

Housing the Hunter: a plan for renewal at Broadmeadow

Preferred scenario technical report - biodiversity and bushfire

Prepared for Department of Planning, Housing and Infrastructure

May 2024

Housing the Hunter: a plan for renewal at

Broadmeadow

Preferred scenario technical report - biodiversity and bushfire

Department of Planning, Housing and Infrastructure

E230023 RP4

May 2024

Version	Date	Prepared by	Reviewed by	Comments
1	18 December 2023	Cecilia Phu	Katie Teyhan	Draft for client review
2	27 February 2024	Cecilia Phu	Katie Teyhan	Second draft
3	15 May 2024	Cecilia Phu	Katie Teyhan	Final

Approved by

MyC

Katie Teyhan Associate Acoustics Consultant 15 May 2024

Level 3 175 Scott Street Newcastle NSW 2300

This report has been prepared in accordance with the brief provided by Department of Planning, Housing and Infrastructure and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of Department of Planning, Housing and Infrastructure and no responsibility will be taken for its use by other parties. Department of Planning, Housing and Infrastructure may, at its discretion, use the report to inform regulators and the public.

© Reproduction of this report for educational or other non-commercial purposes is authorised without prior written permission from EMM provided the source is fully acknowledged. Reproduction of this report for resale or other commercial purposes is prohibited without EMM's prior written permission.

TABLE OF CONTENTS

1	Introduction				
2	Existi	Existing environment			
3	Emer	Emerging preferred scenario			
4	SWOT – preferred scenario				
	4.1	Strengths	6		
	4.2	Weaknesses	6		
	4.3	Opportunities	6		
	4.4	Threats	7		
5	First-r	nove considerations	8		
6	Other	considerations	9		
	6.1	Alternative planning framework	9		
	6.2	Strategic Planning and Bushfire Prone Vegetation	9		
	6.3	Planning and approval requirements	10		
	6.4	Staged changes to land use	11		
	6.5	Proposed flood mitigation	12		
7	Summary of findings		13		
Ref	erence	S	15		
Tab	oles				
Tab	le 2.1	Summary of biodiversity values within and near the precinct	3		
Fig	ures				
Figu	ire 1.1	Housing the Hunter - local context (COX 2023)	2		
Figu	ire 3.1	Emerging preferred scenario	5		

Figure 6.1Staged land use planning of the project11Figure 6.2Preliminary draft flood mitigation measures12

First-move state-led rezoning

Figure 5.1

8

1 Introduction

EMM Consulting Pty Limited (EMM) has been commissioned by the New South Wales (NSW) Government Department of Planning, Housing and Infrastructure (DPHI) to support the development of a Structure Plan for the Broadmeadow Regionally Significant Growth Area (Broadmeadow). The Structure Plan will be informed by a Place Strategy and several technical studies.

The project, referred to as 'Housing the Hunter: a plan for renewal at Broadmeadow' focuses on the preparation of a Place Strategy and subsequent first-move state-led rezoning for a minimum of 2,000 homes on governmentowned land. Housing the Hunter focuses on the efficient use of land to deliver residential and employment benefits with established services and infrastructure. There is potential for Broadmeadow to be an employment and residential centre that capitalises on transport options, Hunter Park, advanced manufacturing, sports medicine, and creative industries. The Broadmeadow precinct area is shown in a local context in Figure 1.1 (as 'Precinct boundary').

This report has been prepared to support the Structure Plan. EMM's role was to provide technical input with respect to Package B – Environmental. This report addresses the technical areas of biodiversity and bushfire. Noise, vibration, air quality and odour advice, also provided by EMM, is addressed in a separate report.

An initial Enquiry by Design (EbD) workshop was held in Newcastle on 3–4 May 2023. An outcome of the workshop was the Reimagining Broadmeadow Draft Scenarios Report which presented three scenarios for development within Broadmeadow (COX 2023). This report identified the following objectives relating to bushfire or biodiversity impacts:

- Styx Creek will progress towards a more natural appearance, introducing greater greenery
- biodiversity is improved with drought-tolerant vegetation
- the local climate will be cooled through increased tree canopy.

The scenarios provided in the Draft Scenarios Report were updated and refined during and after a final EbD workshop held in Newcastle on 11–12 October 2023. From this workshop, an 'emerging preferred scenario' was developed and provided for assessment to the technical specialists.

It is noted that school infrastructure and transport initiatives are indicative only and subject to detailed design, analysis, feasibility review, funding commitments, etc. No investment decisions have been made in this regard.

This report presents an analysis of the emerging preferred scenario and first-move state-led rezoning in relation to potential bushfire and biodiversity impacts as a result of the proposed changes to land use. This analysis also includes recommendations relating to how potential impacts could be avoided and managed in the future.



Figure 1.1 Housing the Hunter - local context (COX 2023)

2 Existing environment

The natural environment within the precinct boundary is largely unconstrained by biodiversity values or by bushfire risks. The natural environment within precinct boundary has been highly modified and reflects the current use of the area for industry, sporting and entertainment, business and low-density residential.

Much of the extant vegetation within the precinct boundary represents urban mixed exotic/native plantings, turf, weeds and exotic groundcovers. The most prominent natural feature within the precinct boundary, Styx Creek, is a concrete channel conveying stormwater and lacks instream and riparian vegetation.

Despite the above, the precinct is situated within a broader context of coastal values that includes threatened wetland vegetation communities, State Environmental Planning Policy (SEPP) coastal wetland, nationally important wetland, Key Fish Habitat, and important habitat areas for migratory shorebirds and Grey-headed Flying-fox camps (Table 2.1). Many of these are overlapping values associated with the Throsby Creek system and further downstream, the Hunter River.

Styx Creek is a prominent feature within the precinct boundary and represents a direct connection to off-site (including downstream) values. Styx Creek therefore presents an opportunity to improve the catchment values within the precinct, create flora and fauna habitat, as well as improve the quality of the wetland values downstream.

Values	Occurrence in the landscape
Vegetation	Urban native/exotic vegetation, weeds, turf. No vegetation of conservation significance. Vegetation of conservation significance occurs downstream of Styx Creek and comprises wetland vegetation (including estuarine macrophytes) in association with Styx and Throsby Creeks, and swamp forest vegetation on the margins of urban open spaces.
Flora and fauna	Threatened species recorded within the precinct boundary are limited to fauna species that are highly mobile and have large home ranges; and there are no threatened plant records known from the precinct. The most frequently recorded species is Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>). There are two nationally important camps outside of the precinct, one to the east at Carrington and one to the west at Blackbutt Reserve, New Lambton. It is likely that the species utilises any foraging resources (i.e. flowering trees, etc.) within the precinct as part of a broader foraging range to support the camps, especially during critical life stages such as breeding and raising young. Further to the east of the precinct, White-bellied Sea-Eagle (<i>Haliaeetus leucogaster</i>) records are also comparatively high and are likely to be associated with the Hunter River environment. White-bellied Sea-Eagle are known to breed up to 1 km away from rivers, lakes and coastlines in large old trees. Threatened fish, threatened amphibians and other wetland specialists are unlikely to occur within the precinct boundary but do occur downstream of the precinct. The development of the precinct could affect sensitive downstream receivers, which includes areas identified as important habitats for migratory shorebirds protected under international agreements.
Coastal wetlands	The watercourses downstream of Styx Creek as it exits the precinct are identified as Key Fish Habitat as established under the <i>Fisheries Management Act 1994</i> (FM Act). Other than this, there are no significant wetlands within the precinct boundary. It is noteworthy that a number of wetland values are identified downstream of the precinct. A small area of Coastal Wetland as mapped under the State Environmental Planning Policy (Resilience and Hazards) 2021 occurs along Throsby Creek downstream of the precinct. This area supports a nationally important camp of Grey-headed Flying-fox. Koorangang Nature Reserve (NSW080) is a nationally important wetland listed in the Directory of Important Wetlands of Australia (DIWA). It occurs downstream of the precinct boundary generally from Carrington to the Hunter River confluence. The Koorangang Nature Reserve is recognised as a representative example of ecologically diverse wetland types including mangrove, saltmarsh, seagrass and swamp forests.

Table 2.1 Summary of biodiversity values within and near the precinct

Table 2.1Summary of biodiversity values within and near the precinct

Values	Occurrence in the landscape
	Other significant wetlands that occur in the broader area include the Ramsar-listed Hunter Estuary Wetlands to the north; however, this is part of a separate catchment that also flows into the Hunter River.

3 Emerging preferred scenario

An initial Enquiry by Design (EbD) workshop was held in Newcastle on 3–4 May 2023. An outcome of the workshop was the Reimagining Broadmeadow Draft Scenarios Report which presented three scenarios for development within Broadmeadow (COX 2023). A range of technical specialists attended the workshop to provide advice on potential impacts as a result of the proposed land use changes.

This information was then reviewed and used to inform updated scenarios analysed at a final EbD workshop held in Newcastle on 11–12 October 2023. From this workshop, the emerging preferred scenario was developed and is the subject of the analysis provided in this report.

The emerging preferred scenario is the outcome of the EbD workshops and aims to achieve the vision and nonnegotiable planning features established through the workshops.



Figure 3.1 Emerging preferred scenario

4 SWOT – preferred scenario

The following sections provide a summary of the strengths, weaknesses, opportunities, and threats of the preferred scenario as they relate to maintaining and improving biodiversity values and bushfire management.

4.1 Strengths

- The open / recreational space along Styx Creek provides opportunities for improvement in visual amenity values for high-density residential users along Broadmeadow Road.
- The open / recreational space along Styx Creek has some function as linear parklands and retention basins that can support natural biodiversity and habitat functions such as hydrology management, pollution filtration, fauna corridor and feed resource.
- Strategic planning for biodiversity areas and parklands design can be afforded to maintain the bushfire risk to its current level or introduce design principles that mitigate potential risk toward life, safety and existing or future assets.
- The biodiversity area is an isolated zone located next to employment and urban services land that makes it easier to manage public access. Restricted access allows for natural lifecycles and higher fuel loads to develop and is capable for bushfire landscape management such that it will not directly impact residential zones (i.e. no direct impacts to life, safety, and infrastructure).

4.2 Weaknesses

- The open / recreational space along Styx Creek consists of relatively separate smaller green spaces with limited opportunity for connections between them. Larger and connected vegetation parcels can have more resilient and beneficial ecosystem functions than multiple smaller vegetation parcels.
- Revegetation will require the preparation of a Plan of Management for vegetation parcels, and regular and frequent maintenance work to prescribed standards (additional information in this regard is provided in Section 6.2.2 of this report).
- There may be issues of access to the potential biodiversity area to undertake vegetation management works (i.e. active rail traffic to be managed including need for protection officers and site management plans, Rail Industry Worker (RIW) inductions, and possibly rail possession, etc.)

4.3 Opportunities

- There is opportunity to naturalise Styx Creek, which would improve the catchment values within the precinct, create flora and fauna habitat, as well as improve the quality of the wetland values downstream.
- Opportunities exist for the Hamilton Railway Junction to support additional reinstated native habitat. The value of such reinstated habitat could be investigated in future for its potential to generate biodiversity credits to formally offset (under the *Biodiversity Conservation Act 2016*) any future state development projects, provided it remains inaccessible to the public.
- The strategic planning of biodiversity areas can demonstrate overall biodiversity gains and provide for biodiversity offsetting that could be required through potential environmental impacts associated with redevelopment of the Broadmeadow precinct.

- The Hamilton Railway Junction is a potential key biodiversity area. This area could be recreated as wetland as it is appropriately located at the upper headwaters of the Throsby Creek (Styx Creek a tributary to Throsby Creek).
- The biodiversity considerations could extend to introduction of best practice 'urban greening' and 'urban cooling' (example DRAFT Launceston Urban Greening Strategy 2023-2040).
- The revegetation planning, management, maintenance and monitoring provides for multiple natural resource management employment opportunities.
- The revegetation and land use planning provides for environmental awareness, and social health and wellbeing opportunities.
- Urban vegetation (landscaping and urban tree canopy requirements) can be designed as low threat bushfire vegetation (as detailed in the NSW RFS Planning for Bushfire 2019 (chapter A1.10, pp88)), such that it would not create a significant bushfire risk and would not need to be mapped as Bush Fire Prone Land. Vegetation structure and parcel size and shape can be designed to meet low threat vegetation criteria. Hence, it would not affect development potential.

4.4 Threats

- Although the precinct does not currently have any mapped bushfire prone vegetation, the introduction of native vegetation for biodiversity gains in the biodiversity area has potential to create a bushfire risk.
- The revegetation of the biodiversity area (in the long term) has potential to cause hazards and constraints to future development potential.

5 First-move considerations

The plan for the first-move state-led rezoning (see Figure 5.1) has been reviewed. There are no key constraints from a biodiversity or bushfire perspective to prevent or delay the rezoning of the Newcastle Showground site, Basketball Stadium and PCYC site, Locomotive Depot site or Go Karts and Stadium Forecourt site.

The potential construction and future-use impacts of these first-move sites beyond rezoning would need to be duly assessed at development application stage as part of the planning assessment process and would need to consider off-site impacts such as run-off into Styx Creek and downstream receivers. However, it is expected that such impacts can be appropriately and satisfactorily addressed through design and construction measures.

Biodiversity certification under the *Biodiversity Conservation Act 2016* can be undertaken at rezoning stage and offers a streamlined assessment process for development applications. It is discussed in more detail in Section 6.3.1 in relation to the rezoning of the entire precinct. Where land is certified, development can proceed without site-by-site biodiversity assessment at future development application stages.

With respect to the state-led rezoning of the first-move sites, DPHI may wish to weigh the benefits of certification (which may take time and require approval from the Department of Climate Change, Energy, the Environment and Water, or DCCEEW NSW) against an aggressive program required to realise the objectives of the first-move rezoning. Regardless of whether certification is pursued for first-move state-led rezoning or not, this does not preclude certification of the remainder of the precinct for future planning proposals.





6 Other considerations

6.1 Alternative planning framework

With the ongoing use and evolution of the site, there is an opportunity to investigate the feasibility and practicality of implementing relevant planning framework that incorporates the concept of a 'Protecting Environmental Values' (or similar) and managing 'Urban Heat Exchange' to manage expectations around climate change resilience and urban design principles.

6.2 Strategic Planning and Bushfire Prone Vegetation

The NSW planning guide *Planning for Bushfire Protection 2019* (PBP) (NSW RFS 2019) provides development standards for design and building on bushfire prone land in NSW. The guide details bushfire prone land mapping requirements and consequential strategic planning requirements to ensure that businesses and future development are not exposed to an unacceptable risk of bushfire.

The biodiversity planning for the Broadmeadow precinct must consider the potential for creating bushfire prone land in an area which currently does not have any mapped bushfire prone vegetation. At this strategic planning stage, high-level bushfire considerations are:

- Bushfire Prone Land mapping considerations
- vegetation design and performance (for biodiversity and/or landscaping).

This is discussed in further detail in the following sections. Design measures for vegetation to avoid creating Bushfire Prone Land is discussed in Section 6.2.2.

6.2.1 Bushfire Prone Land

An acceptable strategic planning objective would have early influence on long term design and landscaping management for vegetation re-establishment such that it would not create a significant bushfire risk and would not need to be mapped in future City of Newcastle Bush Fire Prone Land mapping updates.

Chapter 2.2 of PBP (NSW RFS 2019) describes Bush Fire Prone Land mapping as:

The identification of BFPL in NSW is required under the EP&A Act s.10.3. BFPL Maps provide the trigger for the various development assessment provisions.

The Commissioner of the NSW RFS designates what constitutes BFPL and how it is to be mapped. Each council prepares a map in accordance with the guidelines and submits the map to the NSW RFS for certification by the Commissioner. These maps are required to be recertified at least every five years and the Commissioner may make direct changes to a BFPL Map at any time.

Guidelines for the mapping of BFPL can be found on the NSW RFS website (NSW RFS, 2015).

A site is mapped as being bush fire prone by referring to the BFPL Map which is held by the local council, or on the NSW RFS website.

The BFPL Map is a trigger for the consideration of new development. It is not intended as a detailed measure of risk.

6.2.2 Vegetation design and performance

The concept design and Plan of Management for any landscaping and/or biodiversity areas will ensure the final vegetation areas can be deemed a 'low threat vegetation' and excluded from further bushfire analysis (consistent with PBP Chapter A1.10). Below are preferred vegetation type and terminology that can be applied:

Modified landscapes, coastal wetlands and riparian areas vary significantly in structure and composition, but are generally considered as bush fire hazards, with the exception of saline wetlands. The following exclusions of AS 3959 apply, and are not required to be considered for the purposes of PBP, as detailed below:

- **Single areas of vegetation less than 1 hectare** in area and greater than 100 metres separation from other areas of Category 1 or 2 vegetation.

- Multiple areas of vegetation less than 0.25 hectares in area and not within 20m of the site, or each other or of other areas of vegetation being classified vegetation.

- Strips of vegetation less than 20 metres in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m of the site (development site) or to each other, or other areas of vegetation being Category 1, 2 or 3 vegetation.

- Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load, including grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses such as playing areas and fairways, **maintained public reserves and parklands**, sporting fields, vineyards, orchards, banana plantations, market gardens and other non-curing crops, cultivated gardens, **arboretums**, commercial nurseries, **nature strips** and windbreaks.

6.3 Planning and approval requirements

Future development approval will need to meet the requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act), the *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Most contemporary biodiversity assessments for development applications are completed in accordance with the Biodiversity Assessment Method (BAM); key assessment and approval considerations in relation to biodiversity include delivering the 'avoid and mitigate' hierarchy.

Many of the planning thresholds that would trigger specific planning/assessment requirements are not triggered for the precinct. However, these thresholds overlap downstream (and within proximity) of the precinct and this indicates a need to consider off-site values. As there are few constraints within the precinct itself, the focus of the avoid and mitigate hierarchy is likely to be on minimising impacts off-site (mainly downstream of the site).

6.3.1 Biodiversity certification

The first-move sites are proposed to be rezoned, and this includes the Newcastle Showground site, Basketball Stadium and PCYC site, Locomotive Depot site or Go Karts and Stadium Forecourt site. The remainder of the precinct will be rezoned under the standard Planning Proposal process to be consistent with the Structure Plan and the Place Strategy.

Biodiversity certification offers a streamlined assessment process for parcels of land proposed for future development. The biodiversity certification process identifies developable areas as well as measures to offset the impacts of development. Where land is certified, development can proceed without site-by-site biodiversity assessment at future development application stages.

Biodiversity certification is applied during early planning of land use change (i.e. rezoning) and encourages the application of 'avoid and minimise' principles on a whole-of-site basis rather than on a site-by-site basis, resulting in better biodiversity outcomes. Since certified land does not require site-by-site biodiversity assessment, biodiversity certification also provides upfront certainty regarding development and conservation outcomes for an area. For these reasons, biodiversity certification is particularly suitable at the strategic land use planning stage.

However, whilst biodiversity certification streamlines biodiversity assessment under the BC Act, it does not turn off the requirements for assessment of biodiversity under the EPBC Act, which means that future development applications will require formal assessment of EPBC Act matters.

6.4 Staged changes to land use

The plan for the staged changes to land use (see Figure 6.1) has been reviewed. It is not anticipated that there would be any additional considerations relating to biodiversity or bushfire as a result of the proposed staging plan.



Figure 6.1 Staged land use planning of the project

6.5 Proposed flood mitigation

Preliminary flood mitigation measures in the form of retention basins in and around the site are shown in Figure 6.2. These are not expected to have any direct implications with regard to the control and management of bushfire risk and biodiversity but could provide an opportunity to improve the quality of the water exiting downstream.



Figure 6.2 Preliminary draft flood mitigation measures

7 Summary of findings

EMM has provided an evaluation of the emerging preferred scenario and the first-move state-led rezoning as it relates to potential biodiversity and bushfire impacts.

- The precinct is largely unconstrained by biodiversity values. However, it is situated within an area that includes threatened wetland vegetation communities, SEPP coastal wetland, nationally important wetland, Key Fish Habitat, and important habitat areas for migratory shorebirds and Grey-headed Flying-fox camps primarily associated with the Throsby Creek system and the Hunter River. There will be a need to consider off-site values.
- The overall principle that should be applied to the project is to protect / enhance the downstream biodiversity values. The naturalisation of Styx Creek, where possible, presents an opportunity to improve the catchment values within the precinct, create flora and fauna habitat, as well as improve the quality of the wetland values downstream.
- Larger and connected vegetation parcels can have more resilient and beneficial ecosystem functions than multiple smaller vegetation parcels. The preferred scenario is primarily made up of separate smaller green spaces with limited opportunity for connections between them.
- Urban vegetation (landscaping and urban tree canopy requirements) can be designed as low threat bushfire vegetation (as detailed in the NSW RFS Planning for Bushfire 2019 (chapter A1.10, pp88)), such that it would not create a significant bushfire risk and would not need to be mapped as Bush Fire Prone Land. Vegetation structure and parcel size and shape can be designed to meet low threat vegetation criteria. Hence, it would not affect development potential.
- Vegetation areas will require a Plan of Management (PoM) to be adopted by Council, and ongoing and perpetual maintenance.
- Regarding the potential biodiversity area:
 - development within 100 m of the wetland biodiversity area will need to consider bushfire protection measures as detailed in the NSW RFS Planning for Bushfire 2019 (NSW RFS 2019)
 - the biodiversity area will require ongoing fire management (hazard reduction burns or clearing / maintenance around the perimeter)
 - there are major physical (and potential safety) constraints due to active railway through the proposed biodiversity area.
- Opportunities to introduce relevant planning framework that incorporates the following to manage expectations around climate change resilience and urban design principles:
 - best practice 'urban greening' and 'urban cooling' concepts
 - Green Plant Initiative 2050, tiny forest concepts to restore native vegetation
 - Protecting Environmental Values (or similar)
 - Urban Heat Exchange.

- The proposed draft flood mitigation measures (retention basins) could provide an opportunity to improve the quality of the water exiting downstream but will likely have limited impact on the recommendations and outcomes of the biodiversity and bushfire studies.
- There are no key constraints from a biodiversity or bushfire perspective to prevent or delay the rezoning of the first-move sites, being the Newcastle Showground site, Basketball Stadium and PCYC site, Locomotive Depot site or Go Karts and Stadium Forecourt site.
- The proposed staging of the project will have negligible impact on the recommendations and outcomes regarding the biodiversity and bushfire studies.

References

- COX. 2023. "Reimagining Broadmeadow Package A Integrated Place Analysis and Baseline Report." COX Architecture.
- NSW RFS. 2019. Planning for Bushfire Protection. State of New South Wales, NSW Rural Fire Service.
- NSW RFS,. 2015. *Guide for bushfire prone land mapping version 5b.* State of New South Wales, NSW Rural Fire Service.

Australia

SYDNEY Ground floor, 20 Chandos Street St Leonards NSW 2065 T 02 9493 9500

NEWCASTLE Level 3, 175 Scott Street Newcastle NSW 2300 T 02 4907 4800

BRISBANE Level 1, 87 Wickham Terrace Spring Hill QLD 4000 T 07 3648 1200

CANBERRA Level 2, Suite 2.04

15 London Circuit Canberra City ACT 2601 ADELAIDE Level 4, 74 Pirie Street Adelaide SA 5000 T 08 8232 2253

MELBOURNE 188 Normanby Road Southbank VIC 3006

PERTH Level 9, Suite 9.02 109 St Georges Terrace Perth WA 6831

Canada

TORONTO 2345 Yonge Street, Suite 300 Toronto ON M4P 2E5

VANCOUVER 60 W 6th Ave Suite 200 Vancouver BC V5Y 1K1





emmconsulting.com.au