety of cyclists crossing the sewerage treatment plant access road.

The Northern Loop section (Figure 4) incorporates sections of the following existing formalised tracks and trails:

- Double Barrel (Track 1)
- Gun Club Road (Trunk Trail 1)
- Kenny's (Track 2)
- Easement Trail (Track 2)
- Reload (Track 2)
- Baileys Fire Trail (Tracks 2 & 3)
- High Roller (Track 3)
- BJ's (Track 3)
- It Happens (Track 3a)
- Dr Seuss/The Lorax walking track (Track 4)
- Shaft (Track 5).

Note: The naming of individual tracks, management trails and facilities within the network will be developed and may change through consultation with the Aboriginal community and user groups, and in some instances, a co-naming system may be suitable.

2.2 Middle Loop section

The Middle Loop section is located to the north of Gun Club Road, extending to the east overlooking Burwood Beach (see Figure 5) and consists of 4 individual tracks (tracks 6–9). The Middle Loop section comprises cross-country track and specialised skills areas (refer to Section 2.5). Adaptive track sections will be incorporated where possible.

This is a shorter loop network that traverses the centre of Glenrock SCA. This section incorporates the skills areas and is readily accessible off Gun Club Road. There is a combination of the existing super flow of Seismick (Track 7), the proposed addition of a descending jumps and flow trail and the challenging climb of Snakes and Ladders (Track 8). The new track sections will maximise use of the areas previously disturbed by mining and farming in the park. The proposed new Squirrel Glider Management Trail will improve access for the rehabilitation of the park environment and habitat for the threatened squirrel glider (*Petaurus norfolcensis*).

The loops provide coastal vistas and a side-trip via Hang Ten (Track 20) to the Yuelarbah Management Trail and iconic picnic table, for a spectacular view over Burwood Beach and the Pacific Ocean. Some sections of the track network will be multi-use for cycling, horse riding, walking and trail running.

Table 5 Proposed Middle Loop section outcomes

Track type	Length of track/trail *
Existing authorised tracks	1.5 km
Proposed newly constructed tracks	4.1 km
Proposed upgraded/repurposed unauthorised tracks (currently unauthorised)	0 km
Management trails	1.1 km
Total network length	6.7 km
Closed and rehabilitated tracks	9.0 km

* Track lengths are estimates only.

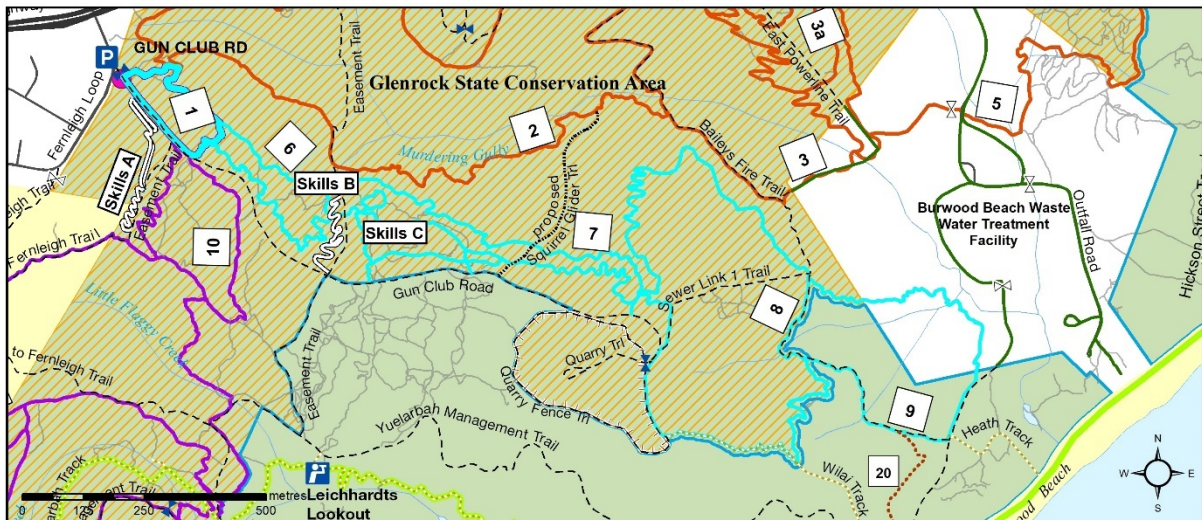


Figure 5 Middle Loop section (see Figure 3 for legend)

Track difficulty and rider experience

The Middle Loop section provides for a variety of experiences for all levels of rider skills. This section is suitable for rider progression from beginner to intermediate with the majority of tracks classed as intermediate. This loop section is comprised of existing tracks, management trails and previously disturbed areas, which will be used for new track sections. A short section of Track 9 traverses land managed by Hunter Water Corporation.

Middle Loop section (Figure 5) incorporates sections of the following existing formalised tracks and trails:

- Double Barrel (Track 6)
- Seismick (Track 7)
- Cliff Jumps (Track 7)
- Pump track (proposed Skills Area C)
- Snakes and ladders (Track 8)
- Baileys Fire Trail (Track 8)
- Gun Club Road (Track 8)
- Yuelarbah Management Trail (Track 9).

Note: The naming of individual tracks, management trails and facilities within the network will be developed and may change through consultation with the Aboriginal community and user groups and in some instances a co-naming system may be suitable.

2.3 Southern Loop section

The Southern Loop section is located to the south of Glenrock Lagoon (see Figure 6) and consists of 7 individual tracks (tracks 10–16).

This section provides a wide variety of cross-country experiences from an easy rated loop for beginners through to more challenging tracks, including descent and climbing tracks off Gun Club Road. The tracks extend to the south of the park through a diversity of habitats and provide a longer endurance experience. The loop is designed to commence at the proposed Gun Club Road visitor node, however, there are secondary entry points from Yuelarbah visitor node, and car parks in Angophora and Leggy Loop visitor nodes. There are also links to the Fernleigh Track (cycleway) and off Burwood Road in the south of the park.

The Southern Loop section will be a combination of existing, new and repurposed unauthorised tracks and management trails (see Table 6). Some sections of the track network will be multi-use for cycling, horse riding, walking and trail running. Adaptive track sections will be incorporated where possible.

Table 6 Proposed Southern Loop section outcomes

Track type	Length of track/trail *
Existing authorised tracks	2.7 km
Proposed newly constructed tracks	10.1 km
Proposed upgraded/repurposed tracks (currently unauthorised)	3.1 km
Management trails	2.3 km
Total network length	18.2 km
Closed and rehabilitated tracks	9.4 km

* Track lengths are estimates only.

Track difficulty and rider experience

This section is suitable for rider progression from beginner to intermediate with a variety of experiences rated as easy and intermediate. Sections of the network will integrate adaptive track sections. The Southern Loop is comprised of existing tracks, management trails, repurposed unauthorised tracks, and previously disturbed areas which will be used for new track sections.

The Southern Loop section incorporates sections of the following existing formalised tracks and trails:

- Easy Way out (Track 10)
- Big Dipper (Track 10)
- Fernleigh Trail (off-park – Crown land) (Tracks 10 and 11)
- Grass tree (Track 11)
- Burwood Track (Track 12)
- Yuelarbah Management Trail (Track 12)
- Deluge Track (Track 12)

- Leggy Loop Track, includes new section of single-use mountain bike track (Track 13)
- Dudley North Trail (Track 14)
- Gardeners Link Trail (Tracks 14 and 15)
- Bus stop – currently unauthorised track (Track 16).

Note: The naming of individual tracks, management trails and facilities within the network will be developed and may change through consultation with the Aboriginal community and user groups, and in some instances, a co-naming system may be suitable.

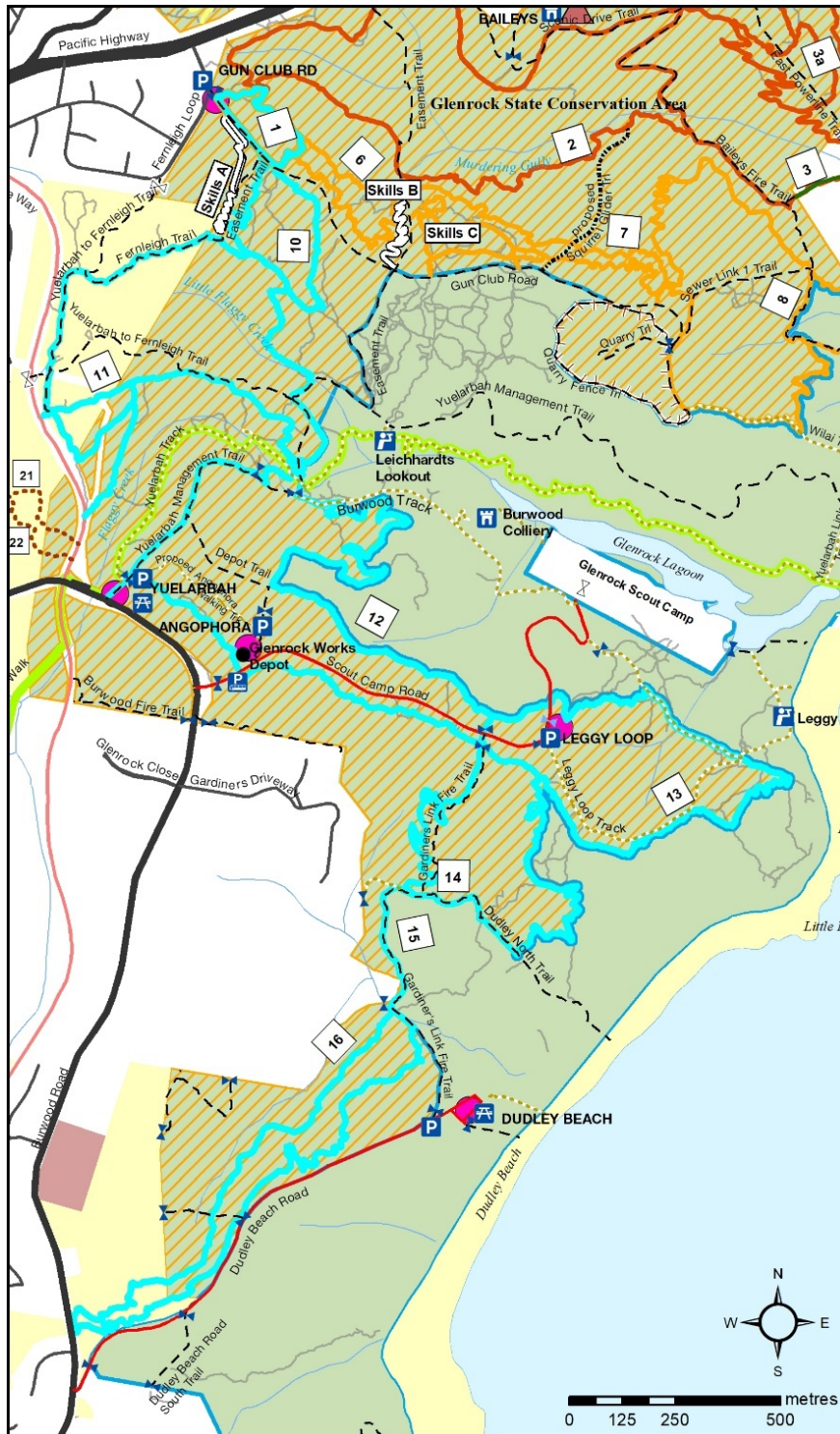


Figure 6 Southern Loop section

2.4 Brunker Loop section

The Brunker Loop section is located in the disjunct north-west portion of the park (see Figure 7) and consists of 3 individual tracks (track 17–19). The Brunker Road section of the park is a discrete area, not connected to the main area of the park, separated by the Pacific Highway (City Road).

There are no existing authorised walking tracks or management trails in this area, however, there are numerous existing unauthorised tracks. This area presents an opportunity to formalise a suitable track network, create new tracks and rehabilitate inappropriately located unauthorised tracks. A dual loop and a flow descent trail are proposed to optimise the terrain. This section is proposed to be designed to avoid and ensure the protection of sensitive habitat for the threatened black-eyed Susan (*Tetradlea juncea*) and Newcastle rough doubletail orchid.

Within the Brunker Road Loop section there will be a combination of new and existing tracks (see Table 7). Parts of this loop are proposed to be multi-use tracks shared with trail runners. This section of the park is bordered by City of Newcastle Brunker Road, RMS Road reserve and a transmission line easement. Formalising access into this section of the park will require collaboration with these parties. Park users are advised that the absence of formal access or parking areas that service this section of the park presents safety risks to visitors. Improved access to this area will also enable bush regeneration activities to be undertaken.

Table 7 Proposed Brunker Loop section outcomes

Track type	Length of track/trail *
Existing authorised tracks	0 km
Proposed newly constructed tracks	3.3 km
Proposed upgraded/repurposed tracks (currently unauthorised)	4 km
Management trails	0 km
Total network length	3.7 km
Closed and rehabilitated tracks	3.3 km

* Track lengths are estimates only.

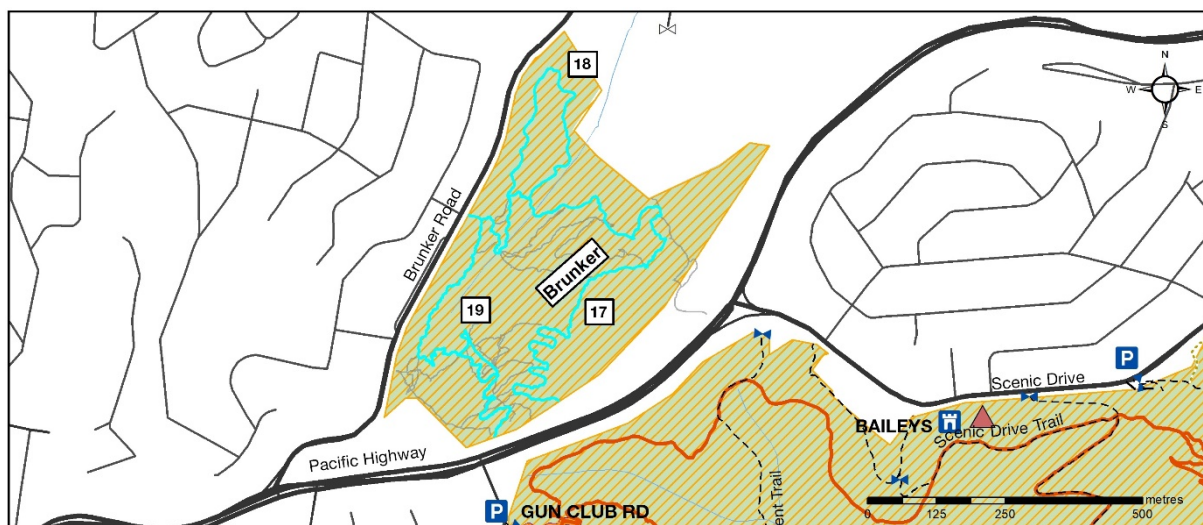


Figure 7 Brunker Loop section

Track difficulty and rider experience

This section is suitable for rider progression from beginner to intermediate, with a variety of experiences rated as easy and intermediate.

2.5 Skills areas

Three skills areas are proposed in a highly disturbed area (including former quarries and existing powerline easements) located within the Middle Loop Section (Section 2.2). The proposed skills areas will be readily accessible from Gun Club Road and enable riders to improve, practice and test their riding skills. Technical and downhill style features are proposed in this area.

The proposed skills area concept plan is made up of 3 areas: A, B and C. Below is a summary of each proposed area (refer to Figure 8 and inset on Figure 3). The length of unauthorised tracks to be closed and rehabilitated in this area are captured in Table 5 (Section 2.2 Middle Loop section) which overlaps this area.

Areas A and B are on Ausgrid power line easements. NPWS is working with Ausgrid on the development of these proposed skills areas, including descent jumps and flow trails.

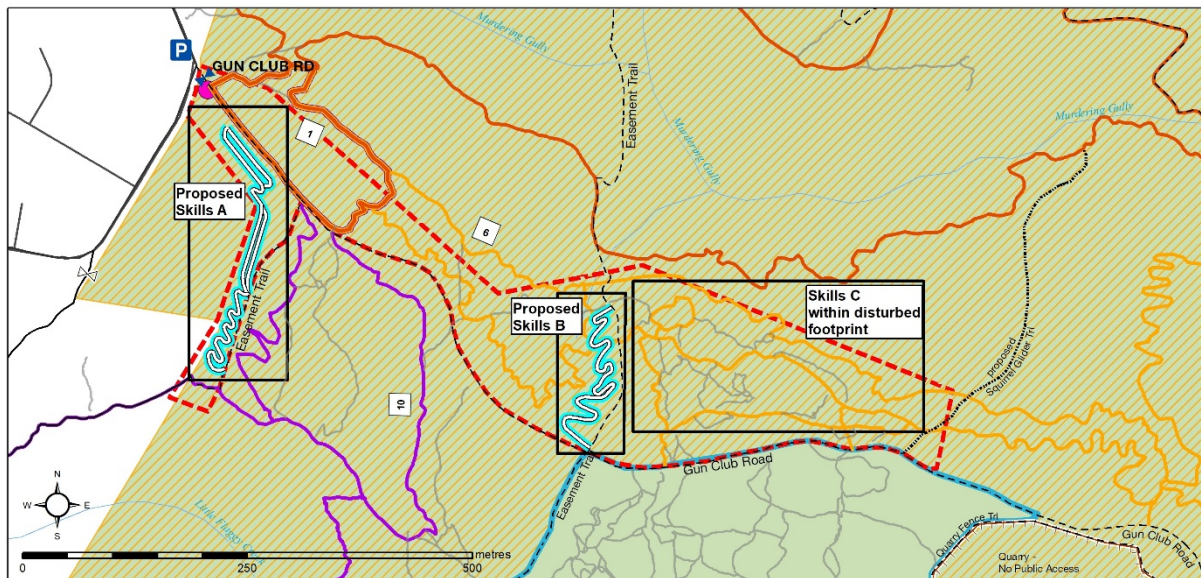


Figure 8 Skills areas in the Middle Loop section

Area A

Area A is located on the first power line easement area at the entrance to the park, parallel to Gun Club Road and the Easement Trail and adjacent to the proposed Gun Club visitor node. This location provides good accessibility for events and has the potential to act as a stand-alone feature visible from the proposed formalised track head car park for spectators and visitors to the area. The skills track is unidirectional, and the return is either via a short section of Track 11 and then the climbing section of Track 10 or the existing management trail running within the easement.

The track is intended to include technical features. It will feature a moderately steep gradient (around 10–15%) with frequent jumps and berms. Imported fill will be required to construct these features, which will be locally sourced gravel from the quarry. The majority of the track would be in the cleared firebreak area beneath the power lines, occasionally running into the forested areas.

Area A has the potential to offer 2 separate tracks running side-by-side. One would be a flowing jump track with rollable table-top jumps and berms, rated easy through to intermediate. The other would be a more challenging track, rated difficult, with some larger jumps, technical lines and drops. Area A is subject to detailed designs.

Area B

Area B is situated on the Scenic Drive powerline easement, to the north of Gun Club Road, in close proximity to Area C. Gun Club Road provides an easy linkage to the track head. Area B is a unidirectional track rather than a loop, return is via the parallel management trail.

Area B will feature a moderately steep gradient (around 10–15%) with frequent jumps and berms. Imported fill will be required to construct these features, which will be locally sourced gravel from the quarry. The majority of the track would be located in the cleared firebreak area beneath the power lines, occasionally running into the forested areas. This area is wide enough to allow optional lines, A, B, C type multiple features to satisfy a wide variety of users and skill levels. Area B is subject to detailed designs.

Area C

Area C is situated to the north of Gun Club Road adjacent to the Scenic Drive power line easement and in close proximity to Area B. Area C incorporates the existing skills of Cliff Jumps (Track 7), Six Shooter and Pump Action. NPWS proposes to develop the skills opportunities in this area. Imported material from the local quarry would be required to construct these features. This area can accommodate optional lines, A, B, C type multiple features to satisfy a wide variety of users and skill levels and adaptive bikes. Area C is subject to detailed designs.

Track difficulty rating for the skills areas

The difficulty rating for these areas could be designed for a variety of different levels but would generally be expected to fall in the intermediate to extreme range.



Photo 3 Mountain bike rider in Glenrock SCA. John Spencer/DPE

3. Implementing the network

3.1 Track design, construction and difficulty ratings

As part of the revised NPWS *Cycling strategy*, NPWS has adopted the *Australian Mountain bike trail guidelines* (MTBA 2019) produced by Mountain Biking Australia, now AusCycling. These guidelines align with the International Mountain Bicycling Association (IMBA) track standards and have been developed to specifically meet the needs and environment of Australia. All design, construction and maintenance of the track network will be carried out in accordance with the *Australian mountain bike trail guidelines* (MTBA 2019) and NPWS *Cycling strategy: guidelines for implementation*. The approaches for construction and maintenance of tracks will vary depending on cultural and environmental sensitivities, and tracks will generally be designed for dry weather riding. Protection of the park and its values will remain the priority in any track design and construction throughout Glenrock SCA.

Where possible, track design and construction will also incorporate adaptive tracks to consider the potential for greater accessibility using the *Australian adaptive mountain bike guidelines* (Break the Boundary 2018), also referred to in the NPWS *Cycling strategy*.

Implementation of the proposed Glenrock mountain bike track network will be staged as part of an adaptive management approach to take account of ongoing management operations in the park and minimise disruption to park users. Works will also be dependent on the availability of upgrade and ongoing maintenance funding. Authorised tracks will be added to the mountain biking network map for Glenrock SCA. This map will be available on the NPWS Glenrock SCA visitor webpage and updated on a regular basis.

Track difficulty will be rated using the recognised symbology and descriptions outlined in Appendix B from the *Trail difficulty rating system* (Australian Mountain Bike 2020). This includes track head signs at the start of the network, where maps and track information are provided, and on way-finding markers throughout the network.

The rating system uses simple geometric symbols to communicate 5 different skill levels, ranging from very easy to extreme (refer to Appendix B). The system has been designed to take into consideration a mountain bike rider's skill level, fitness level, track width, track surface and obstacles (including technical track features), and track gradient.

Management trails that are incorporated in the mountain bike network will also have a difficulty rating applied.

3.2 Emergency response access

As part of a park-wide signage plan to enhance the accessibility, safety, compliance and enjoyment of all tracks and trails in Glenrock SCA, geographical positioning coordinate markers are proposed to be included within the mountain bike network to allow users to readily advise emergency services of their location if required. The central access point at the proposed Gun Club Road visitor node (see Figure 3) – will also assist in providing a more coordinated emergency service response when needed.

The location of the proposed skills areas and descent trails are deliberately concentrated off Gun Club Road for ease of access from the Pacific Highway for emergency services. Mountain biking participants should be familiar with NPWS *Visitor safety policy*.

3.3 Environmental and user safety assessment

An environmental impact assessment (EIA) is required under NPWS statutory obligations for new tracks, including the inclusion of any unauthorised tracks into a track network. They are also used for maintenance activities when required. The EIA process only commences once all other assessments have been completed and NPWS is willing to progress with a track(s) or event (see Section 3.9). Further details of assessment processes can be found in the *NPWS Cycling strategy – guidelines for implementation*.

Environmental impact assessments will also be used to determine if the track will be a multi-use track, single-use track or preferred-use track (see definitions in Box 1). It is recognised that single track provides for a more enjoyable experience for mountain bike riders and preferred-use tracks can prevent user conflict and increase safety.

Riders should be familiar with NPWS *Visitor safety policy*. A code of conduct may be developed to further enhance user etiquette and prevent user conflict.

3.4 Track closures and rehabilitation

The multi-criteria assessment developed by NPWS in the *NPWS Cycling strategy: guidelines for implementation*, Appendix A, has been used to assess unauthorised tracks to determine their suitability for inclusion in an authorised network for Glenrock SCA. Unauthorised tracks located in areas with environmental and cultural sensitivities, and which are causing impacts to these values, will be prioritised for rehabilitation and not included in the track network.

Factors to consider in the closure of unauthorised tracks include user education through a well-considered communication plan; signage to clearly identify unauthorised trails ('no sign – no ride' principle); the use of robust, safe and appropriately placed physical barriers; water management to enable natural regeneration and assisted revegetation; and compliance operations and use of surveillance cameras.

As the new track network is created and existing authorised tracks are enhanced, the closure and rehabilitation of unauthorised tracks outside of the track network will be a park management priority. This draft Glenrock SCA mountain biking plan proposes closure and rehabilitation of approximately 30 km of unauthorised tracks, to be staged with priority given to environmental and culturally sensitive areas.

In addition, NPWS may close tracks in the network on a temporary or permanent basis as required and particularly:

- during prolonged or severe episodes of wet weather in areas where soil types are easily eroded
- if MTBA track standards cannot be maintained
- to protect natural or cultural values
- for management needs, for example, track maintenance or hazard reduction burn program
- where safety concerns arise.

To develop a culture of stewardship, volunteer groups will be encouraged to assist in the rehabilitation of unauthorised tracks to balance the creation of new biking opportunities.

3.5 Resourcing the network

Actions in this plan will be prioritised and implemented as resources allow. State Government has already assisted with the improvement of facilities such as track upgrades and future planning across Glenrock SCA. In 2021 the NSW Government committed

\$91.5 million from the NSW COVID-19 economic recovery fund to boost ecotourism in NSW national parks. This included \$600,000 for planning of enhancements to the mountain bike track network and upgrade works in Glenrock SCA. This funding will be used to assist with the implementation of this plan once approved.

Funding for track construction and maintenance may be supported through alternative sources, including corporate sponsorship and other funding models. In addition, volunteer assistance in the maintenance of tracks is planned to continue supporting part of the upkeep of the Glenrock SCA mountain bike track network.

Naming of individual tracks, management trails and facilities within the network will be developed through consultation with the Aboriginal community and other user groups. In some instances a co-naming system may be suitable.

To discuss sponsorship opportunities directly in relation to the mountain bike track network please contact the Lower Hunter area office at npws.lowerhunter@environment.nsw.gov.au

3.6 Cross-tenure network connectivity

Glenrock SCA's proposed mountain bike network traverses lands managed by multiple local, state and federal agencies. To maintain and improve network connectivity between multi-tenured tracks, ensure their long-term viability and user safety, NPWS will seek to collaborate with other land managers to formalise agreements where possible.

This includes easement negotiations with Hunter Water Corporation and Crown Lands (part of the NSW Department of Planning and Environment). NPWS will also seek to work with local governments to develop off-park facilities, such as carparking, to support on-park activities that provide health and economic benefits to the local community and wider region. A collaborative approach with other land managers will also help to mitigate and minimise environmental, cultural and state heritage impacts associated with infrastructure works. In addition, NPWS is working with Ausgrid on the development of the proposed skills and descent trails areas on the powerline easements.

3.7 Supporting facilities

The *Australian mountain bike trail guidelines* (MTBA 2019) identify the supporting facilities required based on the level of significance of the mountain biking facility. The proposed mountain biking network is considered to be a 'facility of regional significance' (20–80 km of track). Refer to Table 3. Accordingly, a car park, track head signage and track markers are required. The *Australian adaptive mountain biking guidelines* (Break the Boundary 2018) also provide recommendations for minimum requirements for accessible amenities. NPWS will use these guidelines to aid in the planning of inclusive cycling experiences in the park.

3.8 Rider code of conduct

The success and continuation of mountain biking in Glenrock SCA depends on rider compliance with the provisions of this plan, the park plan of management, and the NPWS *Cycling strategy* and *Cycling policy*. NPWS will work with mountain biking groups to ensure mountain biking continues as safely and sustainably as possible.

All riders in Glenrock SCA are expected to abide by the IMBA *Rules of the trail* (also known as the IMBA code of conduct, see Appendix C). The *Rules of the trail* will be promoted on track head signs and on the NPWS website, and riders should maintain awareness of whether a track is a preferred-use, single-use or multi-use track.

Tracks in the network will be signposted using the MTBA trail difficulty ratings (Appendix B). Riders are expected to responsibly gauge their own ability to ride a track, according to the information and guidance provided on signs and online.

Tracks may be closed during wet weather due to the potential for greater erosion, unless a track is specifically marked for all-weather riding.

The potential impacts of bike lights on wildlife are not fully understood and therefore night riding is not recommended.

NPWS will use a range of strategies to ensure compliance with regulations governing mountain bike riding in the park, including education, formal warnings or infringement notices.

3.9 Cycling events and commercial operators

Glenrock SCA is used extensively for a broad range of active and passive recreation activities. Events by large, organised groups have the potential to create conflict with other park users and to put strain on points of interest in the park or on park facilities such as car parking, access points and tracks. Large numbers of mountain bike riders attending events can also increase 'wear and tear' of the track network, while spectators to events can also contribute to the hardening of vegetated areas and increase the potential for erosion. These are important considerations for NPWS and the protection of Glenrock's conservation values.

Organised mountain biking events can promote park values and contribute to positive park experiences. NPWS will assess proposed organised mountain biking events under the NPWS *Events, functions and venues policy*, including consideration of potential impacts on natural and cultural values, the track network and other park users. Consent for events may be given subject to NPWS conditions. The proposed loop track structure of the track network may assist events by allowing certain loops to be used for an event while others remain open to full public use.

Commercial operators conducting organised mountain bike lessons and tours in the park are increasing. To ensure sustainable park visitor numbers into the future, a selective licensing framework may be considered to restrict the number of commercial licences for an activity or location to protect visitor safety, cultural and natural values and to enhance visitor experiences.

3.10 Monitoring and maintenance of the track network

Ongoing monitoring of the mountain bike network is an essential component of responsible management. Users of the network are in the best position to carry out monitoring, and NPWS seeks the cooperation of all riders to keep local NPWS staff informed about the condition of tracks, creation of illegal tracks, signage issues and other infrastructure through regular reporting. NPWS will seek to develop a feedback system for this purpose.

For ongoing maintenance of the track network, NPWS will prepare a maintenance program to ensure routine maintenance is carried out in a timely manner and provision is made for non-routine works. Maintenance work will be prioritised and implemented as resources allow.

Mountain bike riders must be aware that Glenrock SCA provides for a multitude of recreational users and encourage all users to assist in the upkeep of tracks through opportunities outlined on the NPWS volunteering platform.

Where tracks become unsafe or their continued use has the potential to exacerbate an environmental impact, they may need to be temporarily closed to undertake maintenance,

redesign or realignment. Where possible, NPWS will make decisions of this kind in consultation with relevant stakeholders.

Weed control and management in Glenrock SCA is based on the *Hunter regional strategic weed management plan* (Hunter LLS 2017). This plan identifies weeds of significance and will guide maintenance activities associated with the mountain bike network as relevant.

The closure and rehabilitation of unauthorised tracks that intersect other land tenures will require a collaborative approach and support from the community and other land managers.

3.11 Future changes to the network

The development and maintenance of the proposed network will continue to be implemented as resources and budget permits.

Over time, there may be a need to develop new tracks or realign tracks to protect park values or improve rider experience and safety. The creation of new tracks will be permitted only within Zone 2 (as shown in Figure 2) and will be subject to environmental impact assessments, assessment against the criteria outlined in the multi-criteria assessment (Appendix A) and consistent with the NPWS *Cycling strategy*.

Naming of individual tracks, management trails and facilities within the network will be developed through consultation with the Aboriginal community and other user groups. In some instances a co-naming system may be considered suitable. Alignment of tracks are likely to change as a result of the Aboriginal heritage impact permit being developed for the park.



Photo 4 Baileys Fire Trail. John Spencer/DPE

4. Consultation

This draft mountain biking plan has been developed through targeted engagement with various user groups, including the Aboriginal community, mountain biking community, bush regeneration volunteers, trail runners, bike retailers, mountain bike event organisers, NPWS Eco Pass operators and other recreational groups. User group consultation has assisted with the development of a proposed track network that conserves the cultural and environmental values of the park, minimises safety issues and user conflict, and maximises rider experience. Ongoing engagement with these groups and the use of experienced contractors for track design and construction will ensure tracks are appropriately developed and maintained to a high standard.

4.1 Park stakeholders

A consultative committee, comprised of nominated representatives from a range of recreational user groups and stakeholders, was formed in 2006 to assist NPWS to develop strategies for management of emerging issues such as the growth of mountain bike use.

Extensive community engagement was undertaken prior to 2010 to assist in the development of a sustainable mountain bike track network. The exclusion of cycling in the southern area of the park and the continued growth of the activity and proliferation of illegal tracks resulted in a review of the network. World Trail undertook community consultation to assess community expectations and developed a preliminary concept plan for a stacked loop system in 2016. NPWS developed this concept further with the Glenrock Trail Alliance to the current concept plan.

A multi-criteria assessment (Appendix A) was completed for the proposed track network as well as tracks proposed to be closed and rehabilitated. This assessment determines the appropriateness of a track location to minimise disruption to park values and maximise rider experience. The following elements were considered as part of the multi-criteria assessment for the development of this plan:

- routes minimise environmental and cultural value impacts and ongoing use is ecologically sustainable
- routes facilitate an enjoyable and safe visitor experience for all users
- construction and maintenance costs are reasonable and sustainable.

Targeted stakeholder engagement with key stakeholders, including members of the cycling community, cycling industry representatives, other recreational user groups (e.g. trail running, gliding, climbing, environmental, scouts) has been undertaken during 2021 and 2022 in the development of this plan. Community engagement will be ongoing in the development of a code of conduct, implementation of the strategy and maintenance of the track network.

Consultation has also been undertaken with the NPWS Hunter Central Coast Regional Advisory Committee, which is made up of community representatives from the Aboriginal community, Nature Conservation Council of NSW, National Parks Association of NSW and other individuals with relevant expertise.

The Aboriginal community have been engaged as part of a 2022 park-wide cultural landforms risk assessment for Glenrock and will continue to be consulted during development of the proposed track network. Sensitive landscape modelling and field survey have informed the development of an Aboriginal cultural heritage assessment, and a park-wide Aboriginal heritage impact permit will be developed for any new infrastructure works or upgrades.

4.2 Other stakeholders

Hunter Water Corporation

Parts of the mountain bike track network traverse land managed by Hunter Water Corporation, namely the Burwood Beach Wastewater Treatment Works. NPWS is negotiating an easement agreement with Hunter Water to ratify NPWS management access, authorised public access, upgrading and maintenance of the track network. The proposed changes to the network aim to address safety issues of bikes entering and crossing the treatment plant access road. Collaborations between NPWS and Hunter Water will ensure that the alignment and maintenance of the tracks in these areas are improved for safety and do not impede access to the treatment plant.

City of Newcastle

City of Newcastle promotes cycling in Glenrock as a key attraction, and events such as the Port to Port attract visitors and tourism revenue for the region. Key access points to the cycling network are through land and roads managed by City of Newcastle, including access to the track head off Fernleigh Loop at Gun Club Road. This precinct provides connectivity from Lake Macquarie City Council into the Newcastle Local Government Area (LGA), informal parking and is the event precinct for cycling and trail running events. A collaborative cross-tenure approach to resolving car parking and pedestrian/cyclist's safety will optimise the visitor experience and require support from City of Newcastle.

NPWS will need to consult with City of Newcastle prior to the formalisation of any tracks in the Bruncker Road section of the park to facilitate safe access.

Lake Macquarie City Council

The southern area of the park is accessed through land and roads managed by Lake Macquarie City Council. The popular council-managed Fernleigh Track traverses the park, and the NPWS Yuelarbah car park is promoted by council to access this popular community resource and is a secondary entry point into the mountain bike network in the park. The car park frequently exceeds capacity, and a collaborative approach with council to resolving safety issues associated with informal parking off Burwood Road and other areas is required.

Glenrock Scout Camp

The Glenrock Scout Camp land (also known as the Glenrock War Memorial Scout Training Camp) is a private property inholding within the park. Informal community access through the scout camp may conflict with Scouts NSW's management objectives, and unauthorised tracks create environmental issues. NPWS will continue to work with Scouts NSW to manage safe public access and unauthorised tracks leading through the camp.

Crown Lands

Crown reserves, managed by Crown Lands, join the park (Figure 2) at the entrance to Dudley Beach Road and the Kahibah area. NPWS will work to formalise a Crown land licence to support management of the mountain bike tracks that traverse Crown reserves adjoining Glenrock SCA.

Ausgrid

Ausgrid maintains the vegetation and infrastructure in the transmission line easements that criss-cross the park. The previously disturbed environments, moderately steep terrain, ease of access off Gun Club Road and proximity to other proposed skills areas provide an opportunity to deliver the gravity experience that riders are seeking. The highly disturbed environment parallel to Gun Club Road can accommodate a significant upgrade to provide a car park, track head and events precinct to improve visitor experience and safety. NPWS will work collaboratively with Ausgrid to plan and seek necessary approvals for the appropriate use of the easements as skills areas off Gun Club Road.

Transport for NSW (formerly Roads and Maritime Services)

The Pacific Highway (City Road) divides the park in the north-west (Figure 2). NPWS will need to consult with Transport for NSW prior to the formalisation of any tracks in the Bruncker Road section of the park to facilitate safe access. The proposal to formalise a network of tracks in the Bruncker Road area of the park will require a collaboration with Transport for NSW.

The cycleway managed by Transport for NSW, from Fernleigh Loop to Scenic Drive, provides connectivity from the Gun Club Road visitor node to the City of Newcastle. There are legacy drainage issues associated with the cycleway, and NPWS will work with Transport for NSW to resolve the problem.

Connection across the Pacific Highway to the northern section of the park (Bruncker Road) will require further negotiation.

Department of Defence

The Department of Defence's Bullecourt Barracks joins the northern, Bruncker Road section of the park.

Appendices

Appendix A Multi-criteria assessment method

This is an extract from the NPWS Cycling strategy: guidelines for implementation.

Where a park is considered suitable for cycling activities, individual authorised and unauthorised tracks or networks are evaluated using a multi-criteria assessment. This assessment determines if proposed and/or unauthorised tracks/networks are located appropriately within a park to prevent disruption to park values and maximise rider experience. The assessment also assists in the determining tracks that require closure and rehabilitation. The following 3 criteria form the basis of the multi-criteria assessment:

- Criterion 1 – Routes are in appropriate locations where park values are protected, and ongoing use is ecologically sustainable.
- Criterion 2 – Routes facilitate an enjoyable and safe visitor experience.
- Criterion 3 – Construction and maintenance costs are reasonable and sustainable.

The assessment results in an indicative benchmark score for each of the 3 criteria to give a final overall score for each individual track out of 15. Table 3 is provided to assist decision-making and rank the proposed cycling tracks once the multi-criteria assessment scores have been collated for each criterion. Criteria and benchmarks are intended as a guide and may be altered to meet individual park requirements.

The 3 criteria (Tables 4, 5 and 6) assessed are given equal weighting, however, immediate dismissal of a track or track network occurs if:

- tracks are likely to cause extensive and irreversible damage to cultural heritage artefacts
- tracks are likely to cause extensive and irreversible damage to natural, environmental park values
- there is an incompatibility with park management actions.

In some instances, park managers may decide to include tracks or trails in the network that do not meet the scores in Table 3, for example, if they are identified as necessary for fire management. Alternatively, on rare occasions other tracks that rank highly in the multi-criteria analysis may be excluded for park management reasons.

The multi-criteria assessment is also a valuable tool used to prioritise the closure and rehabilitation of unauthorised tracks. This prioritisation is completed by evaluating the tracks against Criterion 1 (Table 4), which assesses environmental and cultural values.

Table 8 Benchmark scores and recommendation

Score or reason	Recommendation
Overall score greater than 12/15	Formalise/construct
Overall score 8–12/15	Consider formalising/constructing
Overall score less than 8/15	Close/do not construct
Score for criterion 1 less than 3.5/5	Close/do not construct
Score for criterion 2 less than 2.5/5	Close/do not construct
Outside area enabled in plan of management	Close/do not construct
Likely to cause significant fragmentation of habitat	Close/ o not construct

Table 9 Criterion 1 – Routes are in appropriate locations where park values are protected, and ongoing use is ecologically sustainable

Indices	Desired outcome	Benchmark principles	Score
Aboriginal cultural values	Protect Aboriginal object, place, or site	Establish buffers zones for: <ul style="list-style-type: none"> isolated objects (e.g. modified trees) closed sites (e.g. shelters) open sites (e.g. middens). 	1 = new/existing track intersects sites 2 = new track within buffer 3 = existing track within buffer but not impacting 5 = track outside buffer
Historic heritage values	Protect listed heritage item, property, or place	Establish buffers zones for: <ul style="list-style-type: none"> isolated artefact, local or state heritage listed item. 	1 = new/existing track intersects sites 2 = new track within buffer 3 = existing track within buffer but not impacting 5 = track outside buffer
Natural values	Protect significant landscapes or geological form	Establish buffers zones for: <ul style="list-style-type: none"> significant landscape features specific geological forms. 	1 = new/existing track intersects sites 2 = new track within buffer 3 = existing track within buffer but not impacting 5 = track outside buffer
	Protect threatened flora species and ecological communities	Establish buffers zones for: <ul style="list-style-type: none"> threatened flora species or population threatened ecological communities (TECs). Tracks situated to avoid new vegetation clearing for areas in biodiversity values maps. Track situated to avoid new vegetation clearing in TECs.	1 = new/existing track within TEC or in close proximity to threatened flora species 2 = new track within buffer but no likely impact; existing track in buffer and potential for impact on TEC 3 = existing track within buffer but no likely impact 5 = outside buffer
	Protect threatened fauna species habitat	Establish buffers zones for: <ul style="list-style-type: none"> protected species (except bird species and species with large home range) priority fauna habitat. Other species-specific limitations may apply.	1 = new/existing track within buffer of priority habitat or known location of threatened fauna 2 = new track in buffer but no likely impact 3 = existing track in buffer or new track within priority habitat: no likely impact 4 = existing track in priority habitat but no likely impact 5 = outside buffer
	Maintain habitat connectivity	Establish buffers zones for: <ul style="list-style-type: none"> undisturbed habitats. Tracks situated to avoid undisturbed habitat.	0 = new track likely to fragment tracts of vegetation 1 = new track within undisturbed vegetation, but on edge so only edge effect 2 = existing track causing fragmentation 3 = existing track with edge effect

Indices	Desired outcome	Benchmark principles	Score
			5 = outside undisturbed habitat
	Avoid soil erosion	Tracks should be located to avoid erosional soils.	1 = track within erosional zone and steep topography 2/3 = track within erosional zones 5 = track outside erosional soils
	Avoid damaging watercourses, wetlands and waterbodies	Establish buffers zones for: <ul style="list-style-type: none"> • 1st & 2nd order watercourses • 3rd order watercourses • 4th order and above. Tracks situated to avoid upland, fresh and saline swamps or wetlands.	1 = track inside 3rd order or above or swamp/freshwater wetland 2 = inside buffer on 1st or 2nd order 3/4 = multiple crossing required 5 = not within buffer and no crossing required
			<p>Criterion 1 score = x/40 (Divide by 8 to convert to score out of 5) Benchmark score = y/5</p>

Note: Individual park circumstances may vary and criteria can be adjusted accordingly.

Table 10 Criterion 2 – Routes facilitate an enjoyable and safe visitor experience

Indices	Desired outcome	Benchmark principles	Score
Track suitability	Ensure track durability	Capacity of tracks to sustain ride traffic and condition.	1 = very poor (alignment and construction poor) 2 = poor (not conducive to sustainable track) 3 = average (some sections poorly aligned and/or constructed) 4 = good (offers good level of long-term sustainability) 5 = excellent (track offers best level of long-term sustainability)
	Ensure emergency access	Capacity to access tracks for ease of emergency or medical evacuation including response time as well as road, trail and air accessibility.	1 = very limited (no emergency access by road or foot) 2 = limited (limited emergency access but time critical requires air) 3 = moderate (reasonable level of access, 4WD and/or short hike) 4 = high (good level of access, 2WD or short hike) 5 = very high (located close to main road, direct 2WD vehicle access)
	Maintain track over a long lifecycle	Capacity of the tracks to be sustained in the long term, assesses maintenance costs including accessibility, soil and climatic factors .	1 = very poor (track poorly sited, beyond practical repair, and costly to upkeep) 2 = poor (poorly sited and requires significant upgrades, upkeep costly) 3 = average (general sound alignment, but remediation/realignments required) 4 = good (good alignment, minor repairs and remediation required) 5 = excellent (designed and built to best practice IMBA guidelines)
User experience	Provide quality ride experiences	Capacity of tracks to provide high quality ride experiences .	1 = very poor (flow/dynamics are very poor causing very low quality experience) 2 = poor (low quality ride experience) 3 = average (some quality riding experiences but not particularly high standard) 4 = good (predominantly quality riding experience, some work required) 5 = excellent (track offers very high quality ride experience)
	Provide enjoyable environmental experiences	Capacity of tracks to offer a diversity of aesthetic and environmental experiences (diversity of plant communities, viewpoints,	1 = very poor (little to no positive qualities e.g. powerline easement, weeds) 2 = poor (generally poor environmental experience) 3 = average (unremarkable landscape, few features of interest)

Indices	Desired outcome	Benchmark principles	Score
		waterways and other related environmental experiences).	4 = good (range of environmental attributes) 5 = excellent (offers memorable riding experiences, sense of remoteness)
Social value	Maintain market appeal	Capacity of tracks to cater for a broad market of riders .	1 = very limited (track doesn't offer experience that is widely sort after) 2 = limited (limited attributes desirable to market) 3 = moderate (moderate level of appeal to market) 4 = high (offers significant value to network with range of desirable attributed) 5 = very high (track is of highest importance to network)
	Provide connected networks	Capacity of the tracks to link with a broader network and ensure importance to the network.	1 = very limited connectivity to network or transport (closure and rehabilitation recommended) 2 = limited connectivity to network or transport (closure and rehabilitation may be warranted) 3 = moderate connectivity (some value to network, inclusion should be explored) 4 = high connectivity (track is of significant value to network) 5 = very high connectivity (track essential to network and or connects to transport)
	Minimises user conflict	Capacity of the tracks to impact on the social values of the park or location, considering other user groups, adjoining landownership and uses.	1 = very poor (located close to neighbours or adversely impacts other users) 2 = poor (adversely impacts other users or residents) 3 = average (user conflict may arise, track not categorised as multi-use or single-use) 4 = good (track located away from neighbours, multi-use and no conflict) 5 = excellent (track clearly defined for purpose and doesn't adversely impact residents or other users)
			Criterion 2 score = x/40 (Divide by 8 to convert to score out of 5) Benchmark score = y/5

Note: Individual park circumstances may vary, and criteria can be adjusted accordingly.

Table 11 Criterion 3: Construction and maintenance costs are reasonable and sustainable

		Cost required to bring track up to standard (for existing track) or to construct track (for proposed track)			
		under \$5,000	\$5,000–10,000	\$15,000–20,000	over \$20,000
Maintenance costs/km/annum	<\$1,000	5	4	3	3
	\$1,000–5,000	5	3	2	2
	\$5,000–10,000	3	2	2	1
	>\$15,000	2	2	1	1

The figures used in Table 6 are provided as an example only. Costs will vary depending on the length of a track, number of tracks, technical features and environmental factors such as the soil type. Estimates of costs should be calculated on a case-by-case basis. Associated track head costs may be added. Potential or dedicated funding for particular experiences may also alter the matrix.

Criterion 3 benchmark score = y/5

Appendix B Track difficulty ratings

The following track difficulty ratings from *Trail difficulty rating system* (Australian Mountain Bike 2020) will be adopted in Glenrock SCA. The rating system enables visitors to understand the nature of the track before beginning their ride, planning for level of challenge, enjoyment and safety.

These ratings are proposed to be communicated through on-park signage and overtime included on the NPWS Glenrock NPWS webpage with other relevant track network.

<i>Difficulty Symbol</i>	<i>Short Description</i>
	<p>Very easy Wide trail with a gentle gradient smooth surface and no obstacles Suitable for beginner cyclists with basic bike skills, and most bikes</p>
	<p>Easy Wide trail with a gentle gradient smooth surface Some obstacles such as roots, logs and rocks Suitable for beginner cyclists with basic mountain bike skills, and off-road bikes</p>
	<p>Easy with Intermediate Sections Likely to be single track with a moderate gradient, variable surface and some obstacles Some obstacles such as roots, logs and rocks Suitable for mountain bikers with mountain bikes</p>
	<p>Intermediate Single trail with moderate gradients, variable surface and obstacles May include steep sections Suitable for skilled mountain bikers with mountain bikes</p>
	<p>Intermediate with Difficult Sections Suitable for competent mountain bikers, used to physically demanding routes Expect large and unavoidable obstacles and features Challenging and variable with some steep climbs or descents and loose surfaces</p>
	<p>Difficult Suitable for experienced mountain bikers, used to physically demanding routes Navigation and personal survival skills are highly desirable Expect large, dangerous and unavoidable obstacles and features Challenging and variable with long steep climbs or descents and loose surfaces Some sections will be easier to walk</p>
	<p>Extreme Suitable for highly experienced mountain bikers, used to physically demanding routes Navigation and personal survival skills are highly desirable Severe constructed trails and/ or natural features, all sections are challenging Includes extreme levels of exposure and / or risk Expect large and unavoidable obstacles and features Some sections will be easier to walk</p>

Figure 9 Trail difficulty rating system

Appendix C Rules of the trail

IMBA developed the *Rules of the Trail* (IMBA n.d.) to promote responsible and courteous conduct on shared-use trails. The rules are provided as a general, internationally recognised code of conduct. These rules may be nuanced by a locally formed code of conduct developed by NPWS in consultation with users of Glenrock SCA in the future.

The rules of the tracks in Glenrock SCA, with regards to flow direction, use type and permissibility will be defined on site, through signage. A 'no sign – no ride' principle applies in this park.

The term 'trail' used below is considered to be equivalent to the NPWS term 'tracks' and may equally be applied to NPWS 'management trails'. Refer to Box 1 of this document for a definition of terms used in NPWS reserves.

1. Ride on open trails only

Respect trail and road closures (ask if uncertain); avoid trespassing on private land; obtain permits or other authorisation as may be required. The way you ride will influence trail management decisions and policies.

2. Leave no trace

Be sensitive to the dirt beneath you. Recognise different types of soils and trail construction; practice low-impact cycling. Wet and muddy trails are more vulnerable to damage. When the trail bed is soft, consider other riding options. This also means staying on existing trails and not creating new ones. Don't cut switchbacks. Be sure to pack out at least as much as you pack in.

3. Control your bicycle

Inattention for even a second can cause problems. Obey all bicycle speed regulations and recommendations.

4. Always yield trail

Let your fellow trail users know you're coming. A friendly greeting or bell is considerate and works well; don't startle others. Show your respect when passing by slowing to a walking pace or even stopping.

Anticipate other trail users around corners or in blind spots. Yielding means slow down, establish communication, be prepared to stop if necessary and pass safely.

5. Never scare animals

All animals are startled by an unannounced approach, a sudden movement, or a loud noise. This can be dangerous for you, others and the animals. Give animals extra room and time to adjust to you. When passing horses, use special care and follow directions from the horseback riders (ask if uncertain).

Disturbing wildlife is a serious offence. Leave gates as you found them or as marked.

6. Plan ahead

Know your equipment, your ability, and the area in which you are riding – and prepare accordingly. Be self-sufficient at all times, keep your equipment in good repair, and carry necessary supplies for changes in weather or other conditions. A well-executed trip is a satisfaction to you and not a burden to others.

Always wear a helmet and appropriate safety gear. Keep trails open by setting a good example of environmentally sound and socially responsible off-road cycling.

References

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MTBA (Mountain Bike Australia) (2019) [Australian mountain bike trail guidelines](#), Mountain Bike Australia (now AusCycling), available through the [AusCycling website](#).

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NPWS (2022a) '[Glenrock State Conservation Area draft plan of management](#)', Department of Planning and Environment, Parramatta.

NPWS (2022b) '[Glenrock State Conservation Area draft planning considerations](#)', Department of Planning and Environment, Parramatta.

OEH (Office of Environment and Heritage, NSW) (2011) '[Sustainable Mountain Biking Strategy](#)', OEH, Sydney.

More information

- [Australian Mountain bike trail guidelines](#)
- [Glenrock State Conservation Area Draft Plan of Management](#)
- [Glenrock State Conservation Area Draft Planning Considerations](#)
- [NPWS park policies](#)