



PEER REVIEW OF THE
NORTHERN BEACHES COUNCIL
BIODIVERSITY PLANNING
REVIEW 2021

PREPARED BY ECONPLAN
2 MARCH 2022
www.econplan.com.au



Isabelle Connolly

Table of Contents

1.0	BACKGROUND	1
1.1	EConPlan – the Peer Reviewer	2
1.2	Scope of the Peer Review	2
1.2	Methodology	3
2.0	THE ASSESSMENT	3
2.1	Draft Biodiversity Planning Review report	3
2.2	Sydney Green Grid, Plan 6, North District	6
2.3	North District Plan – Our Greater Sydney 2056	8
2.4	Draft GANSW Greener Places Design Guide (Issue no. 04 - 2020)	10
2.5	Northern Beaches Local Strategic Planning Statement (LSPS)	17
2.6	Northern Beaches Bushland & Biodiversity Policy (2021)	24
2.7	Relevance and utility to inform a new Northern Beaches LEP and DCP	27
3.0	CONCLUSION	30
	REFERENCES	32
	APPENDIX 1 NORTHERN BEACHES COUNCIL BIODIVERSITY PLANNING METHODOLOGY REVIEW BY ECONPLAN, 6 AUGUST 2019	1

1.0 Background

EConPlan was commissioned by Northern Beaches Council to peer review the draft *Biodiversity Planning Review* report and maps Ref No. 30012906 dated 2 November 2021 prepared by SMEC.

In 2019 Northern Beaches Council engaged SMEC to prepare the Northern Beaches Council Biodiversity Planning Review. The document and associated maps were to inform the review of its planning instruments, particularly the development of Council's new integrated Local Environmental Plan and Development Control Plan to better protect native flora and fauna, wildlife habitat, connectivity and threatened entities. Threatened entities comprise threatened species, threatened ecological communities and threatened populations listed under the NSW *Biodiversity Conservation Act 2016* and / or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

In the initial stages of the project in 2019, Council engaged the services of EConPlan and Keystone Ecological to review and comment on the draft methodology of the Biodiversity Planning Review and mapping in the context of its intended application in Local Government planning processes.

The draft version of the report dated 2 November 2021 is now at the peer review stage. Council is seeking services to undertake an evaluation of the draft report and mapping in the context of its intended application to inform the following:

Local Environmental Plan

- The identification of potential 'Conservation Zones'
- LEP Biodiversity Map and controls

Development Control Plan

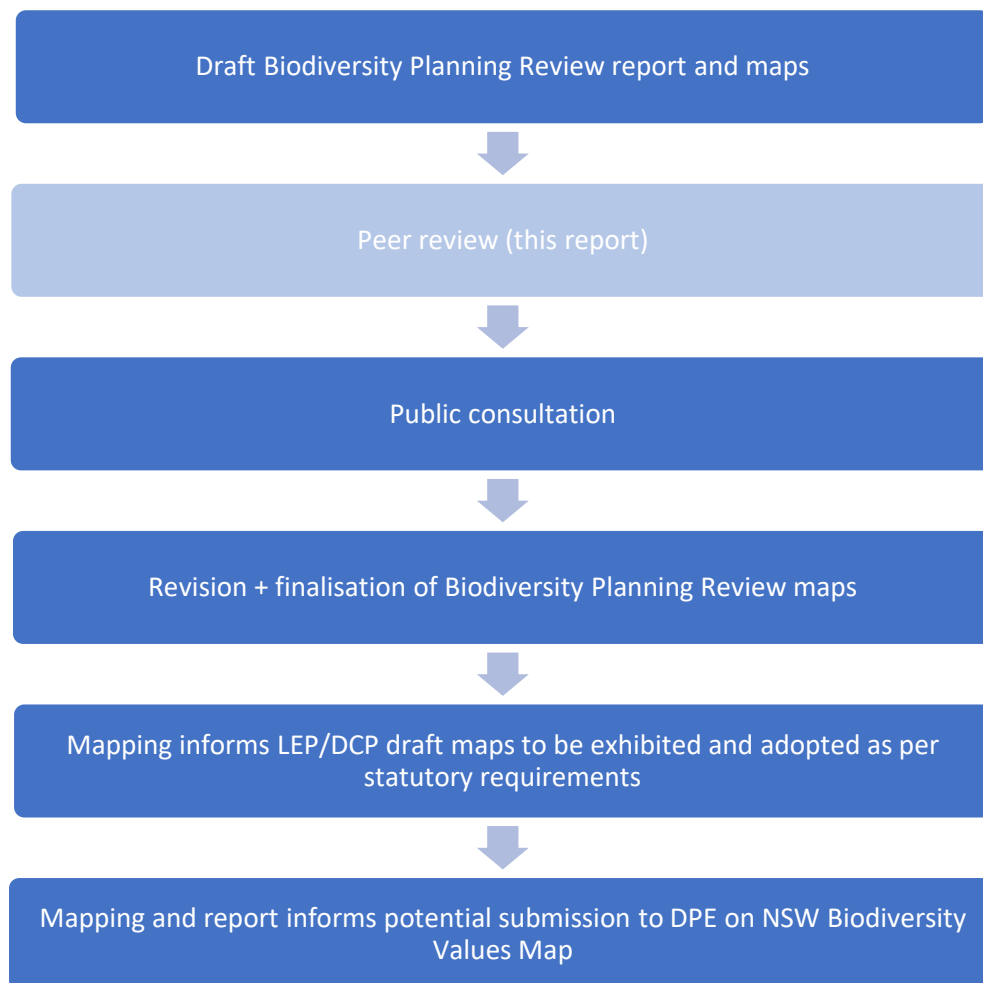
- Development controls and map layers of:
 - Biodiversity (wildlife) corridors
 - Core habitat
 - Threatened Species and Ecological Communities
 - Native Vegetation (prepared separately to the Biodiversity Planning Review)

Submission to the Department of Planning and Environment

- Submission of updated mapping to inform consultation and potential local revisions of the NSW Biodiversity Values Map.

Figure 1 below indicates the stepped process for finalisation and implementation of the draft Biodiversity Planning Review report and maps by SMEC and where the peer review fits into the process.

Figure 1: Process for implementation of the draft *Biodiversity Planning Review* report and maps by SMEC



1.1 EConPlan – the Peer Reviewer

EConPlan is an environmental consultancy based in Sydney with expertise in park planning, conservation, environmental management, and strategic planning for sustainable outcomes. The company primarily focuses on assisting all levels of government with green infrastructure and estate management that involves conserving or enhancing areas with natural and cultural heritage and recreation values. EConPlan provides advice on land use planning, urban canopy and biodiversity strategies, environmental impact assessment and land capability analysis, plans of management, bush regeneration, environmental management plans, strategic planning and heritage. EConPlan was commissioned by the NSW Government Architect in 2018 to assist in drafting the Bushland and Waterways section of the Draft Greener Places Design Guide. The Guide was amended in 2020 and is a key reference document in this peer review.

1.2 Scope of the Peer Review

It is understood that Northern Beaches Council is seeking an Environmental Planner's perspective to conduct a peer review and advise on:

- Relevance and consistency of the project with Sydney Green Grid, Plan 6, North District, specifically the text and maps in relation to the 'Ecological Grid' Page 196-197.
- Relevance and consistency of the project with the Sydney North District Plan, specifically Planning Priority N16 'Protecting and enhancing bushland and biodiversity'.
- Relevance and consistency of the project with biodiversity components of the Draft GANSW Greener Places Design Guide (Issue no. 04 - 2020), specifically the following sections:
 - 3 Bushland and Waterways
 - 3.3 Introducing Strategic Urban Biodiversity Frameworks
 - 3.5 Recommendations for Urban Bushland and Waterways (relevant recommendations only)
- Relevance and consistency of the project with the Northern Beaches Local Strategic Planning Statement (LSPS), specifically Priority 2 'Protected and Enhanced Bushland and Biodiversity' (pages 46 – 51).
- Consistency of the project with the Northern Beaches Bushland & Biodiversity Policy (2021).
- The relevance and utility of the draft report and map outputs for the intended purpose of informing a new Northern Beaches LEP and DCP.

1.2 Methodology

The report has been based on a desktop assessment and online meetings with Council staff. The assessment only relates to an analysis of the relevance and consistency with the policy documents listed in the scope above and application of the draft *Biodiversity Planning Review* report in relation to the NSW *Environmental Planning and Assessment Act 1979*.

2.0 The Assessment

2.1 Draft Biodiversity Planning Review report

The scope of the draft Biodiversity Planning Review report was as follows:

- *"A review of the currency and robustness of existing wildlife habitat/corridor and threatened entities mapping across the Northern Beaches Local Government Area (LGA)*
- *The identification of appropriate methodologies to update, validate and consolidate existing wildlife habitat/corridor and threatened entities (species and communities) mapping using industry standards*
- *The undertaking of recommended desktop analysis and field studies*
- *The development of consolidated and updated core habitat/biodiversity corridor and threatened entities spatial layers fit for adoption by the NBC planning instruments" (SMEC 2021 8)*

The report carried investigations to refine two consolidated and revised spatial layers:

- *"Core habitat and biodiversity corridors spatial layer*
- *Threatened entities spatial layer including threatened species (TS) and threatened ecological communities (TECs)" (SMEC 2021 8)*

The report was also meant to ensure a *"defensible and consistent result across the study area"* (SMEC 2021 8).

Table 1: Peer Review comments

Report Reference	Comment
1.5 Statutory Considerations	The <i>Local Government Act 1993</i> is relevant in relation to Council's obligations to protect natural values. The <i>Crown Land Management Act 2016</i> also indicates Council responsibilities as Crown land manager as well as the responsibilities of the Crown in relation to protecting natural values on Crown land. These legislative instruments should therefore be included in section 1.5 Statutory Considerations.
Section 2.3.2 Biodiversity Corridor Areas	<p>Creeklines were not made a 'candidate area' for a biodiversity corridor yet creeks form key biodiversity corridors in urban areas. Furthermore, the Green Grid Plan 6 report for Sydney's North proposes many projects that have hydrological values. Identifying these areas in the Biodiversity Planning Review will strengthen opportunities for funding.</p> <p>After raising this with Council, Econplan was advised on 1 March 2022 that:</p> <ul style="list-style-type: none"> the study has included and mapped all creeks within the core and wildlife corridor mapping, unless the creek's biodiversity values were compromised such as being built upon, concreted or piped. A technical study on waterways and riparian zones has just been prepared and is to be exhibited at the same time as the biodiversity planning review. Mapping from that study will also be used to inform proposed LEP / DCP controls. <p>The SMEC report is unclear in section 2.3.2.2 whether vegetation greater than 1 ha and within 100m of biodiversity corridor could include connected gardens that together form 1 ha or more of vegetation. After raising this with Council, Econplan was advised on 1 March 2022 that connected 'gardens' are included within the mapping of corridors where they are contiguous with other patches of identified biodiversity corridor.</p>
Section 3.1.2 Biodiversity Corridor Area	The ecological value of corridors should be better highlighted. Reconsider the wording of core being a regional corridor and biodiversity corridors being for local scale connectivity as biodiversity corridors are important to interconnect with core or with other biodiversity corridors and together, they all facilitate regional movement. It is acknowledged however that the approach taken in the SMEC report assists in identifying the relative importance of different sized ecological corridors.
3.1.1 Core Habitat Areas Figure 1	The NSW National Parks and Wildlife Service Estate in orange hatch should be overlaid over the core or corridor colours within the NPWS estate so it is clear council's jurisdiction in relation to the planning and approval process. The Legend should also state that the NPWS estate is Core to be consistent with the criteria used to identify and map core habitat outlined in section 2.3.1.2.
3.2.1 Threatened Ecological Communities Figure 2	The colours in the legend and map of 'Sydney Freshwater Wetlands' and 'Themeda Grassland on Seacliffs and Headlands' are so similar and difficult to determine one from another. Can they be revised?

Northern Beaches TEC Mapping	
4.2 Threatened Entities	<p>First para last line '<i>this process has identified 'data gaps' where future field survey would refine TEC distribution mapping.</i>'</p> <p>It would benefit the reader to know what strategy Council plans to undertake to fill in the data gaps in the report that have arisen as a result of inaccuracies with the State government native vegetation mapping, before LEP mapping occurs. This would assist with the defensibility of the process. It is noted on page 54 Section 4.3 that SMEC has recommended future updates to refine the accuracy and comprehensiveness of mapped core habitat corridors and threatened entities.</p> <p>This could be embellished with more detail such as:</p> <ul style="list-style-type: none"> • DPE are progressively refining native vegetation mapping and it is anticipated that any improvements released by DPE will be incorporated into the Biodiversity Planning Review mapping if more up to date. • Any further field validation undertaken by SMEC and Council staff- It is anticipated that additional field survey will be undertaken following public exhibition of the draft mapping in April-May, during which Council will seek suggested mapping reviews/amendments from the community. The validated outcomes of any additional surveys undertaken as a result of community feedback will then be used to inform the mapping which will be included in the draft LEP/DCP. (Note: Council will edit the draft mapping but not the SMEC report before it is re-exhibited as part of the draft LEP/DCP as only the maps will inform the planning documents) (NBC 2022 1/3/22) • On-ground flora assessments will also be required at the DA stage in areas identified with TECs, if the level of impact proposed exceeds a certain threshold. (NBC email 24.1.22). • Between LEP/DCP five yearly amendments, Council will continue to monitor and record changes in vegetation extent/composition and new threatened species sightings through its internal GIS and the BioNet Atlas. • Recorded changes to vegetation and threatened species distribution and habitat will inform biodiversity management programs and future LEP/DCP amendments. (NSW 2022 1/3/22)

Conclusion

This peer review concludes that:

1. the objectives of the report and the scope of works were met
2. the report and maps in the current form are relevant and useful for the intended purpose of informing a new Northern Beaches LEP and DCP
3. The methodology for the report, planning review and GIS spatial layer is defensible for evidence-based planning
4. Amendments to the draft report to include comments in Table 1 will improve clarity of the report and maps.

2.2 Sydney Green Grid, Plan 6, North District

The Sydney Green Grid is a NSW Government Architect initiative. It is intended to be an interconnected network of open space that will keep the city cool, encourage healthy living, enhance biodiversity, and ensure ecological resilience. Linkages between open spaces are fostered within the wider public realm by enhancing creek corridors, transport routes, suburban streets, footpaths and cycle ways.

The Sydney Green Grid, Plan 6, North District was prepared by Tyrrell Studio for the NSW Government Architect in March 2017. It was incorporated into the North District Plan discussed below in section 2.3 and reflected in Council's Local Strategic Planning Statement in section 2.5. The report maps the hydrological, ecological and recreational fragments of the northern district of Sydney that form the framework of the green grid.

The North District Ecological Grid will be the focus of this peer review. A comparison has been undertaken between Figure No. 1 in the NBC draft Biodiversity Planning Review called 'Northern Beaches Core and Corridor Mapping' and Figures N7 and N8 called the 'North District Ecological Grid Plan' (Tyrell 2017 p. 196 – 197). The analysis revealed some variations in interpreting core and corridor as follows:

- The Tyrell map identifies 'High Environmental lands', 'BioMap Regional Corridors' and BioMap Core Areas whilst the SMEC map identifies 'Core', 'Corridor', and NPWS Estate.
- Tyrell identifies all NPWS estate as 'High Environmental Lands' whilst the SMEC mapping only identifies core and corridor largely outside NPWS estate on the map, even though all NPWS estate is defined as core in section 2.3.1.2.
- The Tyrell report used a combination of GIS data mapping and consultation to develop an overview of the green infrastructure needs and character of the area including the NSW OEH Lands of High Environmental Value (HEV) (2016) map. The OEH 2016 SMCMA Native Vegetation of the Sydney Metropolitan Area – Version 3.1 VIS_ID 4489 GIS layers is not referenced as a GIS dataset source in the Tyrell report, yet it was one of the key datasets used in the SMEC mapping of the Threatened Ecological Community spatial layer.
- Since 2017, new data has become available which was used in the SMEC methodology including LIDAR Estimate of Canopy Height and Cover (NBC 2019) and the NSW Biodiversity Values Map (BV Map) which was first released in August 2017 just after the release of Plan 6 by Tyrell in March of the same year. The BV Map identifies land with high biodiversity value that is particularly sensitive to impacts from development and clearing. It has undergone numerous iterations since its first release.

The Tyrell report states *"Detailed information on areas of high environmental value is available from the Office of Environment and Heritage and **councils**. Where necessary, data and mapping of areas of high environmental value **will be ground-truthed to improve accuracy**."* (Tyrell 2017 196) Reports such as the SMEC mapping and Biodiversity Planning Review play a key role in further defining the Green Grid in more detail based on new datasets and informing the assessment of future delivery and implementation of Green Grid projects.

The NBC draft Council Biodiversity Planning Review is a key document to improve accuracy of mapping areas of high environmental value i.e. core and corridors to inform Council's LEP, DCP and green grid. The SMEC maps will also be important when identifying appropriate places for biodiversity stewardship sites (previously known as biobanking), for community engagement, and to justify

funding. Quotes from Plan 6 to support this statement in relation to corridors, biodiversity stewardship sites, bio-certification, community engagement and funding are included below.

Corridors

- *Connect biodiverse areas and apply planning and zoning provisions to protect corridors.*
- *Corridors aim to provide ecological connectivity, to facilitate the movement and dispersal of native flora and fauna across the landscape.*
- *Connecting biodiverse areas is particularly important in the face of climate change.*
- *Investigate opportunities to enhance native biodiversity in Green Grid corridors to help expand the urban forest to achieve canopy cover targets. (Tyrell 2017 p. 196-197)*

Biobanking, offsets and biodiversity certification

- *Protection and offsetting of impacts will be supported by innovative approaches such as Biodiversity Certification and Biodiversity Banking.... The use of Biodiversity Certification in strategic locations is supported as it identifies areas of high conservation value at a landscape scale and these areas can be avoided and protected while identifying areas suitable for development. (Tyrell 2017 p. 196-197)*

Community engagement

- *Engage local communities about the biological assets of their 'local patch of bush' to encourage active involvement in the protection and enhancement of bushland and other biodiversity (Tyrell 2017 p. 196-197)*

Funding

- *In recognition of the effort and funding dedicated to these areas, a level of protection should be provided through the planning process by applying appropriate provisions and mechanisms. (Tyrell 2017 p. 196-197)*

The key project opportunities for NBC local government area identified in Plan 6 are identified on page 191 and 203 of the Tyrell report. Many of the project areas are identified within the SMEC mapping as core or corridor but those that are defined as hydrological as opposed to recreational or ecological may not be identified in the SMEC mapping as creeklines were not made a 'candidate area' for a biodiversity corridor. (SMEC 2021 p.18)

Conclusion

This peer review concludes that:

- SMEC mapping and the draft Biodiversity Planning Review play a key role in further defining the Green Grid in more detail based on new datasets and informing the assessment of future delivery and implementation of Green Grid projects.
- The draft Council Biodiversity Planning Review is a key document to improve accuracy of mapping areas of high environmental value i.e. core and corridors to inform Council's LEP, DCP and green grid that will be more defensible due to accuracy.
- The SMEC maps will also be important when identifying appropriate places for biodiversity stewardship sites, for community engagement, and to justify funding for Green Grid projects.
- Consideration should be given to including creeklines as a 'candidate area' for a biodiversity corridor given creeks form key biodiversity corridors in urban areas. Furthermore the Green Grid Plan 6 report for Sydney's North proposes many projects that have hydrological values. Identifying these areas in the Biodiversity Planning Review will strengthen opportunities for funding. (Note: After raising this with Council, Econplan was advised on 1 March 2022 that:

- the study has included and mapped all creeks within the core and wildlife corridor mapping, unless the creek's biodiversity values were compromised such as being built upon, concreted, or piped.
- A technical study on waterways and riparian zones has just been prepared and is to be exhibited at the same time as the biodiversity planning review. Mapping from that study will also be used to inform proposed LEP / DCP controls.)

2.3 North District Plan – Our Greater Sydney 2056

In 2018, the Greater Sydney Commission released the North District Plan to guide councils in implementing the Sydney regional plan called *A Metropolis of Three Cities - the Greater Sydney Region Plan*. The District Plan is a 20-year plan and a bridge between regional and local planning to inform LEPs, community strategic plans, the assessment of planning proposals and alignment of local planning strategies.

One of the key directions in the District Plan is “A City in its Landscape”, valuing green spaces and landscape. The potential indicators for this key direction will be increased urban tree canopy and expanded Sydney Green Grid. The planning priorities related to this direction that are relevant to the scope of the NBC draft Biodiversity Planning Review are as follows:

- N15 Protecting and improving the health and enjoyment of Sydney Harbour and the District's waterways
- **N16 Protecting and enhancing bushland and biodiversity**
- N17 Protecting and enhancing scenic and cultural landscapes
- N18 Better managing rural areas
- N19 Increasing urban tree canopy cover and delivering Green Grid connections
- N20 Delivering high quality open space

This peer review will focus on the most relevant planning priority ‘N16 Protecting and enhancing bushland and biodiversity’.

Objective 27 in *A Metropolis of Three Cities* outlines how the NSW Government seeks to protect and manage biodiversity values across Greater Sydney, from National and State biodiversity conservation legislation to information such as biodiversity mapping. Planning Priority N16 in the North District Plan reinforces the importance of Objective 27 and provides a context to District issues.

The SMEC mapping methodology and NBC draft Biodiversity Planning Review report will satisfactorily inform the mapping process to meet objectives 27 of *A Metropolis of Three Cities* and the Actions under N16.

The draft Biodiversity Planning Review report will inform the following strategic approaches outlined in the District Plan:

- *For the North District, conservation planning will focus on opportunities to protect and enhance areas of endangered and critically endangered ecological communities outside the Protected Natural Area, including areas of native vegetation close to existing national parks.*
- *A strategic approach to protecting the biodiversity in the North District involves investing in connected bushland corridors and protecting larger pockets of remnant vegetation, as large and connected areas of bushland give the District's wildlife the greatest chance of survival.*

- Councils are also working together to map opportunities to restore and reconnect areas of habitat in established urban areas. This complements the delivery of the Greater Sydney Green Grid.
- Selected species of trees and understorey plants for parks and street planting in targeted areas supports the movement of wildlife and helps strengthen connections between areas of habitat.
- Strengthening the protection of bushland in urban areas will help to conserve the District's biodiversity, preserve its scenic landscape, and enhance its tourist and recreational values.
- Remnant vegetation should be recognised as an asset that can be incorporated into the planning and design of neighbourhoods; for example, in parks, school grounds and as street trees.
- Bushland in the District's rural areas will be protected and managed through place-based planning and incentivised as potential biodiversity offsets.
- The Biodiversity Conservation Act 2016 provides a framework and tools to avoid, minimise and offset impacts on biodiversity through the planning and development assessment process. There are a range of tools available to protect biodiversity on private land, including biodiversity stewardship agreements, conservation agreements and wildlife refuge agreements. (GSC 2018 p.102)

Table 2: Relevance / consistency comparison between the Biodiversity Planning Review and the North District Plan regarding Key Direction N16 Protecting and enhancing bushland and biodiversity

Action	Clause	Relevance / Consistency
66. Protect and enhance biodiversity by: 1	supporting landscape-scale biodiversity conservation and the restoration of bushland corridors	The GSP assigns the responsibility of this action to Councils, other planning authorities and State agencies. Through the SMEC mapping and report, NBC satisfactorily undertakes this responsibility in relation to identification of core and bushland/wildlife corridors.
2	Managing urban bushland and remnant vegetation as green infrastructure	The SMEC report will satisfactorily facilitate Action 2 by providing accurate information to inform planning controls and decisions on a landscape scale.
3	Managing urban development and urban bushland to reduce edge-effect impacts	<p>The SMEC report will satisfactorily facilitate Action 3 by providing accurate information to inform planning controls and decisions on a landscape scale to identify core and corridor areas. Once these areas are identified, controls can also be made to reduce edge-effect impacts.</p> <p>The SMEC report however does not map buffers or 'transition' areas as an entity which could inform planning controls in LEP and DCPs to reduce edge-effects. Note: Further discussion with Council staff on 1/3/22 clarified that transition areas were included as part of the mapped 'biodiversity corridors' to</p>

		minimise the number of future DCP controls, as the objectives and requirements are similar or the same.
--	--	---

Figure 20 ‘North District Protected Natural Area and Metropolitan Rural Area’ in the District Plan shows the extent of the District’s Protected Natural Area. It does not however detail the core biodiversity areas or corridors that are outside of the NPWS reserves. The SMEC map therefore greatly embellishes this information to be applied to the LEP and DCP and inform other Council strategies and plans. Figure 21 in the District Plan indicates the North District Green Grid opportunities and includes Council’s open space and reserves along with green grid priority corridors. It does not however reflect biodiversity values. The SMEC mapping will therefore fill this gap in the green grid.

Conclusion

As stated in the SMEC report *“Following the release of the ‘Greater Sydney Region Plan’ and the ‘North District Plan’ by the Greater Sydney Commission in March 2018, NBC is reviewing its planning instruments and developing a new, integrated LEP and DCP to guide its long-term land use planning, including the provision of new biodiversity planning controls to deal with protection of native vegetation, wildlife habitat and connectivity, and threatened entities (threatened species, threatened ecological communities and threatened populations). (SMEC 2021 p.9)*

The NBC draft Biodiversity Planning Review is consistent and aligns with the objectives of the North District Plan, particularly in relation to Planning Priority N16 ‘Protecting and enhancing bushland and biodiversity’. The Review will also be defensible and credible when applied to development of a new LEP and DCP and to guide long-term land use planning on the basis that the maps are updated periodically.

2.4 Draft GANSW Greener Places Design Guide (Issue no. 04 - 2020)

The Draft Greener Places Design Guide framework was prepared by the NSW Government Architect and provides information on how to design, plan, and implement green infrastructure in urban areas. The draft guide provides a consistent methodology to help State and local government, and industry create a network of green infrastructure comprising open space for recreation, urban tree canopy for climate adaptation and resilience, and bushland and waterways for habitat and ecological health.

This peer review will analyse the relevance and consistency of the NBC draft Biodiversity Planning Review with Section 3 Connecting bushland and waterways that provides a framework for improving connectivity between bushland and waterways supporting habitat and biodiversity in urban areas.

Relevant definitions:

The key definitions in the GA report have been compared to the definitions in the NBC draft Biodiversity Planning Review in Table 3.

Table 3: Definition comparison between the Biodiversity Planning Review and the GA Draft Greener Places Design Guide of Core Areas and Corridors

Definition in NBC BPR	Definition in draft Greener Places Design Guide	Comment
Core Areas		
<p>Table 2-2 identified criteria for mapping biodiversity corridor areas.</p> <ul style="list-style-type: none"> Core habitats consist predominantly of native vegetation. They may include weed thickets, but these should not be the main vegetation type. Patches of cleared or developed land may be present within the core habitat as long as they do not compromise its overall integrity. Such patches are not mapped or counted as part of the core habitat. Core habitats are generally at least 3.5 hectares in area. However, patches of vegetation smaller than 3.5 hectares in size can be considered as core habitat when the vegetation consists of a TEC or is of high biodiversity value. Core habitats should be continuous, not bisected by busy roads or major watercourses that are a significant barrier to fauna movements. However minor, little-used roads and tracks may be present within the core habitat. Core habitats need not be formal conservation reserves or bushland reserves. 	<p>Core areas of bushland and waterways are the least disturbed and the most biodiverse, representative of the structure, function, and composition of natural areas. Protection and management of these areas is important to protect biodiversity and ensure long-term stability of ecosystem functions.</p> <p>Transition areas in the GA report are defined as being 'located at the interface between a natural area and an adjoining urban environment and represent the transition from one ecosystem to another. These areas function as a buffer to core zones, protecting their condition, promoting regeneration, and improving their resilience to threats. Transition areas vary in extent and composition and may require ongoing maintenance. They can provide wildlife habitat, are often more suited to recreation uses such as cycleways, walkways, and picnic areas, and may offer benefits such as an asset protection zone for bushfire protection or buffer to core zones from invasive species".</p> <p>Need to consider the size of the core and distance between core areas in relation to the ecological sensitivity of the core area and the needs of the species that occur in there (particularly threatened or locally rare species). (Section 3.6)</p>	<p>The BPR did not propose a definition itself for 'core areas' but drew on the definitions and points from Drinnan (2005) and Smith and Smith (2009a) to outline what criteria a core area needs to meet.</p> <p>The analysis in the BRP report regarding the definition of core is not inconsistent with the definition for core in the GA report however they are still quite different. SMEC refers to predominantly native vegetation and patch size whilst the GA definition emphasizes high biodiversity, levels of disturbance, and structure, function and composition of natural areas. The result when mapped could be that the SMEC criteria which is broader, captures more land as core. The SMEC approach is also more consistent with a previous iteration of the GA NSW Greener Places <i>Draft Bushland and Waterways Manual</i> Issue 2, 2018.</p> <p>A definition for buffer or transition area was not provided in the SMEC report as it was not part of the scope. When reviewing the definition for transition areas in the GA draft guide, it is unclear whether an area with good native canopy but disturbed underneath with eg mowing, as occurs in many recreation areas, would constitute core or corridor in the SMEC report as structure is not a component in the criteria for core. This is also</p>

		an issue for bush fire prone areas adjoining bushland. As soon as the lower stories for core are cleared for an APZ does core become corridor?
Corridor, Wildlife Corridor, Connection zones		
<p>“it is difficult to define a ‘corridor’ succinctly because of the complex and multiple functions that a corridor may serve”.</p> <p>“The definition of a corridor as given by the GANSW points towards the Traditional Corridor Hypothesis which posits that corridors increase immigration and emigration by functioning as movement conduits between patches”</p> <p>Corridor design factors were also included in the report for successful corridors. (page 15)</p> <p>Table 2-3 identified criteria for mapping biodiversity corridor areas.</p> <p>Section 2.3.2.2 Biodiversity Corridor Area Mapping included criteria used to identify and map biodiversity corridor areas e.g.</p> <ul style="list-style-type: none"> Contiguous with mapped core, within 100m of core, contiguous with biodiversity corridor areas or within 100m of them, within 100m buffer of the ocean and tidal areas, urban exotic / native vegetation greater than 1 ha and within 100m of biodiversity corridor, recreation areas within 100m of core. 	<p>Connection zones are areas that support urban habitat and the movement of wildlife between core areas of bushland or waterways. Connection zones support genetic dispersal, ecological function and resilience and can include vegetated riparian corridors, street trees, ponds, rocky outcrops, parks, gardens and green roofs, and balconies. They are areas where most city dwellers interact with nature.</p> <p>The size of the core and distance between core areas:</p> <ul style="list-style-type: none"> Significant large core areas need wider corridors than smaller ones as they have the most biodiversity. More successful connections result when core habitats are closer to each other. Connections must be designed and structured effectively to meet the needs of a range of native fauna e.g. reptiles, small birds, and arboreal mammals. Lower, medium, and upper canopy features can be targeted to suit threatened species that occur in the area. <p>Areas with an existing canopy and opportunities for green spaces such as street verges, private gardens, and recreation areas that adjoin core areas are best suited to providing potential corridors. (Section 3.6)</p>	<p>The BPR did not propose a definition itself for ‘corridors’ but drew on the definitions and points from the GANSW. Townsend and Levey 2005, Kuring-gai Council and Sutherland Shire Council. The methodology to define what a biodiversity corridor was in terms of mapping was outlined in section 2.3.2.2 and is not inconsistent with the GA draft guide.</p> <p>The SMEC interpretation of corridor does not include green roof and walls.</p> <p>The SMEC report is unclear whether vegetation greater than 1 ha and within 100m of biodiversity corridor could include connected gardens that together form 1 ha or more of vegetation. This needs to be clarified.</p>

--	--	--

Strategic urban biodiversity frameworks:

The GA draft Guide presents “Strategic urban biodiversity frameworks (SUBF)” as a possible substitute to existing local government biodiversity strategies. The intent is to *“approach the conservation of urban habitat and biodiversity in a holistic way that not only directs strategic planning but also acts at the management level, including for example reserve plans of management and volunteer engagement to undertake conservation works.”*

The NBC Biodiversity Planning Review will inform an SUBF (if Council prepares one) in the way intended in the GA draft Guide as the maps will:

- assist in implementation of the NSW green infrastructure design framework, by informing identification of priorities and actions to improve urban habitats and bushland and waterway connections at the local level
- assist NBC to monitor and report on their implementation of these actions
- provide a narrative to bring the community closer to nature and give meaning and purpose to projects and places of urban habitat value.
- Inform priorities and actions integrated into local environmental plans and development control plans in the form of maps identifying core and corridor (but not transition areas) and integrated into other land-use strategies and management plans.

The GA draft Guide includes five key strategies to connect, protect, restore, enhance, and create urban habitat as an integral part of how urban areas are planned, constructed, and maintained. The strategies apply to remnant, transition, and urban environments that provide connections between core habitat.

1. Protect and conserve ecological values
2. Restore disturbed ecosystems to enhance ecological value and function
3. Create new ecosystems
4. Connect people to nature
5. Connect urban habitats

This peer review has referenced the SMEC draft report and maps against the detailed recommendations in the GA draft report that align for the five strategies, to improve urban habitat, support biodiversity, and connect people to nature as follows:

Table 4: How the draft Biodiversity Planning Review contribute to the GA draft Recommendations

GA Strategy	GA Recommendation	Will the draft Biodiversity Planning Review contribute to this recommendation?
1. Protect and conserve ecological values	1.Incorporate the goal to protect and conserve urban habitat in all relevant legislation, policies, strategies, plans, and programs.	Yes- the SMEC maps will help justify goals to protect and conserve
	3.Plan and manage land and water assets to protect and support ecological values on State and Council estate.	Yes – the SMEC maps will help identify relevant core and corridor land
	4.Establish place-based targets for the protection and conservation of urban habitat including greenfield areas	Yes - the SMEC maps will help identify relevant core and corridor land for protection
	5.Establish threshold levels for ecological communities beyond which no further development can be considered	Yes – SMEC map will help develop thresholds
	7.Require government and all landholders and managers to minimise edge effects on core, transition, and corridor areas, assisted through local government plans and management strategies.	Yes – the SMEC maps will help identify relevant core and corridor land where edge effects are to be minimized through LEPs, DCPs and management strategies with exception of transition areas
	9.Support recreation opportunities in major waterways and implement catchment programs to meet water quality targets.	Yes – by informing the environmental impact assessment process
2. Restore disturbed ecosystems to enhance ecological value and function	1.Develop a prioritisation process for natural area management decisions, and decisions about natural area restoration. Incorporate consideration of threatened species, endangered ecological communities, locally rare species, core bushland, and strategic linkages to maximise biodiversity conservation.	Yes - SMEC mapping will assist in this process for core and corridor but from for transition / buffer areas

	2.Assess impacts on biodiversity at the lot scale and incorporate suitable development controls to provide for habitat enhancement and avoid cumulative impacts to habitat, including habitat loss. Accompany this with monitoring and enforcement.	Yes – SMEC mapping will assist in this process, especially when incorporated in the LEP and DCP (transition areas excluded)
	3.Require plans of management to incorporate the need to protect, restore, enhance, create, and connect ecological habitats and provide opportunities to connect people to nature.	Yes – SMEC mapping will inform this process by identifying areas for protection etc
	4.Encourage local government, infrastructure agencies, and the community work to the Saving our Species program (Department of Planning and Environment) to improve outcomes for threatened species and endangered ecological communities.	Yes – SMEC mapping will inform this process
3. Create new ecosystems	1.Include natural areas and waterways when analysing open space and recreation needs, and where suitable, design projects to create new ecosystems in the provision of new recreation facilities and the management of existing ones.	Yes – SMEC mapping will inform this process
	2.Create development controls that support deep- soil landscape zones on private land to enable the planting of canopy trees which will contribute to creating new connections and ecosystems.	Yes – SMEC mapping will inform this process
	5.Identify projects to capture, harvest, and re-use urban stormwater and wastewater to create new habitat, such as ponds and wetlands that minimise impacts on waterways and enhance the blue grid.	Yes – SMEC mapping will inform this process
4. Connect people to nature	1.Design projects that encourage people to connect with nature while minimising ecological impacts, such as lookouts, bike and walking tracks, picnic facilities, interpretative signage, nature playgrounds, adventure sports facilities, water sports, ecotourism and wellbeing activities.	Yes – SMEC mapping will inform this process
	2.Facilitate education and community engagement programs that promote a better understanding and appreciation of urban habitat and encourage participation in volunteer conservation programs (e.g. Bushcare, citizen science, and National Tree Day, and efforts to improve urban habitat within private gardens).	Yes – SMEC mapping will inform this process

	3.Foster opportunities to create habitat when planning and assessing development on urban infill sites through innovative features (e.g. green walls, green roofs, balconies, artificial hollows, and water-sensitive urban design features such as wetlands).	Yes – SMEC mapping will inform this process
5. Connect urban habitats	1.Prepare and implement SUBFs at council or joint organisation of council level. Identify core, transition, and corridor areas and devise appropriate actions to connect, protect, conserve, enhance, and create urban habitat at all planning and land management levels.	Yes – SMEC mapping will be instrumental in informing this process (with exception of transition/buffer areas)
	3.Use SUBFs and green infrastructure networks (e.g. the Sydney Green Grid) to connect habitats when planning, designing, and managing precinct-level redevelopments (including State, district, and locally significant sites).	SMEC mapping will be instrumental in informing this process
	4.In collaboration with local government and planning panels, implement green infrastructure frameworks such as the Sydney Green Grid, and monitor their progress and periodically revise it.	SMEC mapping will be instrumental in informing this process and revisions
	6.Develop indicators for assessing the effectiveness of actions in SUBFs. The indicators need to be measurable, practical, and evidence-based to inform and measure the results of planning and urban design decisions. The Singapore Index ²⁰ can inform this process.	Yes – SMEC mapping will inform this process
	7.Collaborate with researchers, industry groups, and the community to develop methods that include all aspects of urban habitat and connectivity benefits (environmental, social, and economic).	Yes – SMEC mapping will inform this process
	8.Leverage biodiversity offsetting mechanisms to strategically identify, protect, restore, and enhance the ecological connectivity of green and blue grids.	Yes – SMEC mapping will inform this process in a strategic way
	9.Collaborate with researchers and industry groups to develop technical guidelines and specifications to support the integration of urban habitat principles in buildings, streets, parks, and public spaces. This could include a building rating scheme that incentivises the construction and retrofitting of buildings, stormwater infrastructure, and public spaces to incorporate urban ecology and facilitate connectivity in key corridors.	Yes – SMEC mapping will inform this process, particularly key corridors

	11 Develop appropriate minimum standards and targets for urban habitat and connectivity. Develop targets that reflect variations in context, and encourage use of SUBF targets designed for the specific area.	Yes – SMEC mapping will inform this process
	12. Implement coordinated community engagement to improve awareness of benefits and foster acceptance of habitat within urban areas.	Yes – SMEC mapping will inform this process

Conclusion

This peer review concludes that the SMEC report is consistent with the GA Draft Greener Places Design Guide framework – Section 3 Connecting bushland and waterways as well as the Strategic Urban Biodiversity Framework. The only divergence is in relation to transition/ buffer areas that are a key component on the GA draft Guide along with core and corridor, but which are not part of the scope for the SMEC draft report and mapping.

2.5 Northern Beaches Local Strategic Planning Statement (LSPS)

Towards 2040 is a 20-year land-use vision for the Northern Beaches Local Government Area and implements the planning priorities outlined in the Sydney North District Plan prepared by the greater Sydney Commission in 2016. It was adopted by Council in 2020 and was prepared in accordance with the requirements of Section 3.9 of the *Environmental Planning and Assessment Act 1979*. The document will inform the development of Council's new Local Environmental Plan (LEP) and Development Control Plan (DCP) but also Council policies and strategies, and the assessment of planning proposals. Accurate biodiversity mapping will be important to inform these planning instruments, strategic plans and policy.

The draft *Biodiversity Planning Review* report and maps Ref No. 30012906 dated 2 November 2021 have been reviewed in Tables 5 and 6 below for relevance and consistency with the relevant Northern Beaches Local Strategic Planning Statement priorities and actions, specifically Priority 2 'Protected and Enhance Bushland and Biodiversity' (pages 46 – 51).

Sustainability – Priority 1 – Healthy and valued coast and waterways

Relevant Principles:

- Protect and enhance the ecological condition of coastal areas, catchments (including groundwater aquifers), waterways (wetlands, watercourses, lagoons and estuaries) and their riparian areas.
- Conserve watercourses or restore them to their natural state where possible.

Comment: In order to protect, enhance, conserve and restore, first an accurate map is required to identify the location of biodiversity values before suitable responses or actions are devised. The Biodiversity Planning Review methodology and maps are suitable and defensible for use in the preparation of the following studies and strategies outlined in Actions 1.1-1.11 associated with Priority 1 – healthy and valued coast and waterways as well as associated environmental impact assessment of proposed works and stewardship programs.

1. Prepare a stormwater quality management plan to guide implementation of the risk-based framework, identify stormwater quality targets, and prioritise public and private stormwater infrastructure needs
2. Prepare an environment study to inform best-practice land use responses to growth and climate change
3. Develop LEP and DCP controls that incorporate the findings of the above studies, including stormwater quality targets; integrated water cycle management (including water sensitive urban design); coastal management programs; protection of riparian areas; coastal hazard management and criteria for environmentally friendly sea walls
4. Prepare an open space and recreation strategy and map a local green grid that supports environmentally sustainable access to the coast and waterways where appropriate
5. Implement Environment and Climate Change Strategy *Protect. Create. Live.* and develop associated action plans for coastal areas and waterways
6. Prepare long-term coastal management programs for the open coast, Hawkesbury River and Sydney Harbour and supporting plans for headlands, dunes and emergency response
7. Implement the Pittwater Waterway Strategy
8. Expand the W2 zone, subject to a strategic sites assessment, to permit, with consent, sustainable marina expansion. Marina expansion would only be considered subject to appropriate regard being given to all impacts including, but not limited to environmental, social, economic, transport, traffic, visual and waterway navigation
9. Investigate the feasibility of local green grid projects
10. Work with relevant stakeholders to promote community stewardship for Manly-Freshwater World Surfing Reserve
11. Work with Sydney Water on the development of the Eastern Sydney Regional Master Plan

Sustainability – Priority 2 – Protected and enhanced bushland and biodiversity

Relevant definitions:

The key definitions in the report have been compared to the definitions in the NBC LSPS in Table 5.

Table 5: Definition comparison between the Biodiversity Planning Review and the NBC Local Strategic Planning Statement of Core areas and Corridors

Definition in SMEC BPR	Definition in LSPS	Comment
Core Areas		
<p>Table 2-2 identified criteria for mapping biodiversity corridor areas.</p> <ul style="list-style-type: none"> • Core habitats consist predominantly of native vegetation. They may include weed thickets, but these should not be the main vegetation type. • Patches of cleared or developed land may be present within the core 	<p>‘Core areas include State-managed national parks; larger Council reserves including Manly Dam and Ingleside Chase Reserve; and some private land, including one of Sydney’s largest unreserved and largely privately owned areas of bushland that stretches across the Oxford Falls Valley west from Narrabeen Lagoon to Belrose</p>	<p>The BPR did not propose a definition itself for ‘core areas’ but drew on the definitions and points from Drinnan (2005) and Smith and Smith (2009a).</p> <p>The analysis in the BRP report regarding the definition of core is not inconsistent with the definition for core in the LSPS.</p>

<p>habitat as long as they do not compromise its overall integrity. Such patches are not mapped or counted as part of the core habitat.</p> <ul style="list-style-type: none"> • Core habitats are generally at least 3.5 hectares in area. However, patches of vegetation smaller than 3.5 hectares in size can be considered as core habitat when the vegetation consists of a TEC or is of high biodiversity value. • Core habitats should be continuous, not bisected by busy roads or major watercourses that are a significant barrier to fauna movements. However minor, little-used roads and tracks may be present within the core habitat. • Core habitats need not be formal conservation reserves or bushland reserves. 	<p>and Frenchs Forest. (NBC 2020 p. 47)</p> <p>Figure 28 gives an example of core areas, wildlife corridors and transition/buffer areas</p> <p>The LGA's bushland includes important core areas of habitat linked by connection zones (better known as wildlife corridors) as defined under the Government Architect NSW's draft Bushland and Waterways Guide. Transition areas, such as urban parks or backyards, provide a buffer that protects bushland from adjoining urban areas. (NBC 2020 p.46)</p>	
Corridor, Wildlife Corridor, Connection zones		
<p>"it is difficult to define a 'corridor' succinctly because of the complex and multiple functions that a corridor may serve".</p> <p>"The definition of a corridor as given by the GANSW points towards the Traditional Corridor Hypothesis which posits that corridors increase immigration and emigration by functioning as movement conduits between patches"</p> <p>Corridor design factors were also included in the report for successful corridors. (page 15)</p>	<p>Connection zones (or wildlife corridors) - help wildlife to move between core areas and support genetic dispersal. (LSPS 2020 26-27)</p>	<p>The BPR did not propose a definition itself for 'corridors' but drew on the definitions and points from the GANSW. Townsend and Levey 2005, Kuring-gai Council and Sutherland Shire Council. The methodology to define what a biodiversity corridor was in terms of mapping was outlined in section 2.3.2.2 and is not inconsistent with the LSPS</p>

<p>Table 2-3 identified criteria for mapping biodiversity corridor areas.</p> <p>Section 2.3.2.2 Biodiversity Corridor Area Mapping included criteria used to identify and map biodiversity corridor areas e.g.</p> <p>Contiguous with mapped core, within 100m of core, contiguous with biodiversity corridor areas or within 100m of them, within 100m buffer of the ocean and tidal areas, urban exotic / native vegetation greater than 1 ha and within 100m of biodiversity corridor, recreation areas within 100m of core.</p>		
--	--	--

Relevant Principles in the LSPS that the draft Biodiversity Planning Review and mapping with inform:

- Protect core areas and areas of high environmental value from urban development. (Note neither the LSPS nor the SMEC BPR give a definition for high environmental value)
- Conserve and restore threatened species habitat.
- Retain native vegetation and maintain or enhance ecological functions in core areas and wildlife corridors (connection zones).
- Ensure future developments avoid, then minimise, impacts on bushland before offsetting is considered.
- Increase the availability of local biodiversity offsets.
- Shape decisions for future bushland and biodiversity management around the consequences of climate change, including the need for increased bush fire risk mitigation and pest species management.
- Plant locally native species.
- Protect and enhance sustainable recreation in bushland reserves and natural areas without compromising the integrity of environmentally sensitive areas. (LSPS 2020 50)

Comment: In order to successfully implement the relevant principles above, first an accurate map is required to identify the location of biodiversity values before suitable responses or actions are devised.

The Biodiversity Planning Review is suitable and defensible for use in the preparation of the studies and strategies outlined in Actions 2.1-2.10 associated with Priority 2 – Protected and enhanced bushland and biodiversity, as well as associated environmental impact assessment of proposed works and stewardship programs. (Refer Table 6)

The LSPS states *“bushland will be reconceptualised as an asset for its intrinsic values and for the services it provides, including carbon and stormwater capture and pollution management. We will also*

increase the availability of local biodiversity offsets and aim to offset future development locally.”
(NBC 2020 p. 47)

Table 6: Relevance / consistency comparison between the Biodiversity Planning Review and the NBC Local Strategic Planning Statement regarding Sustainability – Priority 2 – Protected and enhanced bushland and biodiversity

Action	Clause	Relevance / Consistency
2.1	Prepare a biodiversity planning analysis to identify core, transition and connection zones (wildlife corridors) and to support a strategic urban biodiversity framework	<p>The SMEC report directly fulfills Action 2.1.</p> <p>The scope of the SMEC report related to core habitat/corridor and threatened entities spatial layers fit for adoption by the NBC planning instrument. ‘Transition areas’ were not part of the scope and therefore were not mapped.</p> <p>Transition areas are basically buffers to core and corridor and are based on existing vegetation coverage. For instance a car park abutting core that has no vegetation would not be a transition. However a car park that has good tree canopy coverage would function as a transition between the urban and core bushland area. Transition areas are not easy to map however as the car park without trees could be retrofitted to contain trees. Similarly the carpark with trees could be redeveloped to contain less trees or none depending on the land use. Transition areas may therefore be better managed on a site by site basis through DCP planning controls and through Urban Canopy Strategies that also account for issues such as fire hazard.</p>
2.2	Prepare LEP and DCP controls that protect bushland and biodiversity, including the findings of technical studies; use of environmental protection zones and designating environmentally sensitive areas; and work with the Department of Planning, Infrastructure and Environment on the application of State policies	The SMEC report will satisfactorily facilitate and inform Action 2.2. in relation to core bushland and biodiversity corridors.
2.3	Investigate a local biodiversity offset framework that meets the <i>Biodiversity Conservation Act 2016</i> , encourages local offsets or increases obligations when offsets are provided outside the LGA, district or bioregion	The SMEC report will satisfactorily facilitate Action 2.3. to identify biodiversity values and where offsets would be most beneficial.

2.4	Investigate biodiversity investment opportunities and establish offset lands or biodiversity stewardship sites (formerly biobank sites) on Council land where appropriate	The SMEC report will satisfactorily facilitate Action 2.3. to identify biodiversity values and where offsets or biodiversity stewardship sites would be most beneficial.
2.5	Investigate options for funding, acquisition and reservation of urban tree canopy and bushland with biodiversity, habitat, recreational and scenic values, including incentives or assistance to private property owners	The SMEC report will satisfactorily facilitate Action 2.5. to identify biodiversity values.
2.6	Embed green infrastructure into the NSW planning system and make funding available through development contributions, rate reductions or levies	The SMEC report will satisfactorily facilitate Action 2.6. with accurate mapping to identify biodiversity values to be protected in planning instruments (LEP and DCP) in relation to core and corridor lands
2.7	Implement the Bushland and Biodiversity Policy, Environment and Climate Change Strategy, <i>Protect. Create. Live.</i> and develop associated action plans for bushland and biodiversity, including programs to better connect remnants of bushland	The SMEC report will satisfactorily facilitate Action 2.7. with accurate mapping to identify biodiversity values to be protected, enhanced and better connected.
2.8	Prepare an open space and recreation strategy and map for a local green grid that supports environmentally sustainable access to bushland where appropriate	The SMEC report will satisfactorily facilitate Action 2.8. with accurate mapping to identify the green grid and biodiversity values in open space and recreation areas to be protected and connected in plans of management and masterplans
2.9	Investigate mechanisms to minimise the incidence of unauthorised removal of tree canopy or native vegetation, such as through ongoing monitoring and reporting, planning controls in the LEP and/or DCP, increased enforcement and compliance and education programs	The SMEC report will satisfactorily facilitate Action 2.9. with accurate mapping of existing native vegetation.

Map 3 'Northern Beaches Natural Green Grid' indicates connectivity and examples of threatened and iconic wildlife in the LSPS in a very broad brush way. A review of the SMEC Figure 1 is not inconsistent with Map 3 and is of course much more detailed.

Sustainability – Priority 4 – Protected Metropolitan Rural Area

Relevant and consistent LSPS Principles with the SMEC report:

- Protect biodiversity values for riparian corridors and areas that support threatened species, communities and populations and on lands identified for biodiversity connectivity.
- Support establishment of local biodiversity offset sites and stewardship agreements.
- Encourage the spread of indigenous vegetation and tree canopy.

Table 7: Relevance / consistency comparison between the Biodiversity Planning Review and the NBC Local Strategic Planning Statement regarding Sustainability – Priority 4 – Protected Metropolitan Rural Area

Action	Clause	Relevance / Consistency
4.1	Use the employment study, social infrastructure study, environment study, biodiversity planning analysis , stormwater quality strategy, open space and recreation strategy and destination management plan to inform place-based planning in the MRA and future MRA investigation area	The NBC Biodiversity Planning Review and mapping will inform this process
4.2	Develop LEP and DCP controls addressing land use conflicts that compromise the rural and environmental values of the MRA and future MRA investigation area, and having regard for the outcomes of the housing, employment, local character and environment studies , and identified environmental hazards and constraints	The NBC Biodiversity Planning Review and mapping will inform this process
4.6	Work with the Greater Sydney Commission and the Department of Planning, Infrastructure and Environment to investigate potential for inclusion of the 'future MRA investigation area' in the MRA, including Belrose (north), Oxford Falls (south) and Cromer Heights (west)	The NBC Biodiversity Planning Review will inform this process
4.7	Work with the Metropolitan LALC to better understand constraints as well as feasible and appropriate land use opportunities on land owned by the MLALC	The NBC Biodiversity Planning Review and mapping will inform this process

Priority 5 – Greener Urban Environments

Relevant Principles:

- Create a resilient, healthy and interconnected urban tree canopy across the Northern Beaches.
- Protect, maintain and enhance the existing urban tree canopy, including mature trees.
- Provide a diverse range of species of varying families and genera, prioritising local native tree, shrub and ground cover species where possible.
- Provide habitat for wildlife and connect to the local green grid including wildlife corridors.

Table 8: Relevance / consistency comparison between the Biodiversity Planning Review and the NBC Local Strategic Planning Statement regarding Sustainability – Priority 5 – Greener Urban Environments

Action	Clause	Relevance / Consistency
5.4	Investigate the feasibility of Greater Sydney Green Grid projects, identify a local green grid, and protect and enhance these grids in the new planning framework	The NBC Biodiversity Planning Review and mapping will help inform the environmental assessment process, feasibility of the priority Greater Sydney Green Grid projects and implementation

Priority 6 – High Quality Open Space for Recreation

Relevant Principles:

- Ensure access to natural open space and waterways is sustainable so that these areas are preserved for the future.

Table 9: Relevance / consistency comparison between the Biodiversity Planning Review and the NBC Local Strategic Planning Statement regarding Sustainability – Priority 6 – High Quality Open Space for Recreation

Action	Clause	Relevance / Consistency
6.2	Develop LEP and DCP controls that respond to the findings of the above studies (eg social infrastructure study and an open space and recreation strategy) and improve provision of open space and recreation (such as innovative sports facilities inclusion in new developments), connect to the local green grid, and manage conflicts, for example, by applying environmental protection zones to natural open spaces	The NBC Biodiversity Planning Review and mapping will inform this process

Conclusion

- This peer review concludes that the SMEC report is consistent with the LSPS.
- The only divergence is in relation to Action 2.1 which states “*Prepare a biodiversity planning analysis to identify core, transition and connection zones (wildlife corridors) and to support a strategic urban biodiversity framework*”. The scope of the SMEC report related to core habitat/corridor and threatened entities spatial layers fit for adoption by the NBC planning instrument. ‘Transition areas’ were not part of the scope and therefore were not mapped.
- The definitions in the LSPS for core and corridor could also be included in the discussion of the SMEC report.

2.6 Northern Beaches Bushland & Biodiversity Policy (2021)

Biodiversity assets protected under this Policy include – but are not limited to – core habitat, wildlife corridors. Relevant principles of the policy in relation to the SMEC report include:

1. 'Maximising the retention of bushland and biodiversity assets across the Northern Beaches and recognising the necessity of proactive measures to protect and restore these assets.'
2. Incorporating the protection of bushland and biodiversity into Council operations, strategic land use planning and development assessment.'

The policy states "Council will prioritise the protection and management of areas with high environmental values including core habitats, wildlife corridors, threatened ecological communities, bushland reserves and areas identified on the NSW Biodiversity Values Map" (NBC 2021 p 2).

The Policy states that Council will apply the following approaches which are also relevant to the scope of the SMEC report to achieve the Policy aims:

- Prioritising the retention of core habitat areas to maintain high levels of biodiversity and protect water catchments.
- Identify, conserve and, where appropriate, restore threatened species habitat.
- Investigate options for the provision of incentives/assistance to property owners to conserve bushland on private land, provided bushland reserves are of a viable size and shape with vegetated linkages to other bushland in secure tenure.
- Coordinate with other local councils, state government and owners of large bushland areas (e.g. Metropolitan Local Aboriginal Land Council) to protect bushland and wildlife corridors at a regional level. (page 3)

Definitions:

Table 10: Definition comparison between the NBC Bushland and Biodiversity Policy and the Biodiversity Planning Review for core areas and wildlife corridors

Definition in SMEC BPR	Definition in Bushland and Biodiversity Policy	Comment
Core Areas		
<p>Table 2-2 identified criteria for mapping biodiversity corridor areas.</p> <ul style="list-style-type: none"> • Core habitats consist predominantly of native vegetation. They may include weed thickets, but these should not be the main vegetation type. • Patches of cleared or developed land may be present within the core habitat as long as they do not compromise its overall integrity. Such patches are not mapped or counted as part of the core habitat. 	<p><i>Core Habitat:</i> larger contiguous areas of bushland which are usually over 3.5 ha in size. Core habitats are the least disturbed and the most biodiverse, representative of the structure, function and composition known to exist before European settlement. Protection and management of these areas is important to protect biodiversity and ensure long-term stability of ecosystem functions (Adapted from Government Architect's Office of NSW 2018 publication: <i>Greener Places</i> –</p>	<p>The BPR did not propose a definition itself for 'core areas' but drew on the definitions and points from Drinnan (2005) and Smith and Smith (2009a).</p> <p>The BPR considered on page 16 the definition for core habitat from the Government Architect's Office of NSW 2018 publication: <i>Greener Places – Draft Bushland and Waterways Manual</i>).</p> <p>The analysis of core in the BRP report is not inconsistent with the definition for core in the</p>

<ul style="list-style-type: none"> Core habitats are generally at least 3.5 hectares in area. However, patches of vegetation smaller than 3.5 hectares in size can be considered as core habitat when the vegetation consists of a TEC or is of high biodiversity value. Core habitats should be continuous, not bisected by busy roads or major watercourses that are a significant barrier to fauna movements. However minor, little-used roads and tracks may be present within the core habitat. Core habitats need not be formal conservation reserves or bushland reserves. 	<p><i>Draft Bushland and Waterways Manual</i>). (NBC 2021 p.6)</p>	<p>Bushland and Biodiversity Policy.</p>
<p>Corridor, Wildlife Corridor, Connection zones</p>		
<p>“it is difficult to define a ‘corridor’ succinctly because of the complex and multiple functions that a corridor may serve”.</p> <p>“The definition of a corridor as given by the GANSW points towards the Traditional Corridor Hypothesis which posits that corridors increase immigration and emigration by functioning as movement conduits between patches”</p> <p>Corridor design factors were also included in the report for successful corridors. (SMEC 2021 p.15)</p> <p>Table 2-3 identified criteria for mapping biodiversity corridor areas.</p> <p>Section 2.3.2.2 Biodiversity Corridor Area Mapping included criteria used to</p>	<p><i>Wildlife Corridors</i>: areas that support urban habitat and the movement of wildlife between core areas of bushland or waterways. Wildlife corridors support genetic dispersal, ecological function and resilience and can include vegetated riparian corridors, street trees, ponds, rocky outcrops, parks, gardens and green roofs, and balconies. They are areas where most city dwellers interact with nature (Adapted from Government Architect’s Office of NSW publication: Greener Places – Draft Bushland and Waterways Guide). (NBC 2021 Page 7)</p>	<p>The BPR did not propose a definition itself for ‘corridors’ but drew on the definitions and points from the GANSW. Townsend and Levey 2005, Kuring-gai Council and Sutherland Shire Council. The methodology to define what a biodiversity corridor was in terms of mapping was outlined in section 2.3.2.2 and is not inconsistent with the Bushland and Biodiversity Policy definition of wildlife corridor.</p>

<p>identify and map biodiversity corridor areas e.g.</p> <p>Contiguous with mapped core, within 100m of core, contiguous with biodiversity corridor areas or within 100m of them, within 100m buffer of the ocean and tidal areas, urban exotic / native vegetation greater than 1 ha and within 100m of biodiversity corridor, recreation areas within 100m of core.</p>		
---	--	--

Conclusion

- This peer review concludes that the SMEC report and mapping will assist Council in implementing the relevant principles of the Bushland and Biodiversity Policy 2021 and is consistent with the Policy.

2.7 Relevance and utility to inform a new Northern Beaches LEP and DCP

EConPlan concludes that the SMEC methodology for the Northern Beaches Council Biodiversity Planning Review is defensible for application in evidence-based planning including for Councils new comprehensive LEP and DCP to be prepared under the NSW *Environmental Planning and Assessment Act 1979*.

Council will prepare the new LEP in accordance with the *Standard Instrument – Principal Local Environmental Plan (2006)* that was recently updated in December 2021 with conservation zones changing from E zones to C zones. The LEP is the primary land use planning mechanism that influences land use, land character and green infrastructure. The land use zones, objectives and development standards establish the context for decision making on individual developments which shape urban areas.

Inclusion of the biodiversity values maps prepared by SMEC in the LEP can:

- set out the values of particular significance that are given some level of statutory protection or assessment under existing legislation
- does so 'up-front' so that biodiversity values can be considered in strategic planning, rather than at the end of the planning process (i.e. DA assessment);
- will help reduce the number of contentious, protracted Development Applications by ensuring development is targeted to areas of lower environmental value.
- Facilitate areas of core, corridor, TS and TEC being given consideration in all strategic land use planning processes including growth strategies and regional and local plans.

In accordance with the LEP Template, NBC will be able to consider incorporating the following in the new LEP based on the defensible and evidence based SMEC mapping:

Part 1, 1.2 Aims of the plan

New green infrastructure aims like biodiversity connectivity, protection of core and enhancement of the green grid, urban tree canopy and urban heat reduction to improve biodiversity, liveability, walkability and cooler suburbs etc.

Part 1, 1.4 Definitions

Councils can add additional definitions if required to clarify clauses in the LEP e.g. “green infrastructure”, ‘green grid’, ‘biodiversity corridors’, ‘core’, ‘urban heat’, ‘urban heat island effect’, ‘liveable’, ‘urban canopy’ and ‘urban forest’. Definitions for many of these terms already exist in state government documents or the SMEC report.

Part 2, 2.3 Zone objectives

Besides adopting conservation zones e.g. C2-C4 to achieve green infrastructure outcomes, Direction 1 allows additional objectives to be included in a zone at the end of the standard listed objectives to reflect local objectives of development, but only if they are consistent with the core objectives for development in the zone as set out in the Land use table. Biodiversity, sustainability, resilience and urban heat management outcomes from green infrastructure, could meet Direction 1 requirements for most zones.

Part 3 Exempt and Complying development

Clause 3.3 comprises compulsory clauses that identify environmentally sensitive areas that are excluded from the *SEPP (Exempt and Complying Development Codes) 2008*.

A direction of the clause states “*Additional areas may be added to this list*”, allowing for areas identified as core, endangered ecological communities or threatened species habitat for instance, to be mapped in the LEP as ‘environmentally sensitive areas’ and / or listed under clause 3.3. Precedents include:

- [Hunters Hill LEP 2012](#) River Front Area Map that incorporates privately owned land,
- [Randwick LEP 2012](#) biodiversity values map, however it is largely in public ownership or within golf courses,
- [Campbelltown LEP 2015](#) includes
 - a) land within 40 metres of the top bank of a waterway or artificial waterbody,
 - b) land that has a gradient exceeding 16%,
 - c) land that is in Zone C2 Environmental Conservation,
- [Penrith LEP 2010](#) includes
 - a) land in Zone C1 National Parks and Nature Reserves, Zone C2 Environmental Conservation, Zone W1 Natural Waterways or Zone W2 Recreational Waterways,
 - b) land on the [Natural Resources Sensitivity Land Map](#),
 - c) land near the river or in the riverine corridor, wetlands or conservation areas sub catchments, within the meaning of [Sydney Regional Environmental Plan No 20—Hawkesbury-Nepean River \(No 2—1997\)](#),
- [Canada Bay LEP 2013](#) includes land that is in Zone C2 Environmental Conservation as well as land identified as “Environmentally Sensitive Land” on the Environmentally Sensitive Land Map that includes some privately owned land along the foreshore,
- [Sutherland LEP 2015](#) lists the following maps as indicating ‘environmentally sensitive land’ instead of listing the maps under clause 3.3 a) Natural Landform, b) Riparian Lands and Watercourses, c) Terrestrial Biodiversity

LEP Maps

The Standard Template for LEPs does not restrict what can be mapped (cl.1.7.) therefore LEPs can include a range of maps to support provisions in the LEP. Maps in LEPs that are based on solid research, provide a good indication of a land's natural values and its role in the landscape, not only its land use zone. The maps prepared by SMEC are suitable for the LEP to identify core, corridor, and Threatened entities spatial layers including threatened species and threatened ecological communities.

Biodiversity map overlays in the LEP provide a legal mechanism for introducing additional assessment requirements for development applications or exclude certain land from certain complying development or provide alternative requirements.

The inclusion of biodiversity corridor mapping in the terrestrial biodiversity map in LEPs gives NBC *“greater regulatory control over developments that will impact or have potential to impact on the habitat values of land within the mapped corridors. It is therefore more likely to facilitate the maintenance and enhancement of habitat connectivity compared to limiting such mapping to DCPs”* (SSROC 2016 p. 17)

Furthermore, DPE recently developed a local character overlay and draft local character clause that will allow councils to insert a reference to local character in their LEP via a Local Character Statement and map. The SMEC maps will help inform character statements in the NBC area along with biodiversity values in heritage statements to accompany heritage sites or heritage conservation areas that are also included in Council LEP maps and schedules. Heritage maps can be used to protect green infrastructure values as natural, aesthetic, scientific or cultural values, as defined by the *Heritage Act 1977* can be incorporated.

Part 5 Miscellaneous provisions and Part 6 Additional Local Provisions

The LEP template gives councils the opportunity to include their own provisions that can relate to biodiversity or green infrastructure that are tied to environmental layers mapped in the LEP including minimum landscaped areas for different densities and environmentally sensitive areas. Provisions can require the consent authority to consider adverse impacts including wildlife corridor fragmentation, loss of tree canopy and only grant consent when impacts will be managed to avoid significant adverse environmental impact or where satisfactory alternatives or mitigation measures are applied.

Part 5 or 6 of LEPs can also include design excellence, sustainability excellence and precinct specific controls that focus on green infrastructure outcomes. NBC would need to define what that means, where it is to apply and how green infrastructure is to be considered.

Development Control Plan

Councils are required to prepare a Development Control Plan (DCP) to complement the LEP. The DCP provides detailed planning and design guidelines to support the planning controls in the LEP. There are no mandatory provisions for DCPs, and they can therefore be quite prescriptive. Unlike LEPs, however, DCP provisions are not statutory requirements, but must nevertheless be taken into account by Councils when assessing DAs. (SSROC 2016 p. 18)

Urban pressures in most local government areas are forcing reviews of DCP provisions in relation to biodiversity, and associated provisions such as minimum deep soil areas, landscaping requirements, setbacks, tree protection, water sensitive urban design and incentive schemes, to encourage and protect green infrastructure. Furthermore, application of clause 3.3 in the LEP which switches off

exempt and complying development in environmentally sensitive areas, heritage conservation areas or Local Character Areas allows Council's the ability to fully implement their DCPs.

It is noted that in the South Sydney Region of Councils report "Connected Corridors for Biodiversity: Guide to Tools, financial incentives and other mechanisms for promoting biodiversity conservation on private property, December 2016" it states on page 17 that

"In the Warringah Council area there is an automatic requirement for a biodiversity assessment and preparation of a biodiversity management plan in relation to developments that will modify a specific area of native vegetation and/or wildlife corridor. While the focus of biodiversity assessments is usually on threatened species and ecological communities, in accordance with NSW and Commonwealth legislative requirements, this often leads to species and communities that are not threatened, but that are nevertheless significant in the local context, being overlooked or not considered meaningfully. Biodiversity assessment guidelines tailored to the local context can also assist in preventing this".

Although the SMEC maps provide a strong basis for biodiversity controls for Threatened Species, Threatened Ecological Communities, core and wildlife corridor, NBC will need to be mindful of this issue when preparing the new DCP.

The SMEC maps will help support Councils new DCP and detailed biodiversity provisions that could specify:

- requirements for a biodiversity assessment to be undertaken and for a biodiversity management plan to be prepared
- requirements for creation of new habitat features such as freshwater ponds, rock features etc in addition to requirements for planting with native species
- appropriate offsetting requirements in relation to habitat features removed, with the area/number of habitat features removed to be offset at an equivalent or greater rate (for example, requiring three trees to be planted for every one removed. (SSROC 2016 p, 21)
- where "wildlife/ habitat corridor enhancement" is needed to improve connectivity.

3.0 Conclusion

As demonstrated above, the draft Biodiversity Planning Review and mapping is largely consistent with the District Plan, Councils Local Strategic Planning Statement, the Green Grid, Northern Beaches Bushland and Biodiversity Policy and the Draft GANSW Greener Places Design Guide.

SMEC successfully fulfilled the scope of the draft Biodiversity Planning Review report and the results of the project have:

- Identified significant areas of core habitat and a network of biodiversity corridor areas across the LGA
- identified important key biodiversity assets, particularly threatened entities listed under the BC Act, and the EPBC Act. These threatened entities include likely or confirmed occurrences of, or habitat for threatened species, populations and ecological communities

EConPlan concludes that the Northern Beaches Council Biodiversity Planning Review methodology and mapping is defensible and credible. It is also consistent across the LGA and suitable for evidence-based planning to inform:

Northern Beaches Local Environmental Plan

- The identification of potential 'Conservation Zones'
- LEP Biodiversity Map and controls

Development Control Plan

- Development controls and map layers of:
 - Biodiversity (wildlife) corridors
 - Core habitat
 - Threatened Species and Ecological Communities
 - Native Vegetation (prepared separately to the Biodiversity Planning Review)

Submission to the Department of Planning and Environment

- Submission of updated mapping to inform consultation and potential local revisions of the NSW Biodiversity Values Map.

Reports such as the SMEC mapping and Biodiversity Planning Review can also play a key role in further defining the Green Grid in more detail based on new datasets and informing the assessment of future delivery and implementation of Green Grid projects. The SMEC maps will be important when identifying appropriate places for biodiversity stewardship sites (previously known as biobanking), for community engagement, and to justify funding. The mapping can also inform heritage statements of significance, neighbourhood character areas, plans of management for reserves, environmental management plans for development sites, DA consent conditions, Voluntary Planning Agreements, Council biodiversity and recreation strategies, environment and climate strategies and action plans for biodiversity outcomes.

Table 1 of this report contains a number of recommendations for Council to consider before the draft report and maps are finalised that will improve the clarity of the document.

References

Greater Sydney Commission 2018, *Our Greater Sydney 2056: North District Plan – Connecting Communities*

Northern Beaches Council 2022 Email to Isabelle Connolly EConPlan 24 January 2022

Northern Beaches Council 2020, *Local Strategic Planning Statement - Towards 2040*

Northern Beaches Council 2021, *Bushland & Biodiversity Policy*

Northern Beaches Council, Biodiversity Planning Team *pers com* 1 March 2022

SMEC, 2021 *draft Northern Beaches Council Biodiversity Planning Review*, 2 November 2021 prepared for Northern Beaches Council

Southern Sydney Regional Organisation of Councils Incorporated (SSROC) *Connected Corridors for Biodiversity: Guide to Tools, financial incentives and other mechanisms for promoting biodiversity conservation on private property*, December 2016

Tyrell Studio 2017, *Sydney Green Grid, Plan 6, North District* prepared for the NSW Department of Planning and Environment in association with the Office of the Government Architect

Appendix 1 Northern Beaches Council Biodiversity Planning Methodology Review by EConPlan, 6 August 2019

Terminology of different habitat connectivity categories

Recommendation

1. There is no obligation to adopt the term “transition” as proposed in the Bushland and Waterways manual. The term is very broad and Council may benefit from more specific categories that can then be associated with more specific planning controls e.g. for riparian areas, foreshore, geological features or bushland. Planning controls also need to specifically address areas needing enhancement as well as areas needing corridor values protected
2. Council could consider the following categories for mapping
 - a) Core Habitat (with possible subcategories e.g. foreshore, bushland, riparian)
 - b) Support for Core (with possible subcategories e.g. open space)
 - c) Wildlife Corridor (possible subcategories- Canopy remnant, Urban canopy, landscape remnant, riparian, foreshore, open space, weedy habitat etc)
 - d) Wildlife Corridor enhancement (more prescriptive) or Wildlife Corridor potential (leaves wriggle room) for areas that could become corridorsDraft maps indicating the biodiversity network then need to be overlayed with EEC, TS and critical habitat maps to identify possible indicator species, refine corridor requirements and inform planning controls)
3. I think it would be good if the biodiversity mapping acknowledges the shift from Council’s traditional management approach – management of trees, bushland and EECs, to urban forest management and greenweb/ green grid / wildlife corridors. This may warrant the need for additional categories from a planning perspective e.g. ‘urban canopy’ and ‘canopy remnant’ subcategories above in point 2.

Discussion

1. The definition for transition area in the Bushland and Waterways Manual is very broad:

“Transition areas provide ancillary habitat or secondary linkages between habitats. They can also contain land that forms a buffer between developments adjacent to key habitats and corridors. Typical examples include a narrow riparian or biodiversity corridor or small pocket park containing degraded remnant vegetation. These areas tend to suffer from various external impacts such as stormwater, rubbish dumping, and weeds from adjoining gardens and may have been cleared in the past.”

The word “buffer” was not used due to its confusion with fire terminology and I still think it should be avoided as a category and prefer “support for core”.

The Sutherland Greenweb Strategy states:

“Wildlife Corridors – facilitate the movement of species between areas of core habitat. Species may need to move between core habitat areas for a range of reasons. They may need to find breeding

partners, to recolonise an area after an event such as a fire, or they may need to move between several core habitat areas to provide a sufficiently large home range. As with core habitat areas, different species have different requirements in terms of width and length of corridors.

Wildlife corridors are the equivalent of the roads that link our suburbs, which facilitate people travelling from their suburb to obtain other things such as food, employment, etc.

Habitat Corridors – *are similar to wildlife corridors, but are generally wider and provide the benefits of both habitat and corridors. Thus animals may both live and move through these corridors.*

These are the basic building blocks of a Greenweb system. However not every patch of bush forms core habitat and not every grove of trees forms an effective corridor. “

From a planning control perspective, I don't see distinguishing between these two definitions has any great benefit and I don't have a preference.

What does need to be identified in the mapping is where “**wildlife/ habitat corridor enhancement**” is needed to improve connectivity as this will trigger new planning controls.

Ku Ring Gai Council's ecological grid uses the following terms within their identified biodiversity corridor:

- Core biodiversity land
- Support for core biodiversity land
- Landscape remnant
- Biodiversity corridors and buffer
- Canopy remnant

Sutherland Greenweb Strategy uses the following categories:

- Core habitat
- Wildlife corridor
- Habitat corridor
- Linkages
- Buffers

In terms of the urban forest, and implementing it, along with habitat corridors as a concept in planning controls, I think there are advantages in identifying areas of “canopy remnant” from general “urban canopy” areas that were cleared and revegetated, This is because landscaping controls in the DCP may need to target some areas for endemic plantings whilst in other areas you may not be so prescriptive. In such cases, to justify those DCP controls, it may be beneficial to back them up with the biodiversity mapping which could distinguish areas dominated by remnant canopy from areas that are dominated by exotic canopy within urban zoned areas.

As noted in the discussion, wildlife corridors can have many functions and might be more suitable for some species than others based on their characteristics. There may be some interrelationships in terminology needed with Council's waterways management strategy and planning controls.

Therefore, Council may prefer to break the habitat corridor down into more specific subcategories e.g:

“riparian corridor” e.g. creeklines and adjoining wetlands

“foreshore corridor” e.g. for tidal affected coastline
“Urban canopy corridor” e.g. street trees and trees on private property not remnant canopy
“open space corridor” e.g. ovals, parks
“remnant landscape” e.g. for a cliff, rocky outcrop or small patches of highly fragmented bushland

I did a search of definitions in legal instruments that may be of help in defining categories.

Wildlife Corridor – refers to a strip of vegetation that facilitates species movement and gene flow between two areas of native vegetation. (Sutherland Greenweb Strategy)

Riparian Vegetation – refers to vegetation that grows within and adjacent to a watercourse, that represents the transition from aquatic to terrestrial vegetation. (Sutherland Greenweb Strategy)

Habitat – means an area occupied, or periodically occupied, by a species, population or ecological community and includes both the living (plants, animals) and non-living (soil, water, geology, air) components. (Sutherland Greenweb strategy)

Core Habitat – refers to an area of habitat that is of a size and configuration so as to provide significant habitat resources for a variety of native flora and fauna. (Sutherland Greenweb strategy)

foreshore means the area of land between the highest astronomical tide and the lowest astronomical tide. (Coastal Management Act 2016)

beach system means the processes that produce the beach fluctuation zone and the incipient foredunes and foredunes landward of the relevant beach. (Coastal Management Act 2016)

estuary means any part of a river, lake, lagoon or coastal creek whose level is periodically or intermittently affected by coastal tides, up to the highest astronomical tide. (Coastal Management Act 2016)

habitat includes:

- (a) an area periodically or occasionally occupied by a species or ecological community, and
- (b) the biotic and abiotic components of an area. (Biodiversity Conservation Act 2016)

habitat includes habitat periodically or occasionally occupied by a species, population or ecological community. (NPW Act 1974)

bushland means land on which there is vegetation which is either a remainder of the natural vegetation of the land or, if altered, is still representative of the structure and floristics of the natural vegetation. (LG Act)

park, in relation to land, means an area of open space used for recreation, not being bushland. (LG Act)

tidal waters includes the waters of the sea or of any lake, estuary, harbour, river, bay or lagoon in which the tide ebbs and flows. (LG Act)

biological diversity means the diversity of life and is made up of the following 3 components:

- (a) genetic diversity—the variety of genes (or units of heredity) in any population,
- (b) species diversity—the variety of species,
- (c) ecosystem diversity—the variety of communities or ecosystems. (Fisheries Mgt Act)

freshwater means water in a river or creek that is not subject to tidal influence:

- (a) including any body of freshwater that is naturally or artificially stored (such as a freshwater lake, lagoon, dam, reservoir, pond, canal, channel or waterway), but
- (b) not including any coastal lake that is intermittently open to tidal influence.

The regulations may, for the purpose of avoiding doubt about the application of this definition, specify the point at which any river, creek or other body of water becomes subject to tidal influence. (Fisheries Mgt Act)

habitat means any area occupied, or periodically or occasionally occupied, by fish or marine vegetation (or both), and includes any biotic or abiotic component. (Fisheries Mgt Act)

marine vegetation means any species of plant that at any time in its life must inhabit water (other than fresh water). Fisheries Mgt Act)

tree means a tree of any description and includes a sapling and a seedling of a tree. (LLS Act 2013)

Open Space: land that has no buildings or other built structures, which is accessible to the public, including green space. (GA Greener places draft policy)

Urban canopy: The layer of leaves, branches and stems of trees that cover the ground when viewed from above (GA Greener places draft policy)

Urban forest: the layer of trees and tree populations that exist in urban settings (GA Greener places draft policy)

More definitions may be available under Manly, Pittwater, Warringah, KRG, Hornsby, Penrith and Sutherland LEPs. If you would like new terminology included in the LEP and DCP, I suggest you talk to the planners.

Is there an agreeable size for 'Core Areas'? Does a minimum core size under value the importance of bushland in more urban areas?

Recommendation

1. I believe core needs to be defined based on structure and function with a size that maintains its viability. It needs to show signs of resilience and its condition should be good or fair.

Discussion

In the Bushland and Waterways Manual V3 p. 18 it was stated that core areas “tend to be of a size that maintains their viability and are generally larger than 3.5ha.”

This is not prescriptive and was targeted more for general bushland. It originates from Drinnan’s work. For instance, a small wetland may be below 3.5ha but be a functioning ecosystem that can be defined as core.

Our aim is to protect all core areas and prioritise their restoration and enhancement through not only planning controls but also through other Council land management mechanisms including POMs, grants, community engagement etc. If an area is defined as core, it is more likely to attract resources

for its management and political pressure for its protection. I am therefore reticent to cut the amount of core down based on the proposed criteria.

By having a total area of core for the LGA, you can use it as a measuring tool over time and to monitor if you have had no net loss. The more core in the beginning, the better the outcome as the area defined as support for core will be politically seen as areas that can be eaten into to i.e. sacrificed for development.

Therefore I caution too much prescriptiveness to define a core in terms of its size or interior section 60metres from the edge and being continuous, not bisected by significant barriers to fauna movement. Foreshore areas for instance adjoining major water bodies are adjoining a different habitat so I don't think it's fair to say it stops fauna movement when the birds and bats for instance may roost on the foreshore but fish in the water. Wide roads however are of course legitimate boundaries to movement but once again, many birds don't find them an obstacle. Perhaps you need to base these barrier assessments on what fauna you expect to use that core and their movement needs and mechanisms as well as elements that impact on resilience.

Is there a minimum acceptable width for corridors and / or perimeter buffers near core areas?

Recommendation

1. I don't believe so. It depends what is there and what is needed in terms of structure and function of the corridor for the long-term movement of target species. Some corridors may comprise only street trees in some built up areas.
2. Objectives of the corridors need to be identified which can inform corridor widths and in turn, planning controls
3. May like to consider having 3 corridor categories based on wide, moderate and narrow, like Sutherland Shire Council which has 4m, 30m and 80+ metres, noting that the wider the corridor, the greater suite of fauna can use it. Otherwise, use the 5 classes of corridor based on width following the BAM (0-5m, 6-30m, 31-100m, 101-500m, 500m+)

Discussion

I know of a site near the airport which had lantana along a canal which was colonised by lots of small birds that are locally rare. It was part of a green grid project to encourage walkability. This was good habitat for the birds yet the lantana was removed to make a pedestrian path and the birds were eliminated from that area. This indicates to me that even a very narrow strip of vegetation can provide very important habitat. It also indicates that if this habitat is not mapped, it can easily be removed for public projects as its habitat value was not documented.

How can we rely on common native indicator species for corridors? Can we use camera monitoring to address gaps in bionet recordings of non threatened species?

Recommendation

1. Need to use native indicator species that preferably have charisma e.g. pygmy possums, for public engagement and education purposes and are not seen as a pest.
2. Perhaps select a range of indicator species based on habitat and corridor width e.g. wide corridor along bushland or riparian area may be a wallaby. A medium width bushland corridor

could be suitable for e.g. echidna or sugar glider. A narrow bushy woodland or mesic corridor could be the blue wren or other small bird.

3. I believe using threatened species or locally rare species as indicator species could be a good option, especially when demonstrating, through monitoring, whether we are making a positive difference in recovery planning. It might also have more credibility when arguing cases in court, if the species is selected as relevant to that corridor, based on valid assumptions.
4. I encourage camera monitoring.

Discussion

People need to be motivated to “help” the species survive so small birds are generally more palatable. The issue there is they need bushy areas and this is what the fire management authorities try to remove bush fire prone areas that generally abut core. It would therefore be totally confusing for applicants to be told add bushes in your landscaping and then remove bushes for fire control.

Species such as ring tail or brush tail possums and brush turkeys are so wide spread across the landscape and don’t rely on ‘corridors’ for movement across the landscape. As some people believe they are pests, it would be best to find alternatives.

Would recent Lidar data be useful for the project?

Recommendation

1. I believe Lidar data can inform the height of the vegetation which would be useful in clarifying vegetation structure and possibly age.

Other issues raised from the review:

- Will locally rare species be included in species lists or mapping?
- Will there be consideration of vegetation types not well represented in the LGA?
- Critical winter foraging habitat needs to be mapped to inform the value of relevant vegetation and inform where new plantings are required to embellish supply
- A threatened species map will be useful but can it be a live map that informs categories, corridors and assessment processes? If live, it can be updated regularly if bionet is not reliable. If Council chooses to take on this mapping role for the Northern beaches, it should make sure the bionet site managers are aware of the map data. They need to be able to talk to each other.

SMEC discussion points:

I don’t feel I have the expertise to comment on the points raised by SMEC.