AGENDA

East Point Reserve Advisory Committee Meeting

Thursday, 16 May 2024

I hereby give notice that East Point Reserve Advisory Committee Meeting will be held on:

Date: Thursday, 16 May 2024

Time: 4:30 PM

Location: Meeting Room Bidjpidji (Meeting Room 1)
Level 1, Civic Centre
Harry Chan Avenue, Darwin

Simone Saunders

Chief Executive Officer

EAST POINT RESERVE ADVISORY COMMITTEE MEMBERS

Chairperson Councillor Mick Palmer
Birdlife NT Lou Martini
Crown Lands NTG Racheal Curtain
Darwin Military Museum Norm Cramp
Darwin Triathlon Club Gary Wall
Fannie Bay Equestrian Club Anja Zimmermann
Friends of East Point Helen Haritos
Larrakia Nation Ben Smith
Mindil Beach Life Savers NT Teresa Hall
Museum and Art Gallery of the NT Kirsten Abbott
Pee Wees Restaurant Simon Mathews
Researcher John Rawsthorne
Top End Native Plant Society Lon Wallis
Community Representative Ulrike Kachel
Community Representative Lorraine Corowa
Alternate Councillor Morgan Rickard

OFFICERS

Executive Manager Environment & Waste Services, Nick Fewster
Environment, Climate and Waste Support Officer, Elizabeth Gleeson
Manager Parks & Open Spaces, Lisa Spann

Order Of Business

1 MEETING DECLARED OPEN

2 APOLOGIES AND LEAVE OF ABSENCE

2.1 Apologies

THAT the apology from Member Enter name, be received.

2.2 Leave of Absence Granted

Nil

2.3 Leave of Absence Requested

Nil

3 ELECTRONIC MEETING ATTENDANCE

3.1 Electronic Meeting Attendance Granted

Nil

3.2 Electronic Meeting Attendance Requested

Nil

4 DECLARATION OF INTEREST OF MEMBERS AND STAFF

5 CONFIRMATION OF PREVIOUS MINUTES

East Point Reserve Advisory Committee Meeting - 15 February 2024

6 OFFICER REPORTS

6.1 TERMS OF REFERENCE REVIEW

Author: **Coordinator Environment and Climate Change**
Executive Manager Environment and Waste Services

Authoriser: **General Manager Innovation**

Attachments: **1. Terms of Reference Update May 2024** ⇩

RECOMMENDATIONS

1. THAT the East Point Reserve Advisory Committee recommend to Council the proposed changes to the Membership and Functions sections of the Terms of Reference at **Attachment 1**.

PURPOSE

The purpose of this report is to seek recommendation of the proposed changes to the Membership and Functions sections of the Terms of Reference at **Attachment 1**.

KEY ISSUES

- City of Darwin officers have conducted a review of the Membership and Functions sections of the Terms of Reference.
- The Terms of Reference currently lists 16 organisational members and two community members. This large number of members has meant that quorum has often not been met for meetings.
- City of Darwin officers have reduced the organisational members to eight, based on a review of past meeting attendance and consultation with members on their ability to attend future meetings.

DISCUSSION

City of Darwin officers have conducted a review of the Membership and Functions sections of the Terms of Reference and changes are presented at **Attachment 1** as track changes.

The change to membership involves the reduction of organisational members from 16 to eight. This is to address difficulties in obtaining quorum at meetings. The eight remaining organisational members is based on a review of past meeting attendance and consultation with members on their ability to attend future meetings.

Members that are no longer listed in the Terms of Reference will still be invited to meetings as Observers.

A small change is also made to the Functions, whereby the title of the *East Point Reserve Biodiversity Management Plan 2019-2024* is updated to the most recent version covering the period 2024-2029.

Following endorsement of the recommended changes, City of Darwin officers will incorporate these into the standard template for Council's approval.

PREVIOUS COUNCIL RESOLUTION

At the Ordinary Council Meeting held 16 June 2020, Council resolved as follows:

RESOLUTION ORD001/20

Moved: Alderman Andrew Arthur
Seconded: Alderman Justine Glover

1. That Council establish the East Point Reserve Advisory Committee, and that an inaugural meeting is held in September, 2020.
2. That Council invite the following organisations to form the committee membership:
    a. East Point Aero Modellers Club Inc.
    b. Fannie Bay Equestrian Club Inc.
    c. Pee Wee's at the Point
    d. Darwin Military Museum
    e. Friends of East Point
    f. Northern Territory Naturalist's Club
    g. Top End Native Plant Society
    h. Birdlife Top End
    i. NTG Department of Environment and Natural Resources
    j. Research organisations including CDU
    k. Larrakia Nation
    l. 1 Elected Member
    m. 2 Community representatives via expression of interest
    n. Museums and Art Galleries of the Northern Territory
3. THAT the East Point Reserve Advisory Committee establish a Terms of Reference at their first meeting for Council's approval in consultation with Council Officers, based on the following objectives:
    - Bring stakeholders together to share knowledge, experience and opportunities
    - Monitor the implementation of the East Point Reserve Biodiversity Management

	Plan 2019-2024 • Inform and advise Council of issues within and around the reserve
STRATEGIC PLAN ALIGNMENT	3 A Cool, Clean and Green City 3.1 By 2030, Darwin will be recognised as a clean and environmentally responsible city
BUDGET / FINANCIAL / RESOURCE IMPLICATIONS	Nil
LEGISLATION / POLICY CONTROLS OR IMPACTS	**Legislation:** Local Government Act 2019
CONSULTATION, ENGAGEMENT & COMMUNICATION	Nil
DECLARATION OF INTEREST	The report author does not have a conflict of interest in relation to this matter. The report authoriser does not have a conflict of interest in relation to this matter. If a conflict of interest exists, staff will not act in the matter, except as authorised by the CEO or Council (as the case requires).

GOVERNANCE

1 PURPOSE

The East Point Reserve Advisory Committee is an Advisory Committee. Its purpose is to provide advice to Council on matters outlined in the Committee's roles and functions. The Committee will provide recommendations to Council to enable an informed decision to be made on the management of East Point Reserve.

2 SCOPE

The East Point Reserve Advisory Committee operates to advocate, advise and support Council's approach to management of East Point Reserve in accordance with the East Point Reserve Biodiversity Management Plan.

The Committee will:

- Consider officer's reports and provide a recommended course of action to Council to determine matters related to the East Point Reserve; and
- Provide a forum to enable complex issues related to the East Point Reserve to be discussed at length or any other matters.

3 AUTHORITY / DELEGATION

The East Point Reserve Advisory Committee has the power only to recommend a course of action to Council and does not have any delegation to make decisions. The Committee is responsible for implementing the decisions of Council in accordance with the role and functions of the Committee.

4 FUNCTIONS

The functions of the East Point Reserve Advisory Committee are to:

a) Bring stakeholders together to share knowledge, experience and opportunities

b) Monitor the implementation of the East Point Reserve Biodiversity Management Plan ~~2019-2024~~2024-2029

c) Inform and advise Council of issues within and around the reserve or any other matters

CITY FOR PEOPLE. CITY OF COLOUR.

5 MEMBERSHIP

In accordance with the *Local Government Act 2019*, City of Darwin shall appoint suitably qualified individuals to be members of the Committee based on selection criteria related to their expertise, experience, dedication and commitment to the purpose of the group. Membership will consist of Council Members, organisations and community representatives as follows:

1 Council Member (1 alternative Council Member)

2 Community Representatives

The following organisations will be invited to be members of the Committee:

~~1. East Point Aero Modellers Club Inc.~~
~~2.~~1. Fannie Bay Equestrian Club Inc.
~~3. Pee Wee's at the Point~~
~~4. Darwin Military Museum~~
~~5.~~2. Friends of East Point
~~6. Northern Territory Naturalist's Club~~
~~7. Top End Native Plant Society~~
~~8.~~3. Birdlife Top End
~~9. NTG Crown Lands~~
~~10. NTG Weeds Branch~~
~~11.~~4. NTG NT Heritage Branch
~~12.~~5. Research organisations
~~13.~~6. Larrakia Nation
~~14.~~7. Museums and Art Galleries of the Northern Territory
~~15.~~8. Darwin Triathlon Club
~~16. Mindil Beach Surf Life Savers NT~~

Membership will expire if a member does not attend three consecutive regular meeting occasions without an approved leave of absence.

Representatives shall be nominated by a member organisation and are required to send a briefed alternate delegate should the nominee be unable to attend a meeting.

The Term of Membership for Community members is two (2) years. Community Members if absent are unable to send a proxy.

Observers with specialist skills and experience may also attend by invitation of the Committee and/or Council.

5.1 CHAIR

The chair of the committee will be appointed by Council.

The Committee Chair is responsible for:

- Ensuring the good conduct of meetings in accordance with the role and functions of the Committee; and
- Ensuring that the Committee's recommendations and actions are in line with the Terms of Reference.

The Committee Chair may be called upon to represent the Committee to Council.

The committee may appoint a Deputy Chair for the purposes of chairing a meeting if the Chair is not present or at a meeting as required.

5.2 MEMBERS

Members are appointed to represent the interests and needs of the community relevant to the committee purpose.

Organisational members are appointed to represent the interests and views of their member organization relevant to the committee purpose.

6 MEETINGS

6.1 FREQUENCY AND LOCATION

Subject to direction by Council, the Committee will set its meeting schedule the calendar year prior.

The Committee will meet at least four (4) times per year and no more than eight (8) times annually, between February and November.

Time and location of meetings is to be determined by the Committee.

Special meetings can be convened by the Chief Executive Officer on the request of the Chair, or a majority of committee members. The Chief Executive Officer will then issue a Notice of Meeting with the time, date and location of the meeting, and the items to be discussed at the special meeting.

6.2 VOTING

A resolution of the committee will be passed by a majority vote. A majority vote is half plus 1 of the members present at the meeting

The chair must exercise, in the event of an equality of votes, a second or casting vote.

7 CODE OF CONDUCT

All members are accountable to the *Local Government Act 2019* Code of Conduct, Schedule 1. This includes the requirement to declare gifts and/or benefits.

8 CONFLICT OF INTEREST

On appointment to a Committee, all members must identify if there are any conflicts of interest in performing their role on the committee.

Conflicts of Interest must also be identified at any meeting in which a member has a conflict of interest on a matter.

9 REVIEW AND PERFORMANCE EVALUATION

9.1 TERMS OF REFERENCE

The Terms of Reference will be reviewed annually by the Committee and any changes will be put to Council for endorsement.

9.2 PERFORMANCE EVALUATION

Commencing November 2022, at the end of each calendar year, the Committee will conduct an annual review of the Committee to assess outcomes against these terms of reference.

The review and any amendments to the Terms of Reference will be provided to Council at the commencement of each calendar year.

10 RESPONSIBILITY / APPLICATION

All members of the committee will be asked to sign the Terms of Reference as part of their induction to the committee, to ensure they are aware of their responsibilities under the *Local Government Act 2019* as member of a Council appointed committee.

These Terms of Reference were adopted by Council on 28 September 2021.

Name: _____

Signature: _____

6.2 EAST POINT RESERVE BIODIVERSITY MANAGEMENT PLAN 2024-2029 FEEDBACK

Author: **Coordinator Environment and Climate Change**
Executive Manager Environment and Waste Services

Authoriser: **General Manager Innovation**

Attachments: **1. East Point Reserve Biodiversity Management Plan 2024-2029** ⇩

RECOMMENDATIONS

1. THAT the report entitled East Point Reserve Biodiversity Management Plan 2024-2029 feedback be received and noted.

PURPOSE

The purpose of this report is to update the Committee on the progress of obtaining feedback and finalising the East Point Reserve Biodiversity Management Plan 2024-2029.

KEY ISSUES

- The East Point Reserve Biodiversity Management Plan 2019-2024 was due for renewal and update to include the findings of the recent East Point Reserve Fauna Survey 2023 and also the addition of fire management actions.
- The draft East Point Reserve Biodiversity Management Plan 2024-2029 (see **Attachment 1**) was emailed to Committee members for review and comment on 2 April 2024.
- Review of the document by City of Darwin officers was also undertaken.
- Feedback has been collated and provided back to the consultant for incorporation into the finalised plan.

DISCUSSION

The East Point Reserve Biodiversity Management Plan 2019-2024 was due for renewal and update to include the findings of the recent East Point Reserve Fauna Survey 2023 and also the addition of fire management actions.

The draft East Point Reserve Biodiversity Management Plan 2024-2029 (see **Attachment 1**) was emailed to Committee members for review and comment on 2 April 2024. Feedback was received from the Fannie Bay Equestrian Club, Friends of East Point, John Rawsthorne (Research organisations), and Ulrike Kachel (Community member).

Review of the document by City of Darwin officers was also undertaken.

Feedback has been collated and provided back to the consultant for incorporation into the finalised plan.

PREVIOUS COUNCIL RESOLUTION

Nil

STRATEGIC PLAN ALIGNMENT	3 A Cool, Clean and Green City 3.1 By 2030, Darwin will be recognised as a clean and environmentally responsible city
BUDGET / FINANCIAL / RESOURCE IMPLICATIONS	Budget and resource implications were considered as part of the review undertaken by City of Darwin officer's and this does not significantly change from the resourcing required for the current 2019-2024 plan.
LEGISLATION / POLICY CONTROLS OR IMPACTS	**Legislation:** The East Point Reserve Biodiversity Management Plan 2024-2029 assists with maintaining compliance with the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth) and Territory Parks and Wildlife Conservation Act 1976 (NT) in regards to threatened species listed nationally and for the Northern Territory. Weeds Management Act 2001 (NT) in regards to controlling declared weeds under the Act.
CONSULTATION, ENGAGEMENT & COMMUNICATION	Nil
DECLARATION OF INTEREST	The report author does not have a conflict of interest in relation to this matter. The report authoriser does not have a conflict of interest in relation to this matter. If a conflict of interest exists, staff will not act in the matter, except as authorised by the CEO or Council (as the case requires).

East Point Reserve Biodiversity Management Plan 2024 – 2029

CITY OF DARWIN

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EcOz Environmental Consultants

DOCUMENT CONTROL RECORD

Job	EZ23047
Document ID	226579-158
Author(s)	Ruth Marr, Nicole Clark and Laura Zaharie

DOCUMENT HISTORY

Rev	Reviewed by	Approved by	Issued to	Date
1	Glen Ewers	Glen Ewers	Emma Smith	27/3/24

Recipients are responsible for eliminating all superseded documents in their possession.

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Acknowledgements

Thanks to the following people for photos, discussion and input into the plan:

- Emma Smith, Elizabeth Gleeson and Jamie Lewis (City of Darwin)
- Graeme Sawyer (BiodiversityWatch)
- Chris Jolly (Macquarie University)
- Jules Farquar and Jordan Mulder (University of Melbourne)
- Dan Edwards (Museum and Art Gallery of the Northern Territory).

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1 INTRODUCTION

East Point Reserve (henceforth referred to as the 'reserve') is ~190 hectare reserve managed by the City of Darwin. The reserve supports significant environmental, recreational and historical values – including monsoon rainforest vegetation, a constructed lake, a military museum and heritage sites, an equestrian club, a restaurant and a model airplane club. The reserve is known for its important ecological values – including the large patch of remnant and revegetated monsoon forest and the presence of threatened species that have disappeared and/or declined elsewhere in Darwin and the Top End. These include the Northern Blue-tongued Skink (*Tiliqua scincoides intermedia*), Yellow-Spotted Monitor (*Varanus panoptes*), Northern Brushtail Possum (*Trichosurus vulpecula arnhemensis*) and migratory shorebirds. The marine, coastal and adjoining terrestrial environments are recognised for their importance as part of the Darwin Harbour Site of Conservation Significance (SOCS).

These biodiversity values of the reserve – and their management – must be considered in the context of the various land uses and stakeholders for the reserve. EcOz have been engaged by the City of Darwin to review the previous Biodiversity Plan for East Point Reserve (SLR 2018) and update the 'Plan' for the period encompassing 2024-2029. The updated Plan will support the City of Darwin to continue their work in maintaining and improving the biodiversity values of the reserve, and provide clear guidance on the priority values and actions.

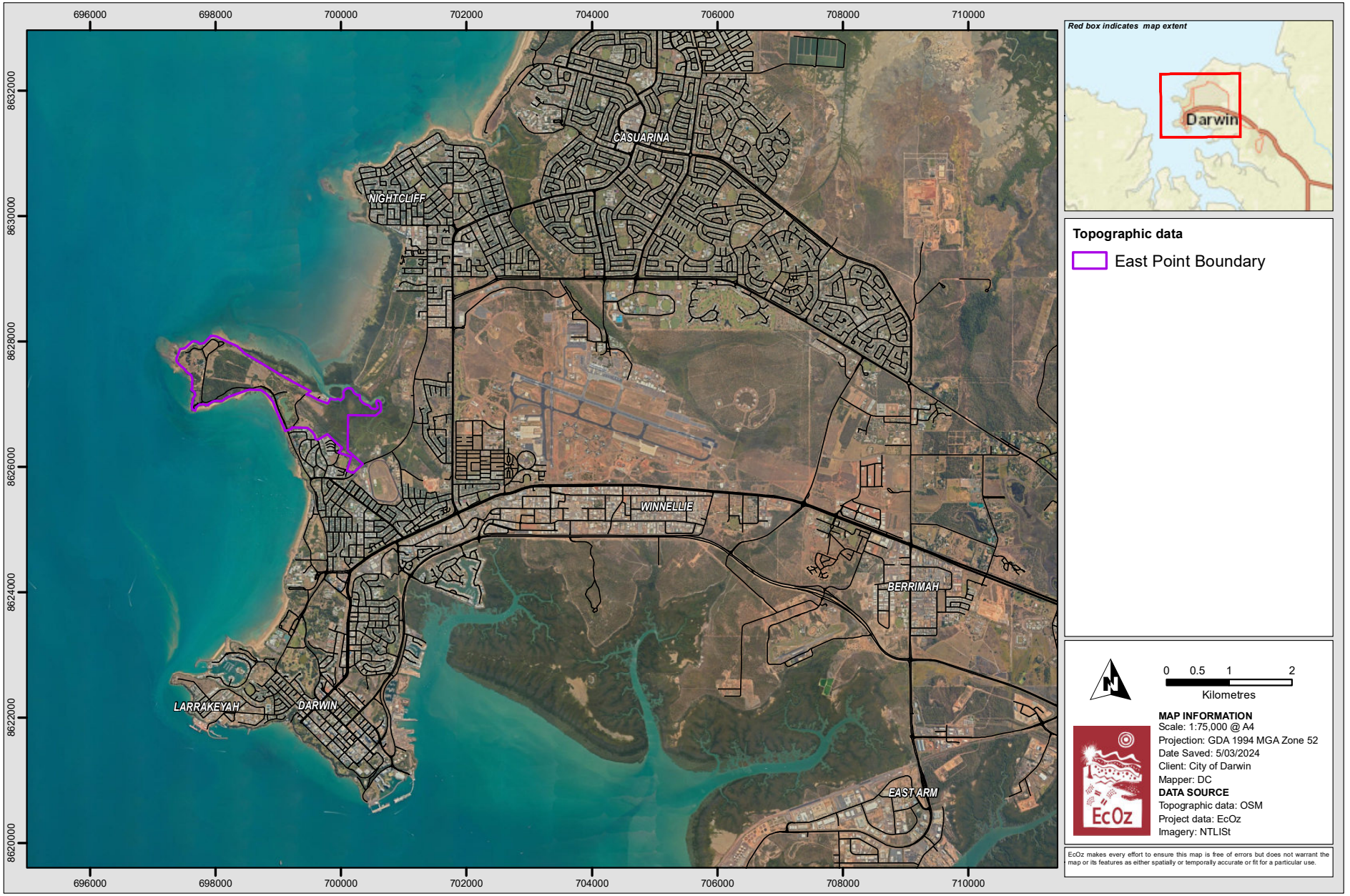
The East Point Reserve Biodiversity Management Plan (2024-2029) updates and builds upon the previous Biodiversity Plan (SLR 2018) based on contemporary information on values and threats collected over the last five years – e.g. the East Point Cane Toad Management Plan (EcOz 2022), a revegetation / weed monitoring report (EcOz 2021) and fauna surveys (EcOz 2023). This updated plan incorporates new sections that address management of fire, domestic animals, and education and research opportunities. The plan focuses on the terrestrial flora and fauna values only.

The objectives / goals of the 2024-2029 East Point Reserve Biodiversity Management Plan are to:

- Protect, and enhance biodiversity values, including populations of threatened species.
- Control and, where possible, eliminate threatening processes.
- Maintain and, where possible, enhance habitat connectivity.
- Engage, educate and promote the biodiversity values and nature-based recreational activities within the reserve.
- Collaborate with key stakeholders and experts to deliver key management outcomes and support research opportunities.
- Monitor, map and analyse biodiversity condition to inform future decision making.
- Maintain and manage multiple land uses within the reserve and minimise their impacts on key biodiversity values.

2 SITE CONTEXT

The reserve is located on Lot 5775 (Town of Darwin), 6 km from the Darwin CBD (Figure 2-1). The reserve is located on a peninsula that is bounded by the Timor Sea to the north, Darwin Harbour to the west, the highly-urbanised suburb of Fannie Bay to the south, and to the east by Ludmilla Creek and Vacant Crown Land supporting remnant coastal and terrestrial vegetation that extends to Nightcliff. The reserve is situated within the Darwin Harbour SOCS, considered of international significance due to the extensive mudflats, diverse mangrove environments, marine fauna and adjoining terrestrial values) (Harrison et al. 2009).



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ23047 - East Point Biodiversity Management Plan Review\1. Project Files\2. Report Maps\Map of the location of East Point Reserve.mxd

Figure 2-1. Map of the location of East Point Reserve

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2.1 Current land use

The reserve currently supports recreational and conservation land uses and has leases for specific recreational and commercial activities (Figure 2-2). The broad land uses are categorised and listed below:

- Conservation – the reserve supports diverse native flora and fauna species, remnant terrestrial vegetation and coastal communities (e.g. mangroves, rocky shelves and cliffs and intertidal mudflats).
- Council infrastructure – the East Point depot and green waste recycling facility is located within the reserve.
- Recreation – the reserve includes a network of trails used by walkers, cyclists, and horse riders. These trails go around the perimeter of the reserve as well as through native vegetation. Lake Alexander is also a popular site for swimming, canoeing and BBQ's. There are multiple fishing locations along the coastline.
- Education and biodiversity monitoring – the reserve is frequented on a regular basis by volunteers that monitor threatened and vulnerable reptiles, undertake Cane Toad 'busts' and shorebird counts. The 5 km science trail incorporates interpretive signage that is useful for public education and engagement.
- Leasehold land – community leasehold land includes the Fannie Bay Equestrian Club and the East Point Aeromodellers Club. Pee Wees at the Point is a commercial restaurant.
- Commonwealth land supporting the Darwin Military Museum and other heritage sites.

The reserve is serviced by a network of sealed and unsealed roads, walking paths, and shared bicycle / walking / horse trails. The main vehicle access gate located on Alex Fong Lim Drive is locked between 9:30 pm and 5:00 am on weekdays, and 10:30 pm and 5:00 am on weekends. Management vehicles can access the network of internal dirt tracks through locked gates to allow management / maintenance activities within the reserve (see Figure 5-4).

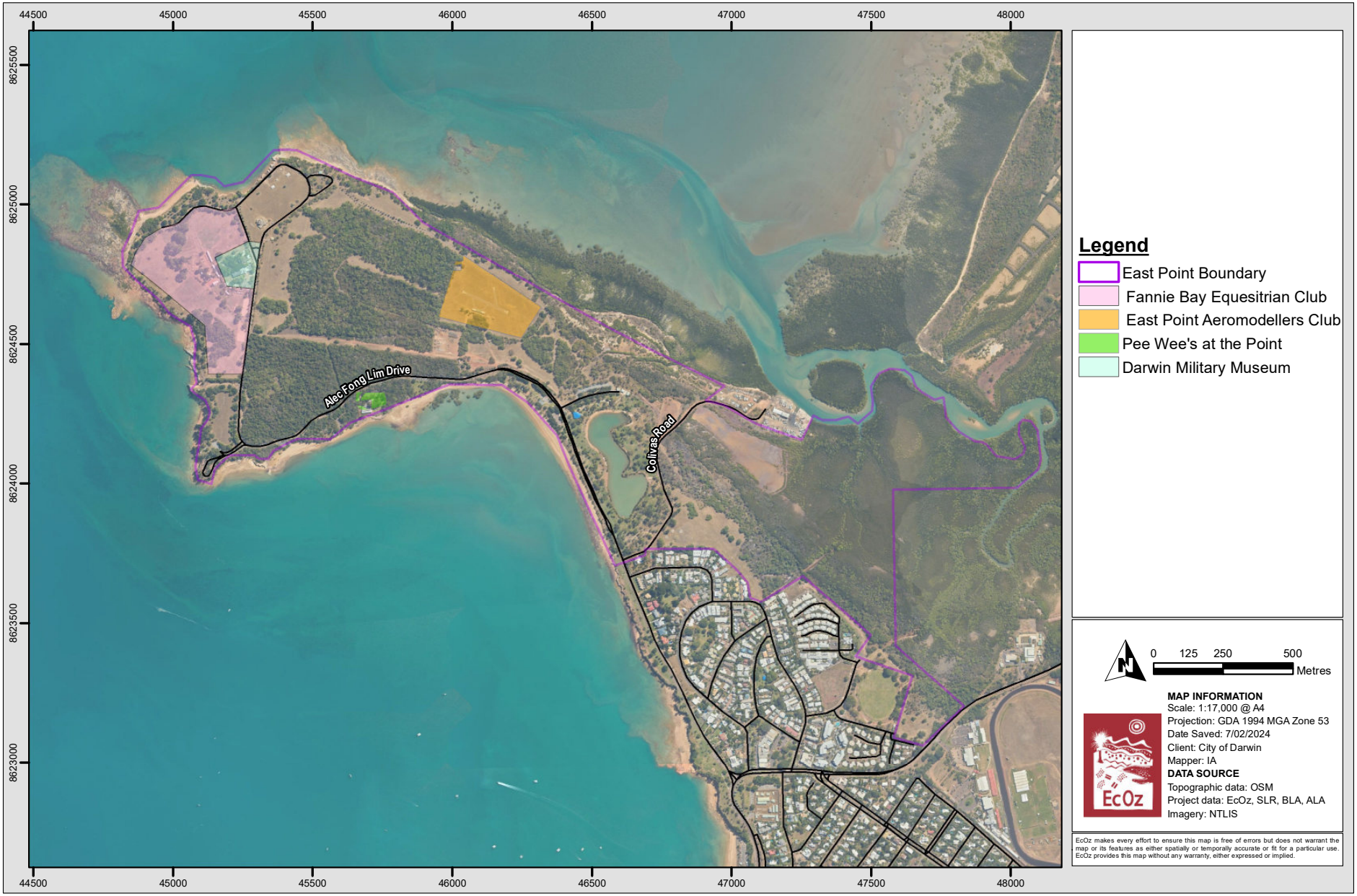


Figure 2-2. Map of East Point Reserve land use

3 MANAGEMENT FRAMEWORK

3.1 Relevant policy and legislation

A summary of the legislation, policy and guidelines relevant to this management plan in a national, state, regional and local context is provided in Appendix A. It covers the relevant legislation/policy, the scope of the legislation/policy, when it applies and its relevance to the management of the reserve.

3.2 Relevant National, Territory and regional strategies and plans

The East Point Biodiversity Management Plan was prepared with reference to the following National, Territory and regional plans:

- National Threatened Species Strategy 2021-2031 (DCCEEW, 2021).
- Threat Abatement Plan for the Biological effects, including lethal toxic ingestion, caused by Cane Toads (DCCEEW, 2021).
- Threat Abatement Plan to reduce the impacts on northern Australia's biodiversity by the five listed grasses (DCCEEW, 2012).
- Draft Threat Abatement Plan for Predation by Feral Cats (TAP) (DCCEEW, 2023).
- Australia's Strategy for Nature 2019-2030, Commonwealth of Australia 2019.
- Australian Weeds Strategy 2017 – 2027 (DCCEEW, 2017).
- Australian Pest Animal Strategy 2017 – 2027 (DCCEEW, 2017).
- Darwin Regional Weeds Strategy 2021-2026 (DEPWS, 2021).
- Greening Darwin Strategy 2030 (City of Darwin, 2021)
- East Point Cane Toad Management Plan (EcOz 2022).
- Conservation advice for key threatened species:
    - Northern Blue-tongued Skink (*Tiliqua scincoides intermedia)* (DCCEEW 2023).
    - Mitchell's Water Monitor (*Varanus mitchelli*) (DCCEEW 2021).
    - Yellow-spotted Monitor (*Varanus panoptes*) (DEPWS 2012).
    - Northern Brushtail Possum (*Trichosurus vulpecula arnhemensis)* (DCCEEW 2021).
    - Atlas Moth (*Attacus wardi*) (DEPWS 2021).

3.3 Responsibility

The responsibility to implement the Biodiversity Management Plan sits with the Manager of Infrastructure Maintenance (City Operations) and the Manager for Climate Change and Environment (City Futures). Leaseholders and other stakeholders (listed in the next section) should be engaged by Council to implement the plan actions as required.

3.4 Key stakeholders

East Point Reserve has a broad and varied group of stakeholders with interests in the reserve and its management. The City of Darwin will engage within these stakeholders during the development of this plan and provide an opportunity for feedback on the proposed updates and actions. The East Point Reserve Advisory Committee was formed in 2021 to bringing together key stakeholders including indigenous community representatives and biodiversity specialists with the purpose of connecting the Council, stakeholders and the community to share knowledge, experience and opportunities. A key role of the advisory committee is to monitor the implementation of the Biodiversity Management Plan and to identify and inform the Council of issues within and around the Reserve (City of Darwin, 2021). The advisory committee consists of:

- One Council Member.

- Community Representatives made up from numerous leaseholders and reserve users, including:
    - East Point Aero Modellers Club Inc.
    - Fannie Bay Equestrian Club Inc.
    - Pee Wee's at the Point
    - Darwin Military Museum
    - Friends of East Point
    - Northern Territory Naturalist's Club
    - Top End Native Plant Society
    - Birdlife Top End
    - NTG Crown Lands
    - NTG Weeds Branch
    - NTG NT Heritage Branch
    - Research organisations
    - Larrakia Nation
    - Museums and Art Galleries of the Northern Territory
    - Darwin Triathlon Club
    - Mindil Beach Surf Life Savers NT.

Biodiversity Watch, a community led, non-for-profit organisation is also a stakeholder for the reserve with long-term voluntary monitoring of Cane Toads (*Rhinella marina*), Yellow-spotted Monitor and other reptile species.

3.5 Funding

Implementation of the plan will be funded by the City of Darwin and external funding. Potential external funding sources may include:

- Territory and Federal grants (see (https://help.grants.gov.au/ and (https://depws.nt.gov.au/environment-information/funding-for-environment-projects/environmentgrants).
- Sponsorships from local businesses and industry.
- Resources pooled in partnership with NTG, non-government organisations (e.g. Territory NRM, Larrakia Rangers), not-for-profit (e.g. Birdlife Australia) and research institutions.
- The Biodiversity Offset Policy under the Northern Territory's Offset Framework may present an opportunity to utilise the reserve as an offset for approved impacts elsewhere.
- The Commonwealth Government's new *Nature Repair Act 2023* (NR Act) may present an opportunity for Council to seek funds for the management of East Point through a national, voluntary biodiversity market. Further information on the Nature Repair Act and market can be found at: https://www.dcceew.gov.au/environment/environmental-markets/nature-repair-market.

4 BIODIVERSITY VALUES

East Point Reserve and the immediate surrounds supports a diversity of vegetation communities and habitats (e.g. monsoon forest, woodland, mangroves and intertidal areas, modified grassy environments and an artificial wetland – Lake Alexander) that support a range of flora and fauna species. A complete list of flora species is not available for the reserve. Recent fauna surveys have identified a total of 266 fauna species, comprising 212 bird, four amphibian, 20 mammal, and 30 reptile species that have been previously recorded, including numerous threatened species (DEPWS 2023, EcOz 2013, DLRM 2016, and EcOz 2023). A comprehensive list of species previously recorded within the reserve is included in Appendix B.

A summary of the native vegetation / habitat values, significant fauna species and key non-threatened / iconic species are discussed below and their relevance to reserve management. Note, there are no records of threatened flora species within East Point Reserve, thus these are not addressed in this plan.

4.1 Native vegetation

4.1.1 Monsoon forest

Throughout the Top End, there are small patches of monsoon rainforest scattered within a vast area dominated by eucalypt savannah (Russel-Smith and Lee 1992). This community is characterised by a dense canopy of mixed species with a large proportion of deciduous plants and vines. Monsoon rainforests are regarded as significant vegetation under the Land Clearing Guidelines in the NT due to the spatially-restricted distribution and the unique and/or inherently high biodiversity values (DEPWS 2021).

Monsoon forest historically covered the East Point Peninsula. Much was cleared for military purposes (prior to 1945), followed by construction of a golf course (between 1955 and 1963). The remaining monsoon forest was impacted by Cyclone Tracey (Franklin, Matthews, and Lawes, 2010). Restoration of the monsoon forest commenced in 1974 by the Northern Territory Government (NTG) and continued after the reserve was transferred to Darwin City Council in 1984. Currently, the monsoon forest covers 28.4 ha within the reserve, with approximately 13.4 ha of remnant monsoon vegetation – see Figure 4-1 .The current extent of monsoon forest should be maintained, and further expansion of patches is not recommended – see Section 4.3 (this is because it conflicts with the habitat requirements for key threatened species, e.g. open grassland areas critical for the Yellow-spotted Monitor).

The monsoon forest patches within East Point Reserve provide habitat for a range of fauna including EPBC-listed Northern Brushtail Possum, potential habitat for TPWC-listed Atlas Moth, habitat for a diverse range of bird species (some restricted to this habitat e.g. Rainbow Pita), and shelter for Agile Wallabies.

Monsoon vegetation monitoring history

Ongoing monitoring of revegetation health and condition within the monsoon forest is a key component of biodiversity management for the reserve. The previous 2019 – 2024 Biodiversity Management Plan (SLR 2018) for the reserve included revegetation monitoring and recommendations are included within this updated plan to continue monitoring the health and condition of vegetation every three years, using the established methodology. Baseline vegetation monitoring was carried out in 2014, with follow up monitoring undertaken in 2017 and 2021 (EcOz 2015, EcOz 2017b, EcOz 2021). The next monitoring event is due to be undertaken in the dry season of 2024. Vegetation monitoring sites are shown in Figure 4-1 and are spread across the monsoon forest to give a broad range assessment of various revegetation areas across the reserve. The general location of each new site was pre-selected by the City of Darwin and aimed to investigate vegetation health and growth as a result of planting age and different site preparations (i.e. length of time mulched and left to decompose may be beneficial to ongoing development and success of revegetation). Recommendations associated with on-going monitoring are provided in the Implementation schedule.

4.1.2 Woodland (breezeway)

The reserve supports ~8.4 ha of modified woodland habitat referred to as the 'breezeway' that connects to the Fannie Bay Reserve (Figure 4-1). Land unit mapping available on NR Maps ((Fogarty et al. 1984) suggests that this area supports native vegetation attributed to land units: 4c (open forest of *Eucalyptus* spp. over mixed grasses; wet season watertable) and 3c (woodland of *Eucalyptus miniata*, *Eucalyptus tetrodonta* over Sorghum spp.) [1]. The breezeway has been progressively revegetated by the Friends of East Point focusing on planting of woodland species that provide habitat and food resources for fauna. The area currently comprises *Corymbia polysciada/ Corymbia polycarpa* open woodland over a tussock grassland and small pockets of monsoon forest species. While the Friends of East Point would like to continue planting, it is recommended that additional

[1] A land unit is a reasonably homogenous part of a land surface, distinct from surrounding terrain with consistent properties in landform, soil and vegetation (Jessop & King 1997). As such, each land unit has a characteristic pattern on aerial imagery. These are at a significantly smaller scale than a bioregion (i.e. bioregions constitute many different land systems). Their scale is useful for identifying habitat features that may support threatened species and sensitive vegetation types. Land unit mapping is available East Point Reserve and are described at a scale of 1:25,000 in Land Resources of the Elizabeth, Darwin and Blackmore Rivers (Fogarty et al. 1984).

plantings must take into account the flora species suited for the particular vegetation community present and the fire management requirements adjacent to the residential areas.

4.1.3 Open modified grassland

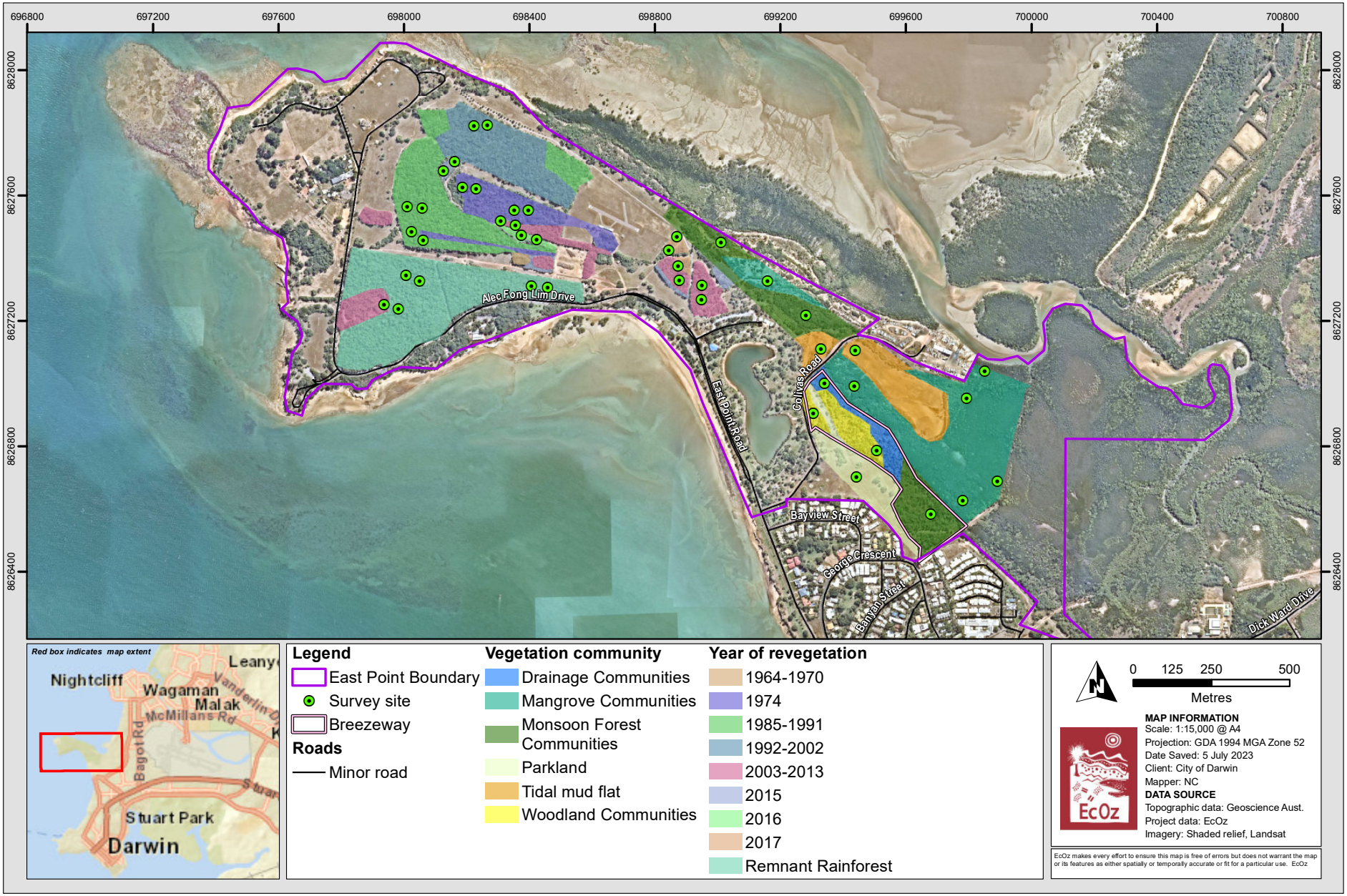
The reserve supports modified open grassy areas that are used for recreation but also provide habitat (e.g. food and shelter resources) for fauna including the threatened Yellow-spotted Monitor and the iconic Frilled Lizard and other common fauna species such as Agile Wallabies. These grassy areas have been primarily managed by the City of Darwin for landscape amenity, weed control and fire management.

Consideration to a modified management regime within this habitat are provided below – undertaking a trial modification to mowing regimes so that multiple unmown wide grassy strips are retained throughout the reserve (50 cm high, and 30 m wide) to increase habitat values and promote invertebrate diversity and abundance that may provide an enhanced food source for Yellow-spotted Monitors and other reptiles species (e.g. Northern Blue-tongued Skinks, Frilled Lizards and other fauna species), provide shelter from environmental conditions and predators and may also discourage Cane Toads from moving through dense grassy vegetation (see also Section 4.3).

4.1.4 Mangroves

Mangroves occur in the NT along sheltered coastlines, growing in tidal areas frequently inundated by salt water, and are associated with estuaries, sheltered embayments, and tidal rivers. This vegetation type contains many unique and highly specialised animals and plants, including many species restricted to these environments (DENR 2018c). Mangrove habitats provide spawning and nursery areas for many marine species and protect the coastline from erosion during storm surges and cyclones (DENR 2018c).

At East Point Reserve, mangroves are located adjacent to the reserve. Council manages land that buffers the mangroves and supports shared paths, maintenance access tracks and modified grassy habitats. Mangroves adjacent to the reserve may support a small population of Critically Endangered Mitchell's Water Monitor and many other mangrove-dependant flora and fauna species.



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ23047 - East Point Biodiversity Management Plan Review\1. Project Files\2. Report Maps\Vegetation and habitat types within and surrounding East Point Reserve.mxd

Figure 4-1. Vegetation and habitat types within and surrounding East Point Reserve

4.2 Habitat connectivity

East Point Reserve has a low to moderate connectivity due to its location within the City of Darwin municipality. The reserve is directly connected to habitats along the northern coastline, with mangroves, grasslands, monsoon and small patches of woodland vegetation within Ludmilla and through to Coconut Grove. However, there from Coconut Grove, there is low connectivity through to Rapid Creek Reserve and beyond to Casuarina Coastal Reserve that is restricted to the narrow strips of coastal vegetation, beaches, rocky cliffs adjacent to high density residential areas and high use recreation zones. Terrestrial connectivity to the south of East Point is also highly restricted due to the highly-urbanised land uses.

4.3 Significant fauna

East Point Reserve supports a high diversity of fauna species that inhabit the various terrestrial, coastal and marine habitats. The reserve provides a critical refuge for many significant fauna species including threatened and migratory species listed under Commonwealth (*Environmental Protection and Biodiversity Conservation* (*EPBC) Act)* and/or NT (*Territory Parks and Wildlife Conservation Act*). A comprehensive likelihood of occurrence for threatened and migratory species is not provided within this plan. However, species listed as threatened (vulnerable endangered, or critically endangered under the EPBC Act or TPWC Act) and known to occur or with a high likelihood of occurrence are discussed in this section of this plan – i.e. based on the suitability of habitat and recent proximate records. Some threatened species previously recorded (e.g. Black-footed Tree-rat recorded in 2014) are not discussed within this section due to having a lower likelihood of occurrence – i.e. despite records of this species with monsoon forest, this habitat provides lower suitability for this species compared to savanna woodland and is unlikely to sustain a resident population. Further, this species was not detected in targeted camera surveys in 2016 and 2023 (DLRM 2016, EcOz 2023).

Northern Blue-tongued Skink

The Northern Blue-tongue Skink (*Tiliqua scincoides intermedia)* (Figure 4-2) is listed as Critically Endangered under the *EPBC Act* (effective 21/12/23). A large, ground-dwelling, short-limbed skink that occurs in a variety of habitats across the wet-dry tropics of northern Australia with most records proximate to water (Shea 1992; AWC unpublished data; DAC unpublished data; WAC unpublished data). They are reliant upon dense shrubs and grasses, deep leaf litter, burrows, and under built structures and discarded household items for shelter.

Historically, the Northern Blue-tongue Skink was common across the Top End, and was frequently sighted in Darwin. However, recent research identified a significant population decline associated with ingestion of Cane Toads (Jolly et al. 2023, Price-Rees, Brown & Shine 2010). Other threats include pest animals (including predation by cats), fire, habitat destruction and degradation, illegal collection for the pet trade and traditional hunting (DCCEEW 2023).

The reserve supports a small population of Northern Blue-tongued Skinks, with the most recent record of this species in 2023 (Graeme Sawyer, BiodiversityWatch, pers. comm.).

EcOz Environmental Consultants

Figure 4-2. Photograph of Northern Blue-tongue Lizard (taken by Ruth Marr)

Mitchell's Water Monitor

Mitchell's Water Monitor (*Varanus mitchelli*) is a diurnal, semi-aquatic and arboreal medium-sized monitor (Figure 4-3) that is classified as Critically Endangered under the *EPBC Act* (effective 21/12/23) and Vulnerable under the *TPWC Act*. Mitchell's Water Monitor inhabits seasonal and permanent freshwater and saline watercourses and wetlands in Northern Australia (DEPWS 2021, Doody et al. 2009, 2015; de Laive et al. 2021; Wilson & Swan 2021; AWC unpublished data). Mitchell's Water Monitor has a strong association with Pandanus and other woody vegetation directly adjacent to waterbodies that it uses for shelter and basking(Wilson & Knowles 1988; Doody et al. 2009, 2015; de Laive et al. 2021; AWC unpublished data).

Mitchell's Water Monitor is highly vulnerable to Cane Toad toxin (Smith & Phillips 2006; Ujvari et al. 2013) with severe population decline and local extinction since their invasion (DCCEEW 2023). Habitat critical to the survival of Mitchell's Water Monitor includes all areas where this species persists following the establishment of Cane Toads (DCCEEW 2023).

There are six records of Mitchell's Water Monitor from or directly adjacent to East Point Reserve (DCCEEW 2023). These include three records in 2017 at the end of Colivas Road in association with Ludmilla Creek and another in proximity in 2016.

Figure 4-3. Photograph of a Mitchell's Water Monitor (taken by Chris Jolly, Macquarie University)

Yellow-spotted Monitor

The Yellow-spotted Monitor (*Varanus panoptes*) is listed as Vulnerable under the *TPWC Act*. This species is a large, robust ground-dwelling monitor that can grow up to 1.4m, occupying a variety of habitats, including coastal beaches, floodplains, grasslands, and woodlands. This carnivorous species consumes a wide variety of prey, consisting of invertebrates, small reptiles, frogs, mammals and carrion (Cross et al. 2020). Yellow-spotted Monitors have experienced severe decline and even local extinctions in some areas since the invasion of Cane Toads (Ward et al. 2012, Doody et al., 2006, Pettit et al. 2021).

A small population of Yellow-spotted Monitors are present within East Point Reserve, with monitoring over the last decade by Graeme Sawyer (BiodiversityWatch). Based on the BiodiversityWatch survey data, this species

has decreased from roughly 16 individuals in 2013 to about four to five individuals in 2015, which then increased to twelve juvenile individuals recorded in 2023 – all individuals are considered likely to come from the same cohort (see Figure 4-4 and photos of trapping method and juvenile monitor in Figure 4-5). The 2023 monitoring surveys did not record any adult monitors, but a single deceased gravid adult female was recorded within East Point in May 2023 – the injuries reported indicate a deliberate human attack (Graeme Sawyer, pers. comm.). In addition to the monitoring undertaken by BiodiversityWatch, recent fauna surveys in September / October 2023 detected juvenile Yellow-spotted Monitors on two separate camera traps (EcOz 2023). Yellow-spotted Monitors are predominantly utilising the cleared grassland habitats around the remnant monsoon forest, the cleared paddocks around the Fannie Bay Equestrian club, artificial structures for shelter (e.g. the old defence structures and buildings) and the coastal environments and banks for burrows / egg laying. In particular, higher numbers of monitors appear to be detected within the Fannie Bay Equestrian Club likely due to the higher food resources (e.g. beetles and other invertebrates) associated with horse dung.

As with other populations, the decline of the East Point population is primarily linked to Cane Toad poisoning (DLRM 2016b, Graeme Sawyer pers. comm.). While adult and larger sub-adult Cane Toads are present, there are no metamorphs or small juvenile Cane Toads due to the lack of freshwater breeding sites within the reserve. These smaller Cane Toads are easy prey and present an extreme risk to multiple species vulnerable to their impacts (monitors but also Frilled Lizards, Northern Blue-tongue Skinks and snakes). However, larger varanids are able to predate upon larger Cane Toads that are present within the reserve, and this may be linked to the apparent very low density of adult Yellow-spotted Monitors present within the reserve. While reproduction and recruitment into the population is still occurring, the effective population size is unknown. Other threatening processes such as predation by dogs and cats, traffic collision, and potential predation by people are also implicated in individual mortality within the reserve and across their range (DLRM 2016a).

The small population of Yellow-spotted Monitors within East Point Reserve, along with the few remaining within the Casuarina Coastal Reserve, represent the last known population within the greater Darwin area and are thus highly significant and an iconic value of reserve. The Flora and Fauna Division of the Department of Environment, Parks, and Water Security regard the remaining population of Yellow-spotted Monitors at East Point Reserve as significant given their substantial declines elsewhere across their range and recommend that further information on population trends and causes of mortality are investigated (DLRM 2016a). Genetic research has been proposed to be undertaken by BiodiversityWatch and supported by the Museum and Art Gallery of the Northern Territory (MAGNT) and would provide insight into genetic variation, overall trends in the population and identify whether the East Point population is connected or isolated from others within the greater Darwin area. Consideration should be given to collaboration with research institutions to radio-track individuals, gathering information on home range, time budgets, distances travelled, social behaviour, location of nesting / denning, dispersal routes, survival rates, diet and foraging behaviour and causes of mortality. Monitoring surveys should aim to estimate population abundance and trends across years. Council can utilise this data along with other stakeholders to inform management and investment in conservation of this species within the Darwin area.

Management of threats is also a critical component of conserving this species, including the implementation of the Cane Toad Management plan (EcOz 2022). Further considerations for management within the reserve are provided below – undertaking a trial modification to mowing regimes so that multiple unmown wide grassy strips are retained throughout the reserve (50 cm high, and 30 m wide) to increase habitat values of grassy areas and promote invertebrate diversity and abundance that may provide an enhanced food source for Yellow-spotted Monitors and other (e.g. Northern Blue-tongued Skinks, Frilled Lizards and other fauna species), provide shelter for fauna from environmental conditions and predators and may also discourage Cane Toads from moving through dense grassy vegetation (see also Section 4.1). Findings from monitoring surveys and genetic analysis should be used to inform management actions within the reserve and more broadly across the region.

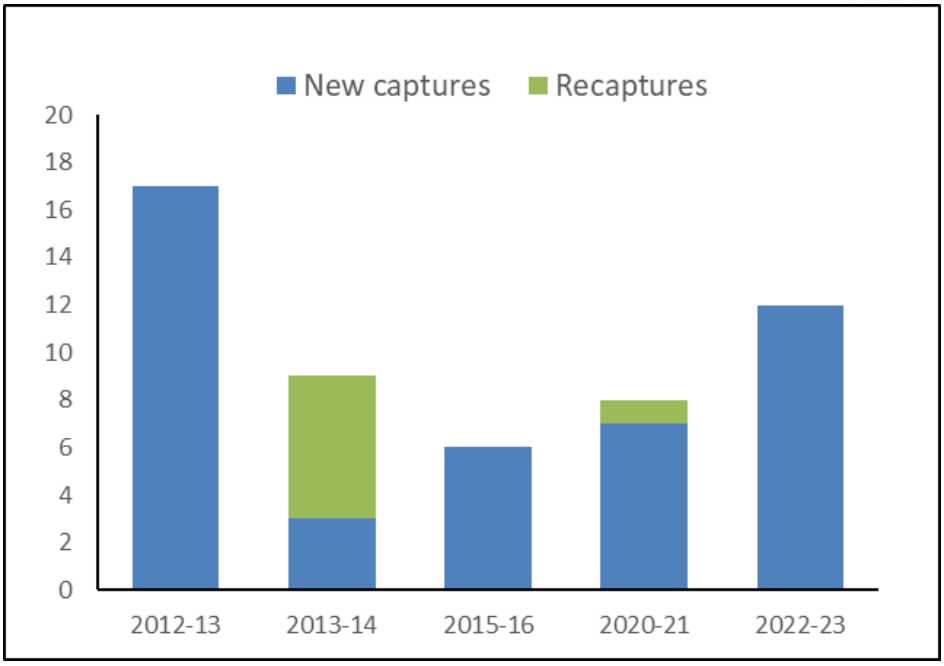


Figure 4-4. Captures of Yellow-spotted Monitors within East Point Reserve between 2012 and 2023 (Graeme Sawyer, BiodiversityWatch).

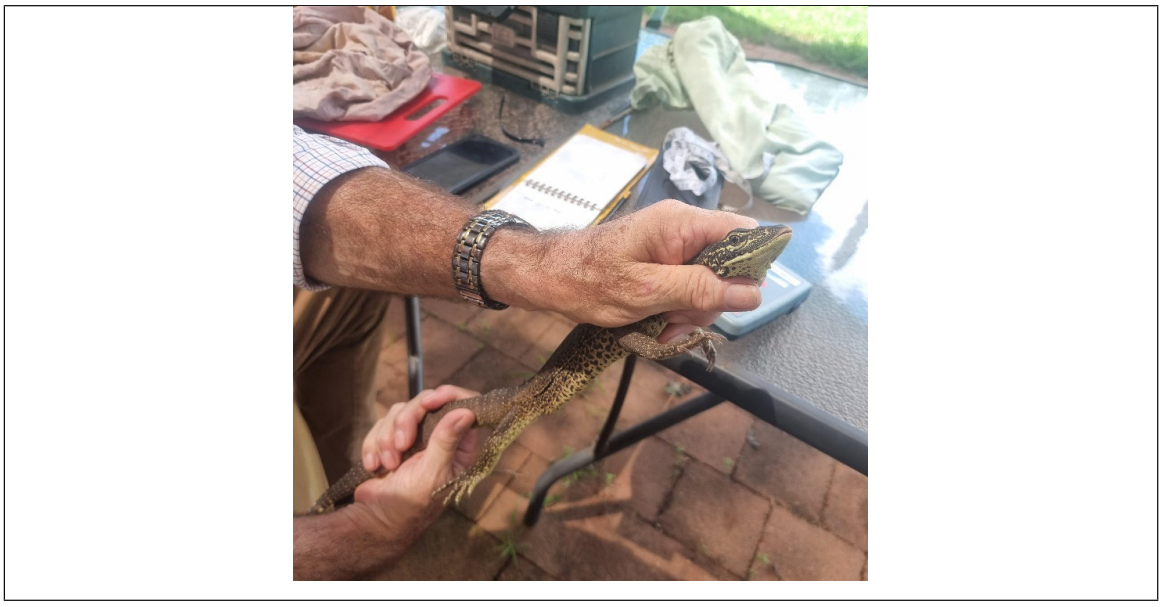


Figure 4-5. Photograph of a Yellow-spotted Monitor captured during the 2023 BiodiversityWatch monitoring (taken by Ruth Marr)

Northern Brushtail Possum

The Northern Brushtail Possum (*Trichosurus vulpecula arnhemensis)* is listed as Vulnerable under the *EPBC Act*. This species is a nocturnal semi-arboreal marsupial that occurs discontinuously from the Gulf of Carpentaria hinterland near Borroloola in the Northern Territory, to the Kimberley in Western Australia (Morris et al. 2016). The Northern Brushtail Possum mainly inhabits tall eucalypt open forests and woodlands with large hollow-bearing trees and a diverse and relatively dense mid-storey of fruiting and flowering small trees and shrubs, but also occurs in mangrove communities (especially where there are hollow-bearing trees), rainforests and semi-urban areas, particularly around Darwin (TSSC 2021).

The broadscale decline of the subspecies' populations and reduction of its range is largely attributed to inappropriate fire regimes, feral cat predation and habitat modification from invasive grasses – particularly Gamba Grass (*Andropogon gayanus*) and Mission Grass (*Cenchrus polystachios*) and pest animal species (Stobo-Wilson et al. 2019; TSSC 2021).

The population of Northern Brushtail Possum in urban areas around Darwin has not experienced the same decline as other areas across the Top End and may be significant from a conservation perspective. While there are no population estimates of this species within the reserve, recent fauna surveys (EcOz 2013, DLRM 2016a, EcOz 2023) indicate they are widespread and abundant (Figure 4-6). The monsoon forest, mangroves, planted woodland and gardens provide suitable foraging and shelter.

Figure 4-6. Photograph of a Northern Brushtail Possum recorded during the recent fauna surveys within the reserve (EcOz 2023)

Atlas Moth

The Atlas Moth *(Attacus wardi*) is listed as Vulnerable under the *TPWC Act.* The Atlas Moth is a large, nocturnal, rust brown moth with double banding and irregular white spots on each wing, with a wingspan of about 17 cm (Figure 4-7). The Atlas Moth is a monsoon forest endemic, restricted to high rainfall coastal areas of north-western Australia. The species relies on large patches of coastal monsoon forest, requiring specific

host plants (e.g. *Croton habrophyllus, Litsea glutinosa*, and *Pittosporum moluccanum*) for breeding and caterpillar development (Braby & Nielsen 2011). According to observational studies, the moths deposit their eggs on the underside of mature leaves in the upper crown of these trees (Lane et al. 2010).

There are very few recent records of this species in the Top End. A 2019 observation was made within 10 kilometres of the reserve (DEPWS 2023), and more recently, a new record from suburban Rapid Creek in January 2024 (Louise Harrison, Rapid Creek resident, pers. comm). The decline of the Atlas Moth in the Darwin region is likely associated with the widespread use of insecticides during World War II, habitat loss caused by Cyclone Tracey and urbanisation around coastal monsoon forest at East Point and Lee Point (DEPWS 2021). In addition, studies indicate that a large number of wild eggs were found to be parasitised by a minute species of wasp (*Agiommatus sp*.) (Lane et al. 2010). Other threats include predation of adult moths by the Southern Boobook Owl (*Ninox boobook*) and larval predation by Green Tree Ants (*Oecophylla smaragdina*) (Lane et al. 2010).

In 2021, a reintroduction program for the East Point Reserve was commissioned by the City of Darwin. The program was conducted by Dr Richard Weir and Geoff Martin, and involved conducting surveys, a breeding program and staged release (Weir and Martin 2023). The aim of the program was to establish a self-sustaining viable population within the boundaries of the City of Darwin. Ten viable cocoons were translocated to East Point Reserve in early March 2023 and attached to a suitable host tree. In late March 2023, monitoring confirmed all ten had emerged, however, follow-up surveys failed to locate the moths. Throughout March and April 2023, a further 14 pupae held in captive breeding facilities were allowed to emerge and adults were then released at East Point Reserve.

Figure 4-7. Photograph of an Atlas Moth (photograph by Geoff Martin)

Migratory shorebirds

Australia is a signatory to three bilateral migratory bird agreements with Japan, China, and the Republic of Korea. These agreements provide a basis for cooperation on activities for the conservation of migratory birds that move between each country. Species listed on the annexes to these agreements are a Matter of National Environmental Significance under the *EPBC Act* as listed migratory species.

Migratory shorebirds spend the summer in Australia and use the East Asian-Australasian Flyway (EAAF) to travel to breeding grounds in the northern hemisphere summer. Once in Australia, shorebirds will seek out high-quality food on the intertidal zone of coastlines for the duration of the Australian summer (Lilleyman 2017).

East Point provides an ideal site for migratory shorebirds with the combination of intertidal mudflats for feeding, rocky shoreline for roosting during regular high tides, and rocky cliffs for roosting during king tides.

At East Point, large aggregations start to occur on rocky shorelines in the north and north-east of the reserve around August. Shorebirds start departing on their northward migration in February and March (Lilleyman 2017). East Point and other areas across the northern coastline are critical final staging sites for most species prior to their northern hemisphere migration. The decline in global migratory shorebird populations is attributable to various factors, including habitat loss and degradation within their breeding, stopover, and non-breeding habitats.

BirdLife Australia shorebird records show that at least 21 species of migratory shorebirds have been recorded at East Point Reserve (Figure 4-8) – some of which are listed as threatened under the *EPBC Act* and/or *NT TPWC Act*. Four threatened and two non-threatened migratory shorebird species have been recorded in nationally significant numbers within East Point Reserve:

- Great Knot (*Calidris tenuirostris*) – listed as Vulnerable under the *EPBC Act* and Critically Endangered under the *TPWC Act*.
- Greater Sand Plover (*Charadrius leschenaultii*) – listed as Vulnerable under the *EPBC Act* and *TPWC Act*.
- Red Knot, *Calidris canutus*, listed as Vulnerable under the *EPBC Act* and Endangered under the *TPWC Act*.
- Ruddy Turnstone (*Arenaria interpres)* listed as Vulnerable under the *EPBC Act.*
- Grey-tailed Tattler (Tringa brevipes).
- Whimbrel (*Numenius phaeopus*).

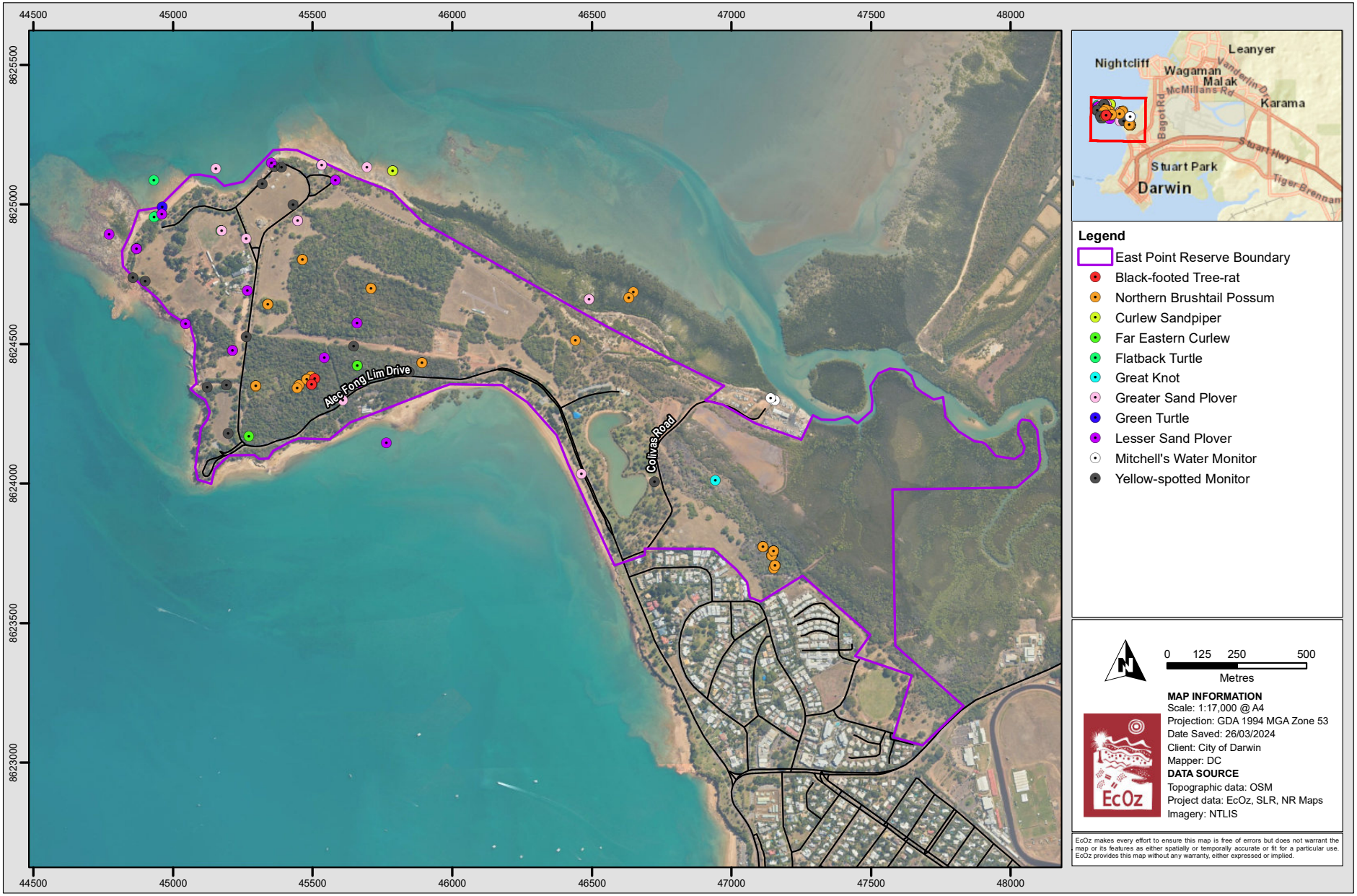


Figure 4-8. Mapped records of significant threatened and migratory species within East Point Reserve

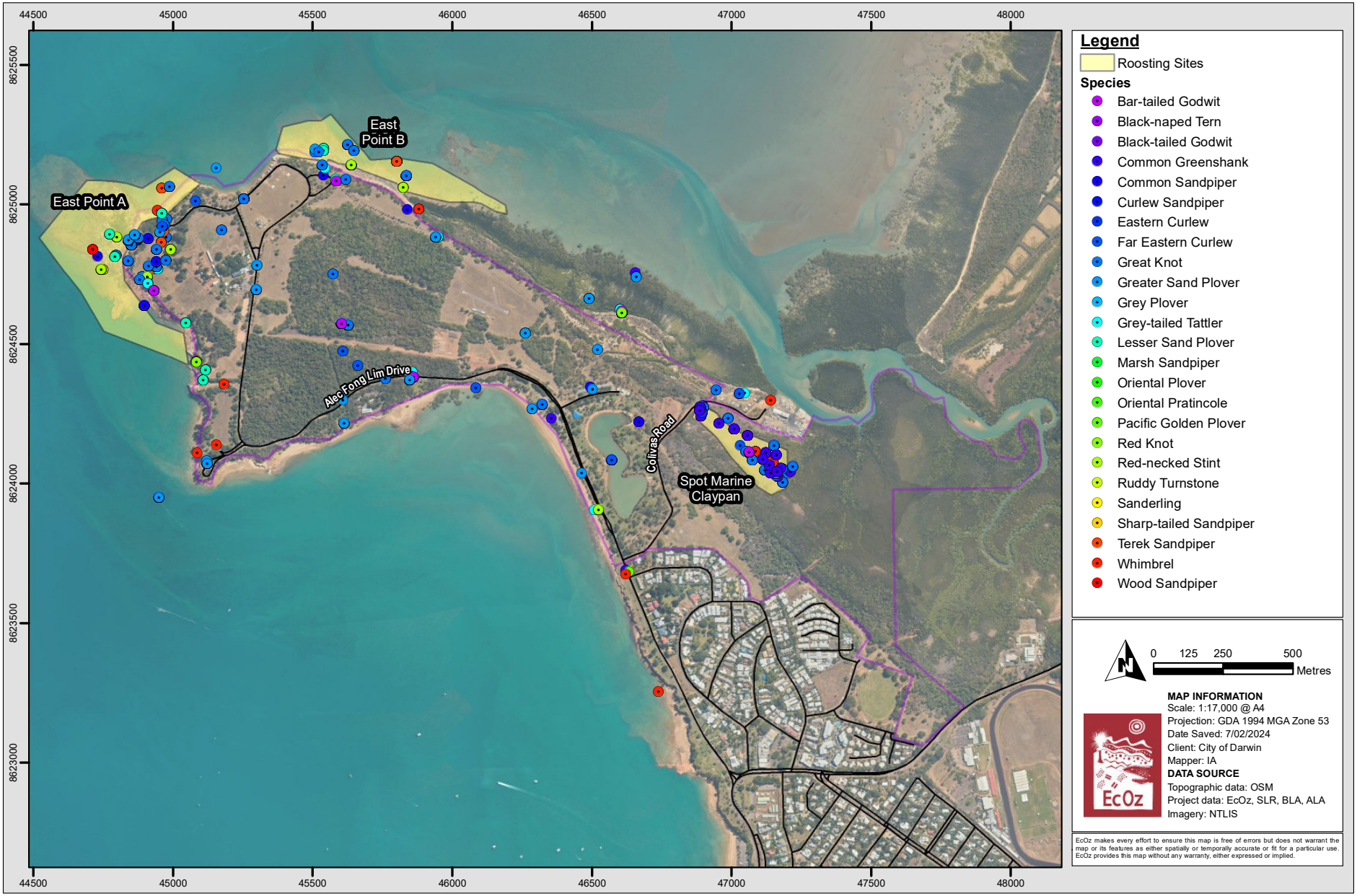


Figure 4-9. Shorebird survey areas and habitat

4.4 Key non-threatened species

Reptiles

In addition to the threatened fauna species listed above, there are many iconic reptile species that are known to occur within East Point Reserve. These species include are Frilled Lizard (*Chlamydosaurus kingii*), Northern Brown Snake (*Pseudonaja nuchalis*), Darwin Carpet Python (*Morelia spilota variegata*), Water Python *(Liasis fuscus*), Olive Python (*Liasis olivaceus*), Children's Python (*Antaresia children*), Spotted Tree Monitor (*Varanus scalaris*), Common Tree Snake (*Dendrelaphis punctulatus*), Brown Tree Snake (*Boiga irregularis*), and Olive Whipsnake (*Demansia olivacea*).

In particular, a population of Frilled Lizards at East Point Reserve is significant due to their decline across parts of the Darwin region and their iconic status in the Top End. Threats to the species includes late dry season fires (O'Shea et al. 2017), as well as predation by cats (Brook et al. 2004). The species vulnerability to population impacts from Cane Toad consumption is unclear.

Figure 4-10. Photograph of Frilled Lizard (*Chlamydosaurus kingii*) –taken by Ruth Marr

Agile Wallabies

East Point Reserve is home to a resident population of Agile Wallabies (*Macropus agilis*). The wallabies feed within the open grassed areas – particularly at dusk and dawn – and shelter within the monsoon forest.

During the 1970s and early 1980s, the wallaby population in the reserve was very large between 1,500 and 2,000 individuals (Stirrat 2000). The increase was attributed to the installation of year-round watering points and drip irrigation across. Stirrat (2000) noted that at its peak there were adverse impacts on the productivity and diversity of the monsoon forest, overgrazing in grassed areas, diminished amenity, and numerous vehicle collisions. By the late 1990s, the population had undergone a decline, estimated at approximately 400 individuals (Stirrat 2000).

Ongoing Wallaby surveys by City of Darwin staff have been undertaken by City of Darwin staff since 2014, with a maximum count of 52 joeys and 232 adults in September 2016, and an average of over 120 individuals overall (Figure 4-11). Current methods for monitoring wallabies by surveyors on foot can be highly variable depending on the time of year, weather conditions, time of day etc. Council should consider increasing the

accuracy of wallaby counts through the use of thermal imagery drones. This will provide a greatly enhanced accuracy in wallaby numbers within the reserve.

The Council still provide supplementary water for wallabies with six watering troughs that are kept filled throughout the dry season (Figure 4-12). The design of watering points was modified in 2015 to minimise Cane Toad access to water, however due to water spills and leaks still provide dry season refuge for Cane Toads (Lippiatt 2015, EcOz 2022).

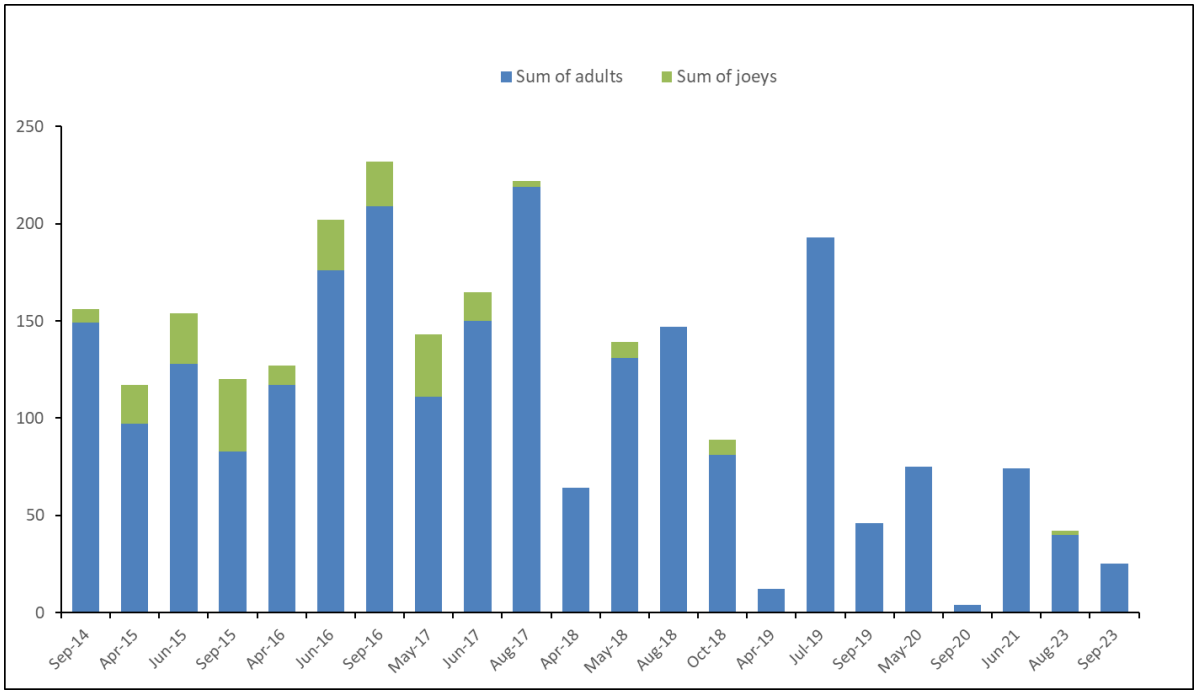


Figure 4-11. Graph illustrating wallaby count data 2014 – 2023

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Figure 4-12. Wallaby Watering Points

Dingo

The Dingo (*Canis familiaris (dingo*)) (Figure 4-13) is a protected native species found throughout mainland Australia in a variety of habitats (Smith 2015). This species plays a critical role as an apex predator and feeds on a wide variety of mammals, birds, and reptiles.

East Point Reserve supports a small population of Dingoes that are likely to be playing an important role in reducing the population of Agile Wallabies and maintaining a healthy, functioning ecosystem. Dingoes may also influence the presence of feral and domestic cats within the reserve, although their role in this is still under research – while some studies suggest dingoes have a top-down influence on feral cats and may suppress feral cat populations (Brook et al. 2012), there is little evidence that Dingoes limit the distribution or constrain the habitat use of Feral Cats in northern Australia (Allen et al. 2015, Stobo-Wilson et al. 2019). Dingoes are considered likely to opportunistically prey upon Feral Cats rather than actively hunt them (Schroeder at al. 2015).

Maintaining a small sustainable population of this important native predator should be part of the overall biodiversity management within the reserve. The presence of Dingoes may provide benefits in maintaining low wallaby numbers and potentially supressing or altering cat activity. Interpretive signage and education around appropriate human behaviours to keep both people and dingoes safe is the key management action that must be implemented throughout the reserve.

Figure 4-13. Photograph of Dingo (*Canis familiaris* (d*ingo*)) (taken by Ruth Marr)

5 THREATS

5.1 Weeds

For the purposes of this plan, a weed is defined as:

- A Weed of National significance (WoNS), or
- A declared weed under the Northern Territory *Weeds Management Act* (WM Act), or
- An environmental weed (weeds that are not declared under the *WM Act* but represent a threat to biodiversity values.

Landowners and managers are responsible for the control and management of WoNS and declared weeds. There is a legal obligation to manage weeds declared under the *WM Act*. The Act requires declared weed species to be eradicated (Class A), controlled (Class B) or not introduced into the NT (Class C). Under the *WM Act* It is the requirement and responsibility of the owner and occupier of land to adhere to:

- Take all reasonable measures to prevent the land being infested with a declared weed.
- Take all reasonable measures to prevent a declared weed or potential weed on the land spreading to other land.
- Within 14 days after first becoming aware of a declared weed that has not previously been, or known to have been, present on the land, notify the Weed Management Branch.

5.1.1 Current condition

Weed surveys inform management and assess success of control. Previous weed surveys were undertaken by EcOz in 2013, 2014, 2017 and 2021, with varied survey effort and species prioritisation. The most recent survey was conducted in 2021 and recorded 22 introduced species (Table 5-1 Table 5-1. and Figure 5-1). Eight of these are declared weeds, of which two are WoNS species, one Class A (i.e. to be eradicated), and five are Class B/C species (i.e. growth and spread to be controlled) (4).

WoNS species are the priority for control, along with environmental weed species that may cause major impacts within the reserve – including Coffee Bush, Poinciana and Mission Grass. Coffee Bush is a significant environmental weed that can impact on remnant vegetation patches and poses a risk to revegetation areas. Similarly, Annual Mission Grass can outcompete native understorey species and increases fire risk within the reserve. Note, however, that Poinciana is valued for its aesthetic value and hence the species is controlled on the northern side of Alec Fong Lim Drive, but is allowed to remain on the southern side of the road.

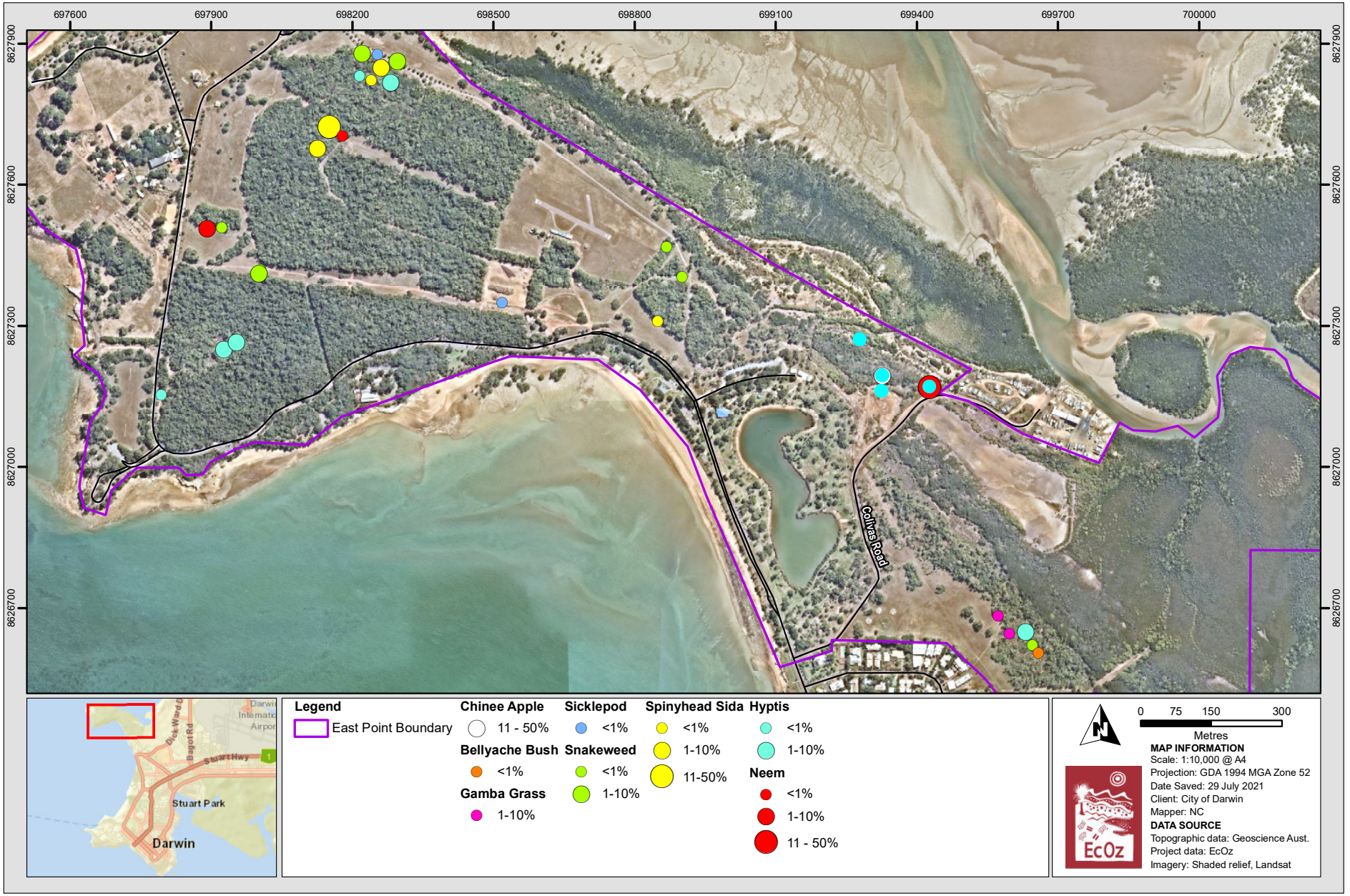
Monitoring (and record keeping) is important for identifying new or re-establishing weed infestations at an early stage, and determining the effectiveness of control methods, enabling improvements to future weed management.

Weed control techniques are included in Appendix C.

Table 5-1. Weeds recorded in the reserve in 2021 (EcOz 2021)

Name		Classification				
Common	**Scientific**	**WoNS**	**Class A**	**Class B**	**Class C**	**Env Weed**
Bellyache Bush	*Jatropha gossypiifolia*	✓	✓			
Chinese Apple	*Ziziphus mauritiana*		✓			
Gamba Grass	*Andropogon gayanus*	✓		✓		
Hyptis	*Mesosphaerum suaveolens*			✓	✓	
Neem	*Azadirachta indica*			✓	✓	

Sicklepod	*Senna obtusifolia*			✓	✓	
Snakeweed	*Stachytarpheta jamaicensis*			✓	✓	
Spinyhead Sida	*Sida acuta*			✓	✓	
Annual Mission Grass	*Cenchrus pedicellatus*					✓
-	*Calopogonium mucunoides*					✓
Cheesewood	*Alstonia scholars*					✓
Cinderella Weed	*Synedrella nodiflora*					✓
Coffee Bush	*Leucaena leucocephala*					✓
Curry Tree	*Murraya koenigii*					✓
Gmelina	*Gmelina arborea*					✓
Ivy Gourd	*Coccinia grandis*					✓
King Of Bitters	*Andrographis paniculata*					✓
Mother-In-Law Tongue	*Dracaena trifasciata*					✓
Poinciana	*Delonix regia*					✓
Purple Top Chloris	*Chloris inflata*					✓
Red Natal Grass	*Melinis repens*					✓
Stinking Passionfruit	*Passiflora foetida*					✓



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ21087 - East Point vegetation monitoring survey\01 Project Files\Report maps\Figure 2 - Map of all declared weeds recorded within the reserve 2021.mxd

Figure 5-1. Map of weeds recorded within the reserve

5.2 Pest animals

According to the NT Fauna Atlas (DEPWS 2023), six introduced fauna species have been recorded within East Point Reserve and the immediate surrounds. Of these pest animals, two pose a significant threat to the biodiversity values of the reserve. Cane Toads (*Rhinella marina*) are abundant within the reserve and pose a major threat to a number of fauna species. Feral and domestic cats (*Felis catus*) are considered likely to be impacting on fauna values within East Point, despite not being detected within the most recent fauna surveys in late 2023 (EcOz 2023). Both Cane Toads and Feral Cats are listed as a Key Threatening Process under the *EPBC Act*.

The reserve supports one native species (Six-toothed Rainbow Skink *Carlia sexdentata*) that is outside its natural range. This species was introduced to the Darwin area and is the subject of investigation into the current impacts in association with competition, predation and displacement of other locally indigenous species (i.e. particularly small skinks occupying the same niche).

Cane Toads

Cane Toads (Figure 5-2) are native to South and Central America (Cogger 2014) and were introduced to Queensland in 1935 (CSIRO 2019, DSEWPC 2011). Since their introduction, their range has expanded rapidly along Australia's east coast and northern areas, and they are estimated to occupy 2 million square kilometres (Letnic et al. 2019). . They are now widespread across the Northern Territory, reaching Darwin in 2005; and crossing through to Western Australia in 2009 (DSEWPC 2011). Cane Toads are listed as a 'key threatening process' under the *EPBC Act*.

Cane Toads use potent steroid-derived toxins (bufotoxins) as chemical defences and have varying levels of toxicity at all stages of their lifecycle (DESWPC 2011, Shine 2010). For these vulnerable native predators, this has resulted in the direct mortality of individual animals but also some devastating impacts at the population level for numerous carnivorous species – including the Yellow-spotted Monitor (Doody et al. 2009); Mertens' Water Monitor (*Varanus mertensi)* (Doody et al. 2009); Northern Blue-tongued Skinks (Price-Rees et al. 2010); Northern Quolls (*Dasyurus hallucatus*) (Webb et al. 2015); and many snakes (Jolly et al. 2015; Phillips et al. 2003).

Fortunately, some native predators that were heavily impacted when toads first arrived are showing signs of a slow recovery (i.e. through rapid behavioural or morphological adaptations), providing hope for longer term recovery (Webb et al. 2015, Jolly et al. 2016).

Cane Toads are present throughout East Point Reserve and are considered to be a primary cause of population decline for some species – including Yellow-Spotted Monitor, Mitchell's Water Monitor, Northern Blue-tongued Skinks and Frilled Lizards.

A five-year Cane Toad Management Plan has been prepared for East Point Reserve (EcOz 2022) using baseline data collected over the 2021/2022 wet season, historic data from informal Cane Toad 'busts' and habitat assessments throughout the reserve. Management of Cane Toads within the reserve should focus on removing toads and minimising available resources including:

- Water resources [watering points, troughs, irrigation of lawn and revegetation areas and irrigation infrastructure (leaking valve boxes, pipes), water features, taps, horse wash down bay, pooling water in drains etc.]
- Shelter resources (e.g., under sheds / stables and buildings, shipping containers, within drains and moist shaded environments provided by dense garden beds).
- Foraging resources – the reserve provided plentiful foraging resources for toads with illuminated buildings attracting insects, abundance of invertebrates attracted to horse manure at the Fannie Bay Equestrian Club, potential scraps from bins.

A summary of the key management actions for Cane Toads have been included below that aligns with the key objectives of the Cane Toad management plan.

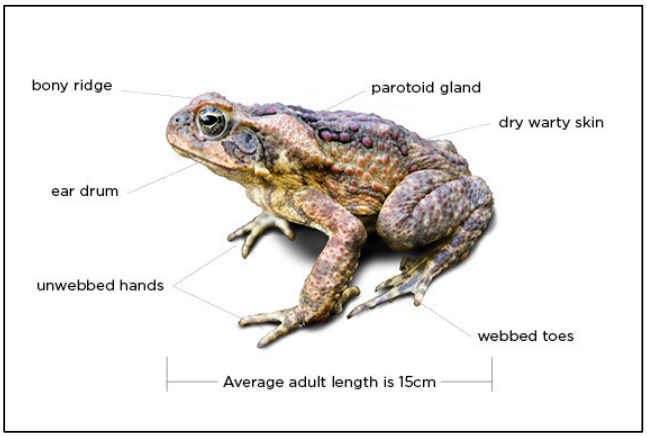


Figure 5-2. Cane Toad identification diagram (OEH 2021)

Feral cats

Feral Cats occur throughout the Top End in a wide variety of habitats. Since European settlement, cats have been implicated in the extinction of many native fauna species and are considered to be the primary cause of extinction for 33 mammal species (Woinarski et al. 2015) and a contributing factor to one of 10 invertebrate extinctions, all three reptile extinctions, two of nine bird extinctions (Woinarski et al. 2019a). The ongoing decline of small mammals across northern Australia is also believed to be due, in a major part, to predation by the feral cat (Gibson et al. 1994; Christensen & Burrows 1995; Fisher et al. 2013; Frank et al. 2014; Woinarski et al. 2014). Species within the critical weight range (e.g. species with body weight between 35 and 5500g (Burbidge and McKenzie 1989) are at highest risk.

Predation by Feral Cats is listed as a key threatening process under the EPBC Act. A draft Threat Abatement Plan (TAP) was released in September 2023 that identifies research, and management requirements (DCCEEW 2023a). Feral Cats were also declared as a National Pest in 2015. The declaration states that "*where effective and humane techniques to control feral cats are available, that do not pose an unacceptable threat to the survivability and ecological function of non-target protected species in the treatment area, they should be pursued in coordination with other pest control activities to benefit threatened species*".

Cats were recorded within East Point Reserve during the 2013 Biodiversity assessment (EcOz 2013a) but not during the 2016 (DLRM 2016) or 2023 fauna surveys (EcOz 2023). Lack of detection during recent surveys does not mean they are not present, cats are secretive and cryptic, and surveys did not target cats.

Six-toothed Rainbow Skink

The Six-toothed Rainbow Skink occurs throughout Cape York Peninsula, north-east Arnhem Land, and Groote Eylandt. An introduced population is present within Darwin City and the Howard Springs area, where it is now abundant particularly in urban gardens (Jolly et al. 2023). The species is much larger than indigenous *Carlia* species that occur around Darwin and has the potential to outcompete and predate on native skinks that occupy the same niche. This species has become the dominant skink species in many urban areas in Darwin (Jordan Mulder, Monash University, pers. comm.), and was recorded during the recent fauna surveys at East Point Reserve (EcOz 2023). Other records of this species are located within Fannie Bay, The Gardens and Rapid Creek (ALA 2023), all within a 5 km from the reserve. Research on the potential negative impacts of this species is proposed and due to start in 2025. The City of Darwin can facilitate this research through access approvals to East Point and other council managed sites where this species occurs. On-ground staff and the community should be encouraged to record and submit sightings of this species, with photographic evidence to fauna databases (i.e. through iNaturalist or the NT Fauna Atlas).

5.3 Domestic animals

Domestic animals have the potential to impact directly and indirectly on the biodiversity values of East Point Reserve. A large number of domestic dogs and cats currently reside within the municipality with a total of 7,304 cats and dogs registered as pets (City of Darwin 2023).

As per the City of Darwin Dog and Cat Management Strategy 2018 – 2022, it is a mandatory requirement for dogs and cats to be registered with the Council, micro-chipped, contained within the property, and adequately controlled when outside the premises. Under the City of Darwin's by-laws, cats must also be kept inside at night.

Domestic dogs and cats are not permitted within the main area of East Point Reserve, but are allowed to be walked along Colivas Road. Dogs can pose a threat to native wildlife, usually through indirect processes like disturbance to flocks of birds. Dogs being exercised irresponsibly around the permitter of the reserve – and particularly near the saltpan roosting and foraging areas (i.e. Spot On) and the Breezeway outside the fenced areas of the reserve – may cause individuals or flocks of foraging or roosting birds to take flight. They may also flush birds from nests during incubation and breeding. Dogs may predate on ground-dwelling frogs, reptiles, birds and mammals.

The detailed discussion of the likely significant impacts of Feral Cats on biodiversity values above also applies to free-roaming pet cats. While the specific impacts of domestic cats on native wildlife within the City of Darwin is unknown, cats selectively prey upon small mammals, birds and reptiles (DCCEEW 2023). Cats also act as a reservoir for disease such as *Toxoplasma gondii* (protozoan species) and *Spirometra erinacei* (tapeworm) that may impact humans, other domestic animals and native wildlife (DCCEW 2023). Domestic cats that are not properly managed may add to the feral cat population.

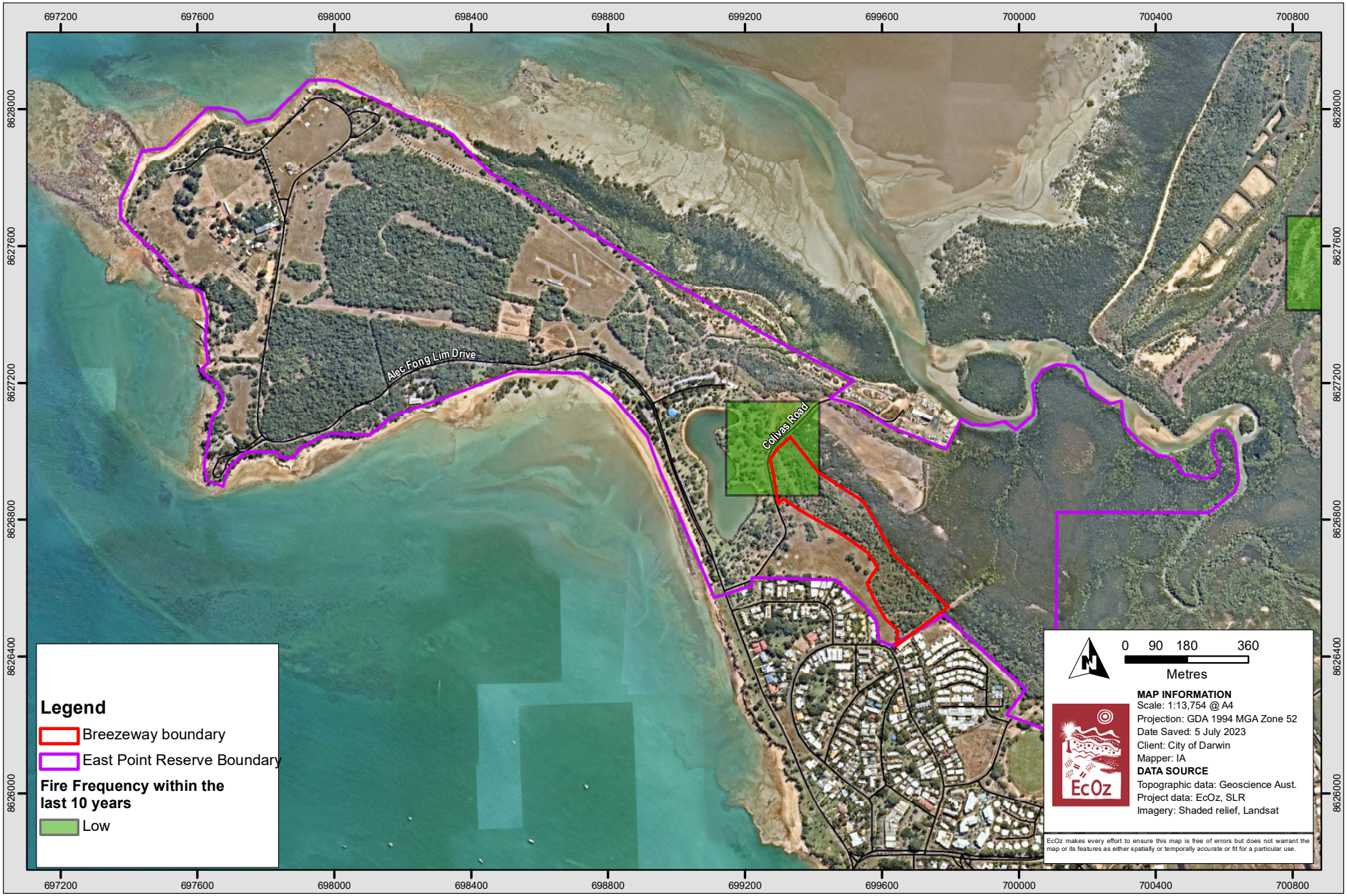
5.4 Fire

Regular fires have always been a natural part of the environment in the Top End, with the northern savannas some of the most prone landscapes (Russell-Smith & Whitehead 2015). Fires have different origins, including natural (i.e. lightning strike), illegal burns lit by arsonists and planned burns for fuel reduction, ecological and cultural purposes. Frequent fires of any nature can result in fewer flora species and reduced structural complexity (McKay 2017), both of which can also significantly diminish the habitat quality for fauna, facilitate weed invasion and damage revegetation efforts.

An assessment of fire management requirements was undertaken at East Point using field and desktop data. Field based observations of management requirements are shown in Figure 5-4 and outlined in Appendix D. Regional fire history and fire scar mapping for East Point Reserve and surrounds was obtained through the Northern Australia and Rangelands Fire Information (NAFI) website. This mapping in Figure 5-3 shows that fire has only occurred once within the 'Breezeway' section of the reserve in the past 10 years. This fire occurred in 2022 and was a low intensity fire i.e. cool burn (Figure 5-3– note NAFI does not map small scale fires, so the extent in the map may not reflect the on-ground fire scar). No late season fires (from August onwards) have been recorded using NAFI.

Fire management is a legislative requirement for Council and surrounding stakeholders (e.g. NTG – Crown Lands) under the NT Bushfire Management Act 2016. Fire management activities within the reserve are required to protect the ecological values and reduce the risk to surrounding residential areas. Council uses a range of techniques to manage fire risk, including fire breaks and reducing biomass of invasive and native grasses (e.g. slashing/mowing and spraying) to protect habitat values and surrounding residential development. Any future planned burns must minimise impacts to biodiversity values and be undertaken as mosaic, cool, early dry or wet season burns, with avoidance of all monsoon and mangrove areas. This will minimise the impacts on native flora and fauna species, and allow regeneration to establish, but also reduce risk for surrounding residential development. Late season fire (from August onwards) must be avoided because they are typically hotter than those occurring earlier in the dry season, particularly where high threat grasses such as Gamba Grass and Annual or Perennial Mission Grass – which occur within the Breezeway area. Late season fires are often anthropogenic in origin (i.e. not caused by lightning), and their effect on native flora and

fauna is usually more detrimental. These hotter, more intense fires affect not just the ground and mid strata, which have evolved to adapt to fire, but also the more fire-sensitive canopy stratum. Fire management activities such as firebreak maintenance and installation are required within the reserve as outlined in Table 6-8.



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ23047 - East Point Biodiversity Management Plan Review\1. Project Files\2. Report Maps\Map of Fire history within East Point.mxd

Figure 5-3. Map of fire history within East Point Reserve

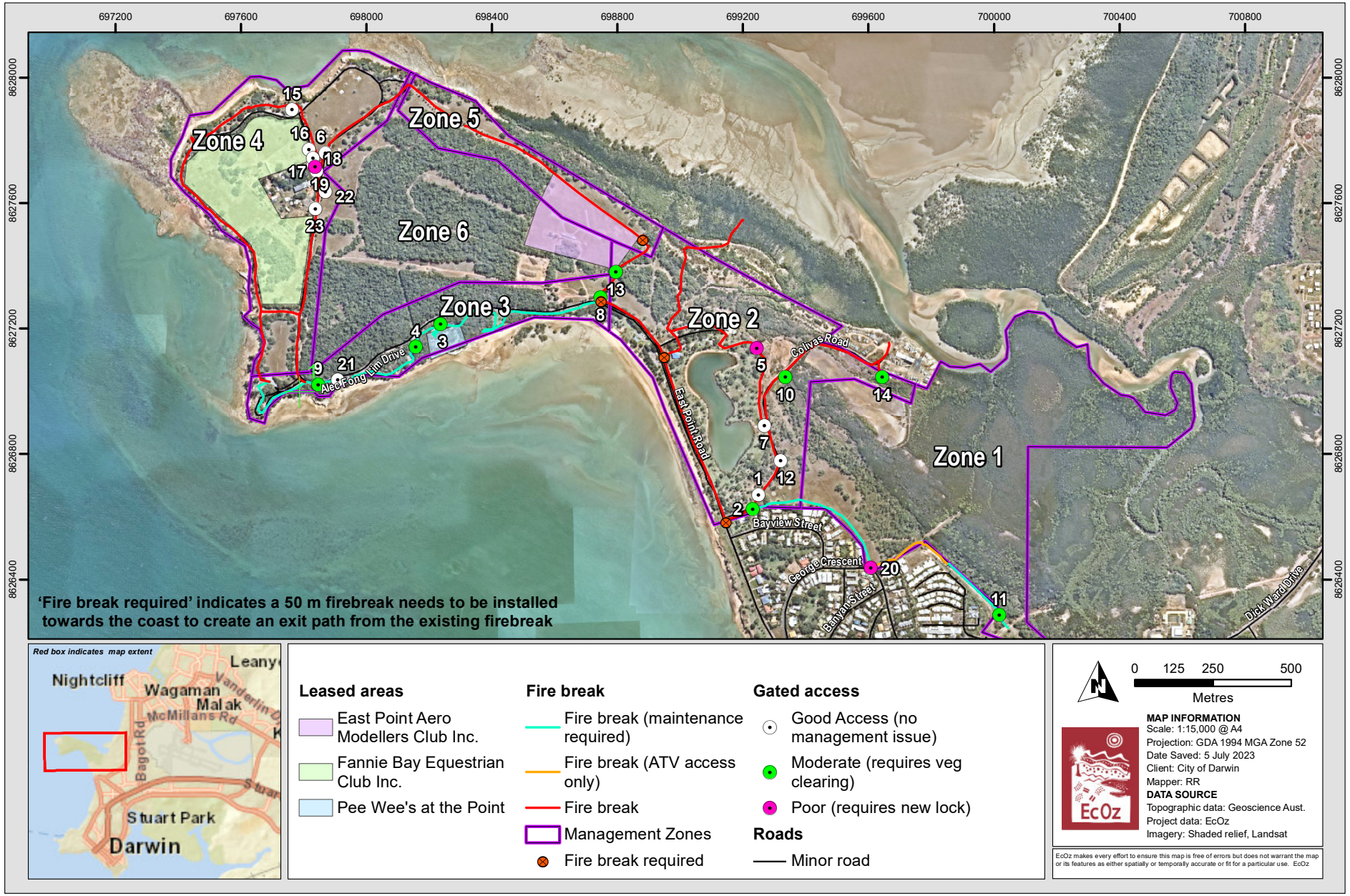


Figure 5-4. Map of fire management requirements within East Point Reserve

5.5 Artificial water sources

East Point Reserve provides numerous artificial water sources (e.g. watering points, irrigation within revegetation areas, gardens and lawn, water features and other areas of pooling water from leaking infrastructure) that provide a key resource for native species, but also contribute to impacts on biodiversity values through the maintenance of Cane Toad populations. Given the lack of natural sources of fresh water within the reserve during the dry season, it is evident that these water sources are providing critical habitat for toad populations and enabling their survival over the dry season. Minimising the use of water on-site – and eliminating where possible – and implementing a regular maintenance program to identify and fix leaks will reduce habitat suitability and potentially decrease their survivorship within the reserve. Key water sources are discussed further below.

5.5.1 Lake Alexander

Lake Alexander is the largest body of water within the reserve and is filled with saltwater pumped from Darwin Harbour. The lake provides habitat for Collared Sparrowhawk (*Accipiter cirrocephalus*), Striated Heron (*Butorides striata*), Little Egret (*Egretta garzetta*) and Straw-Necked Ibis (*Threskiornis spinicollis*). Due to the salt content, the lake does not provide suitable breeding habitat for native frog species or the invasive Cane Toad. However, freshwater is used for lawn irrigation and other water infrastructure around the lake. This use should be monitored and minimised where possible to ensure it does not provide a dry season refuge for Cane Toads.

5.5.2 Water points and troughs

Artificial watering points are installed within the reserve to provide the Agile Wallaby population and other fauna species with a permanent water source throughout the year. The original design of these troughs enabled Cane Toads to utilise them due to their low height but since 2015, six of the watering points were modified and raised with the aim to exclude Cane Toads (see Figure 5-5) (Lippiatt 2015, SLR 2018). However, during a 2021/2022 assessment of the reserve (EcOz 2022), it was noted that one of the watering points did not exclude toads due to its low height (WP2 – see Figure 5-6) and many were leaking (e.g. WP4 – see Figure 5-7) due to malfunctioning floats (Anita Meadows, pers. comm.), creating ideal dry season refuges for Cane Toads. It is essential that persistent leaking watering points be decommissioned. Impacts to the float function has been attributed to their use by the larger python species (e.g. Darwin Carpet Python – see Figure 5-8) that wrap themselves around the float mechanism causing damage to the lever (Graeme Sawyer, pers. comm.). Preventing access to the float mechanism by pythons must be considered.

Regular monitoring of watering points is required to ensure that they do not leak onto the ground and attract Cane Toads. Surveys in 2021/2022 regularly observed Cane Toads sitting within the moist and muddy pools adjacent to these watering points, allowing them to rehydrate, absorbing water through their skin (see Figure 5-9). Reducing the occurrence of Cane Toads around these water resources is critical to reducing the impacts on key threatened and non-threatened species within the reserve. It is recommended that as part of the management of Cane Toads at East Point Reserve priority should be given to routine inspection and the maintenance of watering points to ensure leaks do not promote toad presence. Further closure of watering points can be considered if reduction in the Agile Wallaby population is required.

An additional five water troughs are also present within the Fannie Bay Equestrian Club. Water spillage around horse troughs is a consistent and difficult issue because horses will splash water around while drinking creating wet muddy conditions on the ground.

Figure 5-5. Photograph of wallaby watering point (WP1) modified and raised to exclude Cane Toads (1 June 2021)

Figure 5-6. Photograph of unmodified concrete wallaby watering point (WP2) that regularly overflows, creating adjacent muddy pools (18 June 2021)

Figure 5-7. Photograph of a water leak at WP4 with a female Cane Toad using the pooling water to rehydrate (18 January 2022).

Figure 5-8. Photograph of a Darwin Carpet Python observed within a wallaby watering point (taken by Anita Meadows, City of Darwin)

5.5.3 Irrigation

There are numerous areas within East Point Reserve that are irrigated during the dry season for various purposes and are known to provide a critical dry season refuge for Cane Toads (Figure 5-9). Where watering is undertaken, the current regime is to water nightly during the dry season for 20 mins (Anita Meadows, pers. comm.). While lawn irrigation within the reserve is on-going to maintain amenity in key areas, revegetation plots are only supported by irrigation through one to two dry seasons after planting (Anita Meadows, pers. comm.). As such from 2024, irrigation of revegetation areas should no longer be required, and no further large-scale revegetation plots are recommended.

The current areas of irrigation within the reserve are (Anita Meadows, pers. Comm.):

- Lawns around key recreation sites including Lake Alexander, Singh and Dudley Park.
- Lawn opposite the Fannie Bay Equestrian Club that is irrigated for wallabies.
- Areas of lawn within the Military Museum, Fannie Bay Equestrian Club and Pee Wees Restaurant.
- Plants within the nursery / Council compound.
- Individual trees planted along roads and pathways within the reserve.

Irrigation sprinklers, pipes and irrigation boxes are also prone to leaking and must be actively monitored to ensure they do not support Cane Toads. During the assessments in 2021/2022, Cane Toads were found sitting adjacent to leaking pipes, or within the planting depressions in pools of water (Figure 5-9 and Figure 5-10). Irrigation valve boxes must be maintained and, where possible, removed because they were found to provide key shelter and moisture resources for Cane Toads[2], with some leaking during previous monitoring in 2021/2022. Management should prioritise the maintenance of these boxes to minimise and/or eliminate water sources that can support toads through dry periods of the year. If valve boxes are not removed, modifications are strongly recommended to exclude toads and eliminate this dry season refuge, by either burying the boxes or elevating above ground level to stop toads entering through the pre-cut hole in the valve box cover (Figure 5-11 and Figure 5-12). Alternatively, if no changes are made, City of Darwin staff should use these boxes as dry season collection sites for on-going toad removal.

5.5.4 Other water sources

Other sources of water available within the reserve include bubblers, taps, water features and drains (e.g. BBQ areas around Lake Alexander the Equestrian Club and the Military Museum). Cane Toads are known to utilise water features and drains within the Military Museum. Recent modifications have been made to block a single drain leading to the Cordite room and prevent Cane Toad entry (Norman Cramp, Military Museum Manager, pers. comm.); however, further investigation is required to map out and block all drain entrances.

[2] Five toads were found sheltering within one of these valve boxes in the central revegetation plot in 2021 and it is understood that City of Darwin staff are regularly observing Cane Toads in raised valve boxes and occasionally within buried boxes (Anita Meadows, pers. comm.).

Figure 5-9. Photograph of Cane Toads rehydrating from a leaking irrigation sprinkler in 2021 (Graeme Sawyer, 23 September 2021).

Figure 5-10. Photograph of irrigation throughout a revegetation plot at East Point Reserve (Ruth Marr, 2021)

Figure 5-11. Photograph of five Cane Toads sheltering within a raised valve box located within revegetation area west of the Aeromodellers Club (18 June 2021)

Figure 5-12. Photograph of raised valve box showing design allowing Cane Toads to enter (18 June 2021)

5.6 Climate change

Climate change is considered an overarching threat to the biodiversity values in the reserve. The implications of climate change are far-reaching and a detailed discussion of the various scenarios is beyond the scope of this management plan. However, key issues identified from literature point to the following scenarios potentially arising (Director of National Parks 2010, Hennessy et al 2004):

- Influx of salt water into terrestrial and freshwater habitats
- Increase in fire intensity and frequency
- Increase in flood frequency and intensity
- Greater occurrence of cyclone Category 3 or above, which could cause damage to the environment
- Increased variability in ecological processes including migration, breeding, availability of food resources and flowering and seed set
- Change in species composition, including potential for further weed and pest animal invasion.

While it is uncertain how climate change might impact on the habitat and ecological processes that underpin the values of the reserve, there is no doubt that changes will occur, either directly through increased temperatures or indirectly via things such as more frequent and/or intense fire. However, these issues cannot be influenced at this scale of management (i.e. within the reserve). As such, management needs to focus on mitigating the threatening processes which are manageable, maintaining and where possible enhancing connectivity, so that opportunities for adaptation to a changing environment are maximised.

5.7 Site security and land acquisition

Council should continue to pursue the acquisition of adjoining Crown Land (Lot 5984) to the north of the reserve that supports important mangroves and intertidal habitats. The acquisition of this land was put forward as a measure to protect and augment habitat specifically for migratory shorebirds (EcOz 2013) (Section 4.3) but would benefit a broad range of biodiversity values that reply upon the coastal and marine environments. Council should liaise with the NT Government Department of Infrastructure, Planning and Logistics and finalise the terms of agreement for a land transfer in accordance with the *Land Acquisition Act* and *Local Government Act*.

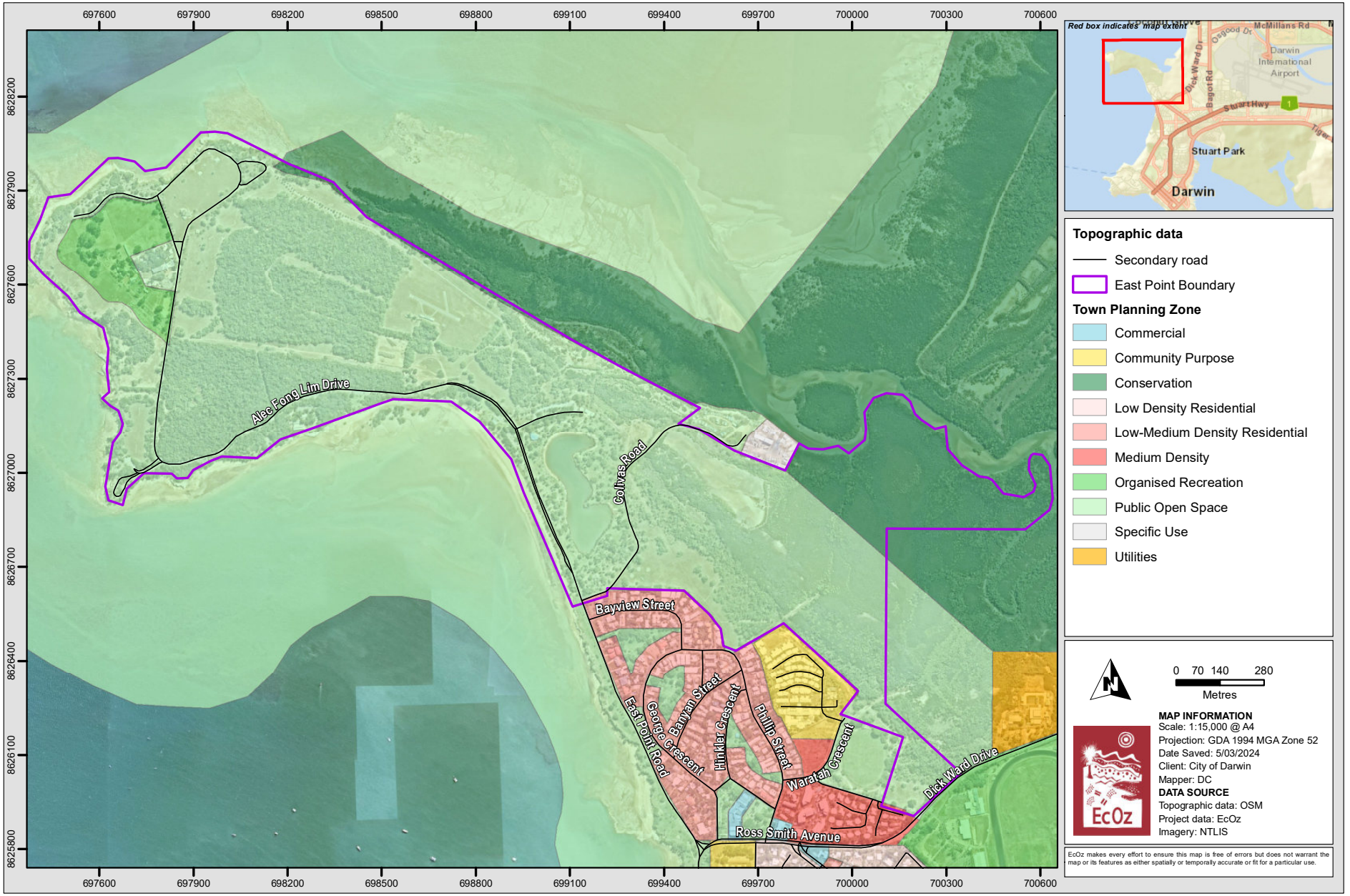
Planning zones within East Point Reserve are shown in Figure 5-13 and are categorised into the following:

- Public Open Space – most of the reserve is zoned as ‘public open space’ (173.7 ha) – this includes the terrestrial conservation and recreation areas.
- Organised Recreation – this includes the Fannie Bay Equestrian Club (9.4 ha).
- Conservation – includes approximately 20 ha along Ludmilla Creek within the reserve boundary.

Land adjacent to the reserve is zoned as:

- Conservation – this includes Crown Land north of the Reserve (and surrounding estuary/ coastal waters, including Ludmilla Creek.
- Low Medium Density and Medium Density Residential land in the adjacent suburb of Fannie Bay.
- Community Purpose – includes Pearl Retirement Village in Fannie Bay.
- Specific Use – includes Spot On Marine.

Darwin City Council should investigate how the planning scheme could be used to strengthen the site security of areas supporting high conservation values within the reserve through a Planning Scheme amendment.



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ23047 - East Point Biodiversity Management Plan Review\1. Project Files\2. Report Maps\Planning zones within and surrounding East Point.mxd

Figure 5-13. Planning zones East Point reserve

6 MANAGEMENT ACTIONS

This section presents management actions to protect values and address threatening processes within East Point Reserve. The management actions provided below aim to help achieve the overarching objectives / goals of the plan as provided in Section 1. The action plan is separated into nine key management elements:

- Significant fauna species
- Non-threatened fauna species
- Native vegetation / habitat
- Weed management
- Pest animals
- Domestic animal management
- Water management
- Fire
- Planning and land acquisition
- Education and research.

These elements are developed and presented in the following format:

Management Action	Timing	Responsibility	Priority

The actions are designed to be implemented over a five-year period. Some longer-term actions are also included where appropriate. The timing is categorised as follows: Short-term (ST) = implemented within the next 12 months; Medium-term (MT) = implemented between year two to three; and Long-term (LT) = implemented between year three and five. Objectives and performance indicators are identified for each management element. The performance indicators will guide the evaluation of success in achieving objectives. Monitoring program will determine if environmental/operational control measures are sufficient, and that objectives and legislative requirements are being met.

The implementation plan in Section 8 summarises the actions from each of these elements.

6.1 Significant fauna species

Table 6-1 outlines the management actions associated with the protection and enhancement of habitat and populations of threatened and significant fauna. The objectives of this management element are to:

- Protect population and habitat for threatened and significant fauna species.
- Control and/or eliminate threatening processes.
- Seek funding to implement key actions for threatened species monitoring and management.
- Raise awareness of fauna values through interpretive signage, implementation of community engagement events and a variety of media.

To evaluate the success of management, monitoring and evaluation must be undertaken throughout the life of the plan. Monitoring surveys for key threatened species should be standardised and repeatable to allow comparison across years, with all efforts documented. Adaptive responses can be undertaken as required. The following performance indicators are provided to guide the evaluation of management success.

- No local extinctions of threatened fauna species.
- Reduction in threatening processes.
- Improved condition and extent of habitat and resources for threatened species.

- Increased community and stakeholders involvement - actively working towards protecting habitat and populations of key threatened species.

Table 6-1. Significant fauna species – management actions

Management Action	Timing	Responsibility	Priority
General fauna monitoring			
• Undertake broad scope surveys every 10 years to look at long term trends.	NA	Council, Contractors.	High
• Undertake targeted surveys for threatened and non-threatened key species using standardised survey techniques.	MT, every 2-3 years	Council, Contractors, BiodiversityWatch.	Very High
Stakeholder engagement and community liaison			
• Encourage staff and the general public to submit records of threatened with corroborating photos to the NT Fauna Atlas or iNaturalist.	On-going	Council, Contractors, Community.	Very High
• Raise awareness of lesser-known threatened species within the potential to occur within and surrounding East Point – e.g. Mitchell's Water Monitor	On-going	Council	High
• Collaborate with key stakeholders and experts to share information on populations of threatened species and to support recovery effort	On-going	Council, contractors, BiodiversityWatch, research institutions, DEPWS	Very High
• Engage and encourage citizen science volunteers to support conservation efforts (e.g. Northern Blue-tongued Skink – by identifying individual skinks on camera images in association with a population monitoring program).	On-going	Council, community, research institutions.	High
• Seek opportunities with partners and stakeholders to fill knowledge gaps on threatened species (see Section 6.10)	On-going	Council, BiodiversityWatch, research institutions, DEPWS	High
Northern Blue-tongued Skink (recommended actions from DCCEEW 2023a) See also recommendations for grassy habitat management below.			
• Seek funding to implement a standardised, long-term, population monitoring program within, and surrounding, East Point to better understand the population and long-term sustainability.	LT	Council, research institutions	Very High
• Work with other research institutions to assess the success of management interventions (i.e. the Cane Toads management).	LT	Council, Contractors, BiodiversityWatch, research institutions	Very High
Mitchell's Water Monitor (recommended actions from DCCEEW 2023b)			
• Seek funding and work with partners / stakeholders to implement targeted surveys within, and surrounding, East Point – gather baseline data.	MT	Council, Contractors, BiodiversityWatch, research institutions, DEPWS	Very High
• Monitor the success of management interventions (i.e. Cane Toad management)	LT	Council, Contractors,	Very High
Northern Brushtail Possum			
• Monitor population through targeted fauna surveys – given apparent stability in this population – once in the life of the five-year management plan may be sufficient.	LT, Ongoing	Council, Contractors	High
• Raise awareness amongst community that despite possums generally being seen as abundant – and even considered as a pest in urban and peri-urban areas (i.e. within roofs) – their numbers are	Ongoing	Council	High

declining across their range due to a vast array of threatening processes			
• Monitor key threats to Northern Brushtail Possums within East Point (i.e. feral, stray and domestic cats).	Ongoing	Council, Contractors, surrounding stakeholders/land managers	Very High
Yellow-spotted Monitor			
• Seek funds to continue long-term monitoring for varanids (Yellow-spotted and Mitchell's Water Monitor) and other vulnerable reptile species within the reserve. Standardised survey methods must be developed, increasing area of assessment across the reserve.	MT, Ongoing	Council, Contractors, BiodiversityWatch, research institutions	Very High
• Seek funds or consider partnering with research institutions to radio-track individual Yellow-spotted Monitors (home range, time budgets, distances travelled, social behaviour, location of nesting / denning, dispersal routes, survival rates, diet and foraging behaviour and causes of mortality).	LT	Council, Contractors, research institutions	High
• Support research institutions and other stakeholders to undertake genetic assessment on Yellow-spotted Monitors within the reserve and across the broader Darwin region.	LT	Council, BiodiversityWatch, research institutions	High
General habitat protection, enhancement			
• Modify mowing regimes and retain multiple wide strips (each strip at least 30 m wide and 50 cm height) of unmown grassy habitat. This may increase invertebrate food resources for Yellow-spotted Monitors, Northern Blue-tongued Skinks, Frilled Lizards and other fauna species, provide shelter for fauna from environmental conditions and predators and may also discourage Cane Toads from moving through dense vegetation.	ST, Ongoing	Council, Contractors	Very High
• Implement actions within the East Point Cane Toad Management Plan (EcOz 2022) to reduce Cane Toad numbers and habitat suitability for this invasive species.	ST, Ongoing	Council	Critical
• Monitor impacts of Feral and domestic cats.	ST, Ongoing		Very High
Migratory shorebirds			
• Continue exclusion of domestic dogs within the reserve.	Ongoing	Council, Contractors, BiodiversityWatch, research institutions	Very High
• Enforce dogs on leash along Colivas Road and Spot on Marine to minimise disturbance to roosting shorebirds within the Spot On Marine saltpan and other beach access points.	ST, Ongoing	Council	Very High
• Promote shorebird education and awareness through community engagement and events in collaboration with Birdlife Top End. Twice annually – start and end of the migratory season.	Ongoing	Council, Birdlife Top End	Very High
• Install educational signs with species identification, ecology, threats and measures to support shorebird conservation at: 1) the northern roost site area (BBQ shelter north of museum), 2) the rocky roost on the western-facing point of the Reserve, and 3) the Spot On Marine saltpan and beach access points.	ST	Council, Birdlife Top End	High,
• Monitor and strengthen exclusion of access to Spot On Marine salt pans (i.e. barriers or fencing to ensure vehicles do not enter).	ST, Ongoing	Council	Very High
• Investigate the installation of a bird viewing platform (with appropriate consultation with Birdlife and other experts) that overlooks either the western rocky reef, or the rocks at Dudley Point.	LT	Council, Contractors, Birdlife Top End	High
• Consider excluding public access to shorebird roosting sites to ensure a minimisation of potential disturbance impacts.	ST	Council, Birdlife Top End	High

• Augment shorebird habitat at East Point through the acquisition of the eastern portion of Lot 5984 (see Section 6.9).	LT	Council, DIPL	High
Atlas Moth			
• Seek a detailed reintroduction / translocation plan that contains contemporary data, knowledge, the captive breeding program, and targets for release at various life stages, monitoring and adaptive management. In the absence of a recovery team, expert opinion must be sought from DEPWS, MAGNT and research institutions. Timelines and costing can be determined from a detailed plan. Council should use the plan as the basis for sourcing funding through external grant opportunities or funded internally if possible.	MT	Council, Contractors, research institutions, DEPWS	Very High
• Supplementary plant *Pittosporum moluccanum* and other larval food plants (*Croton habrophyllus* and *Litsea glutinosa*) within existing patches of monsoon forest.	ST	Council, Contractors, Friends of East Point Reserve	High
• Continue to monitor the success of the Atlas Moth reintroduction during the wet seasons by actively seeking eggs and larvae at East Point with ad hoc light trapping conducted toward the end of the wet season to determine the presence of adults in the breeding areas.	Ongoing		High

Short-term (ST) = implemented within the next 12 months; Medium-term (MT) = implemented between year two to three; and Long-term (LT) = implemented between year three and five.

6.2 Non-threatened key fauna species

Table 6-2 provides actions to protect and enhance habitat and monitor populations of non-threatened key fauna species. The objectives of this management element are to:

- Protect and enhance fauna values through controlling and/or eliminating threatening processes.
- Continue to periodically monitor general fauna values within the reserve.
- Raise awareness of fauna values through interpretive signage, implementation of community engagement events and through a variety of media.
- Continue to monitor Agile Wallabies and ensure that the population does not exceed carrying capacity or impact other key biodiversity values.

To evaluate the success of management, monitoring and evaluation must be undertaken throughout the life of the plan. Monitoring surveys must be standardised and repeatable to allow comparison across years, with all efforts documented. Adaptive responses are to be implemented as required. The following performance indicators are provided to guide the evaluation of management success.

- Increase in non-threatened fauna species vulnerable to Cane Toads.
- Reduction in threatening processes.
- Increase in community and stakeholders actively working towards protecting habitat and populations of key threatened species.

Table 6-2. Non-threatened key fauna species – management actions

Management Action	Timing	Responsibility	Priority
Non-threatened reptiles vulnerable to impacts from Cane Toad			
• Seek funds for targeted monitoring of key reptile species vulnerable to the impacts of Cane Toads (e.g. Frilled Lizards). Determine baseline population levels to inform management actions.	On-going	Council, Contractors, BiodiversityWatch, research institutions.	Very High
Agile Wallabies			
• Continue biannual surveys. Review data and analyse for rapid increases in population growth (increasing population counts over 6 months). Daytime surveys can be considered in cloudy conditions. Where very low numbers are detected (e.g. <~30 individuals), follow up surveys should be undertaken to confirm accuracy.	On-going – 6 monthly (one in wet and dry).	Council, Contractors, BiodiversityWatch, research institutions.	Very High
• Consider increasing the accuracy of wallaby counts through a change in methodology (e.g. use of thermal imagery drones).	On-going, 6 monthly	Council, Contractors,	Very High
• Monitor grassy areas for evidence of overgrazing by wallabies.	On-going, bi-monthly	Council, Contractors, BiodiversityWatch, research institutions.	Very High
• Determine Agile Wallaby carrying capacity of East Point Reserve – this will provide a threshold for adaptive management intervention.	MT	Council, contractors, DEPWS	Very High
• Regularly monitor and maintain of all wallaby watering points to ensure leaks do not occur and provide refuge for Cane Toads. Leaking troughs should be decommissioned. Further, decommissioning of troughs should occur if wallaby numbers exceed carrying capacity (TBD) of the reserve – identified through count data and impacts on vegetation / habitat values.	Monthly, On-going	Council, Contractors, BiodiversityWatch, research institutions.	Very High
• Irrigation of lawns should be minimised as this will support elevated wallaby numbers and provide refuge for Cane Toads. If irrigation is proposed to continue, implement periodic shutdowns with the aim to desiccate and stress Cane Toads, thus lowering their survivorship.	On-going	Council, Contractors, BiodiversityWatch, research institutions, community.	Very High
Dingoes			
• Install interpretive signage within the reserve (entrance and a major carparks / BBQ areas) providing information on this important native species, their biology/ecology, their role in ecosystem function and discourage human behaviour that puts both dingoes and humans in danger (e.g. feeding or approaching them).	ST	Council, Contractors, BiodiversityWatch, research institutions.	Very High
• Record and submit records of Dingoes to the NT Fauna Atlas. This information can be accessed Council, Contractors, BiodiversityWatch, research institutions, community.and used for comparison of numbers / habitat use between years.	On-going	Council, Contractors, BiodiversityWatch, research institutions, community.	Very High
• Ensure that food scraps do not spill from bins in the reserve that could attract dingoes.	On-going	Council, Contractors, BiodiversityWatch, research institutions, community.	Very High

Short-term (ST) = implemented within the next 12 months; Medium-term (MT) = implemented between year two to three; and Long-term (LT) = implemented between year three and five.

6.3 Native vegetation / habitat

Table 6-3 provides actions to protect and enhance native vegetation values and habitat within East Point Reserve. The objectives of this management element are to:

- Manage modified grassy habitats for key threatened fauna – balance with the needs of fire management and other fauna values (e.g. wallabies).
- Maintain the current extent of the monsoon forest vegetation and continue restoration through targeted augmentation of particular monsoon forest species (e.g. supplementary infill planting of Atlas Moth food plants).
- Investigate the vegetation and fauna habitat values of the 'breezeway' and the requirements associated with revegetation.

Management of threats (e.g. weeds) to native vegetation and fauna habitat is addressed separately within Section 6.4.

To evaluate the success of management, monitoring and evaluation must be undertaken throughout the life of the plan. All monitoring surveys for weeds and revegetation should be standardised and repeatable to allow comparison across years. Monitoring data should be collected, stored and documented for future review and to allow adaptive responses as required. The following performance indicators are provided to guide the evaluation of management success.

- Maintain extent and condition of native vegetation communities (e.g. monsoon forest, mangroves, coastal).
- Increase availability of food plants for Atlas Moths in preparation for further reintroductions.
- Improved condition and extent of grassy habitat and resources for threatened species through modified management regimes.
- Increased awareness of reserve users of the importance of grassy areas for key threatened fauna.

Table 6-3. Native vegetation / habitat management actions

Management Action	Timing	Responsibility	Priority
Monitoring Revegetation			
• Continue to monitor the health and condition of revegetation areas using established monitoring methods (EcOz 2017b, EcOz 2021).	MT, once during the life of five year plan	Council, Contractors	High
Monsoon forest			
• Undertake supplementary planting only within monsoon forest areas (i.e. food plants for Atlas Moth).	ST, ongoing as required	Council, Contractors	High
Modified grassy habitat			
• Monitor and manage grassy areas for threatened and key non-threatened fauna species - retain multiple wide strips (each strip at least 30 m wide and 50 cm height) of unmown grassy habitat.	Ongoing	Council, Contractors	Very High
• Monitor grassy areas for evidence of overgrazing by wallabies.	On-going, 6 monthly	Council, Contractors	Very High
Planted woodland (breezeway)			
• Undertake a brief assessment of the breezeway prior to further planting. Balance requirements of plantings with knowledge of original vegetation community and habitat needs for key threatened species – e.g. Yellow-spotted Monitor.	ST	Council, Contractors, research institutions	Medium

Short-term (ST) = implemented within the next 12 months; Medium-term (MT) = implemented between year two to three; and Long-term (LT) = implemented between year three and five.

6.4 Weed management

Table 6-4 provides actions to protect and enhance native vegetation values and habitat within East Point Reserve through weed control. The objectives of this management element are to:

- Control or eliminate populations of declared and WONS weeds.
- Control and/or eliminate invasive environmental weed species that threaten habitat values.
- Map, monitor, and respond as appropriate, to weed invasions in the future.
- Ensure that weed control activities (e.g. use of chemicals) do not impact on the habitat and water quality.
- Ensure that all contractors undertaking weed control activities adhere to the strict hygiene protocols to ensure that weed species are not introduced or spread.
- Reduce fire risk posed by exotic grasses.
- Reduce the habitat modification resulting from invasion of exotic grasses.

To evaluate the success of management, monitoring and evaluation must be undertaken throughout the life of the plan. Regular weed monitoring by an appropriately-qualified botanist must be undertaken during the early wet and early dry season. Weed control contractors must formally report on all weed control activities undertaken – including targeted species, location, timing of works; herbicide type(s) and additives (e.g. surfactants), methods of application and dilution rates; other weed control techniques used (e.g. physical removal). The following performance indicators are provided to guide the evaluation of management success.

- Weed-management contractors are suitably qualified to differentiate native and weed species and are qualified for use of herbicides according to standard protocols.
- Implementation of weed hygiene protocols by all weed control contractors.
- Damage to non-target species is negligible.
- Reduce infestation size and density and prevent further spread of WONS and declared weeds.
- Eradication of high threat woody weeds – including Neem, Coffee Bush Mahogany by year 3 of the management plan.

Table 6-4. Weed management actions

Management Action	Timing	Responsibility	Priority
• Engage a contractor to undertake weed control across all reserve, including leaseholder land. This person(s) must be suitably qualified – i.e. have the required weed management and, importantly, plant identification skills to ensure that control works do not adversely impact on native vegetation and habitat values.	On-going	Council, weed management contractor	Critical
• All weed contractors and Council staff must adhere to the strict hygiene protocols to ensure that weeds are not introduced or further spread into the reserve.	On-going	Council, weed management contractor	Critical
• Contractor to refer to the Northern Territory Weed Management Handbook (DENR 2018) for detailed weed control methods – e.g. the amount of chemical used for specific species.	On-going	Council, weed management contractor	Critical
• Minimise non-target impacts on terrestrial and marine values through selection of appropriate herbicides and adherence to safety specifications.	On-going	Council, weed management contractor	Very High
• Contractor to comply with the City of Darwin Weed Management Guide (City of Darwin, 2012) o Purchase certified weed-free mulch and seed. o Restrict movement of vehicle and machinery where seeds are likely to spread. o Keep to established tracks and laneways so vehicle movement is concentrated. o Wash-down vehicles and equipment in appropriate wash-down bays.	On-going	Council, weed management contractor	Very high

○ Minimise exposure of disturbed areas as weeds readily colonise disturbed areas. ○ Appropriate weed management using controls outlined below. ○ Ensuring clean areas are worked first, followed by infested areas.			
• Maintain records of weed control, and report annually on weed control methods/results and adaptive responses.	On-going	Council, weed management contractor	Very High
• Weed contractors must report on targeted species, location, timing of works; herbicide type(s) and additives (e.g. surfactants), methods of application and dilution rates; other weed control techniques used (e.g. physical removal).	On-going	Council, weed management contractor	Very high
• Control Gamba Grass with a combination of physical (i.e. hand pulling), mechanical (such as slashing to prevent seed set) and chemical control (e.g. foliar spraying with glyphosate). The eradication process and targets under the statutory weed management plan for Gamba Grass (DENR 2018) should be implemented.	On-going	Council, weed management contractor	Critical
• Eradicate Neem plants. This can be achieved by hand-pulling seedlings and using the cut stump method for larger trees. Follow the statutory weed management plan for Neem (DENR 2015) for further details regarding eradications techniques.	On-going	Council, weed management contractor	Very High
• Control populations of declared Class B weeds – including Snakeweed, Hyptis, *Sida* spp. Sicklepod. Management should aim to control further spread as the likelihood of eradication is low. Treatment should occur prior to seeding. An integrated approach of hand pulling, slashing and chemical treatment may be necessary. Foliar spray treatment can be applied to actively growing plants. Follow-up of all treatments should be undertaken.	On-going	Council, weed management contractor	Very High
• Eradicate environmental woody weeds such as Coffee Bush. This can be achieved by hand-pulling seedlings and using the cut stump method for larger trees.	On-going	Council, weed management contractor	Very High
• Control high risk environmental weeds such as Annual Mission Grass. Annual Mission Grass can be managed through both physical and chemical treatment. Physical treatment can involve slashing or hand pulling, repeated as required, prior to seeding. Chemical treatment may be necessary for persistent individuals or where slashing and hand removal is not suitable. Chemical treatment is best implemented between December and March.	On-going	Council, weed management contractor	Critical
• Coordinate with NTG (Crown Lands) and undertake activities to control and eliminate weeds across the broader area.	On-going	Council, weed management contractor	High

Short-term (ST) = implemented within the next 12 months; Medium-term (MT) = implemented between year two to three; and Long-term (LT) = implemented between year three and five.

6.5 Pest animals

Table 6-5 provides actions to protect biodiversity values and minimise impacts of pest animals within East Point Reserve. The objectives of this management element are to:

- Control pest animals and decrease habitat suitability for invasive species.
- Reduce the impacts of pest animals on biodiversity values.
- Map, monitor, and respond as appropriate, to pest animal invasions in the future.
- Encourage and support leaseholders within the reserve to adopt actions outlined within this management plan and collaborate on control activities.
- Engage and educate the community and encourage participation in management activities where appropriate (e.g. toad busts).
- Support research into potential impacts associated with native (but non-indigenous) species.

To evaluate the success of management, monitoring and evaluation must be undertaken throughout the life of the plan. All pest animal monitoring and control efforts must be documented, with data stored appropriately and analysed to determine if objectives are being met. Adaptive response should be implemented as required. Monitoring and evaluation of this threat should also take into account population levels of native fauna species considered to be vulnerable to pest animals (e.g. Yellow-spotted Monitors, Northern Blue-tongued Skinks, Frilled Lizards). The following performance indicators are provided to guide the evaluation of management success.

- Reduction in Cane Toad numbers.
- No Cane Toad breeding within the reserve.
- No Feral Cats.
- Increase in species vulnerable to Cane Toad toxins (e.g. Yellow-spotted Monitors, Northern Blue-tongued Skinks Frilled Lizards).
- Community actively working to reduce pest animals and protect native species.
- Submission of pest animal records for use by Council.

Table 6-5. Pest animal management actions

Management Action	Timing	Responsibility	Priority
Cane Toads			
• Implement the full suite of actions outlined in the East Point Cane Toad Management Plan (EcOz 2022).	On-going	Council, stakeholders, BiodiversityWatch, community, research institutions	Critical
• Reduce toad numbers through active removal (collection via toad 'busts' or acoustic traps, euthanasia and disposal).	On-going	Council, BiodiversityWatch, community	Very High
• Minimise and eliminate water resources for toads (i.e. artificial water sources provide a dry season refuge for toads).	ST, On-going	Council	Very High
• Minimise toad recolonisation. Install and maintain a new toad exclusion fence. Undertake targeted trapping of toads with UV light/acoustic toad traps at incursion locations (i.e. entrance gates at Alec Fong Lim Drive). Control in surrounding residential areas.	ST, On-going	Council, BiodiversityWatch, community	Very High
• Remove foraging and shelter resources. (e.g. rubbish removal, audit and modification of lighting as required, drains and other infrastructure used for shelter.	ST, On-going	Council, leaseholders	Very High
• Continue monitoring and evaluation to determine the success of control on toads and flow on impacts to native species. Implement adaptive management as required.	ST, On-going	Council, BiodiversityWatch, research institutions	Very High
Feral Cats			
• Council to monitor and enforce by-laws for pet cats to ensure that they do not contribute to the Feral Cat population (e.g. cat containment and curfews, registration and desexing) program.	On-going	Council, pest animal contractors, BiodiversityWatch, research institutions	Very High
• Increase understanding of the presence, abundance and impacts of Feral Cats within the reserve. Control would need to be a community-wide approach as cats move across large distances. Coordination with surrounding stakeholders using an integrated approach would be required. A targeted control operation could be undertaken via trapping with Council staff; and lending traps to community members.	ST, On-going	Council, pest animal contractors, surrounding stakeholders, community	Very High

• Encourage staff, contractors and the community to maintain records of cat sightings via Feral Cat Scan (https://www.feralscan.org.au/feralcatscan/default.aspx).	On-going	Council, pest animal contractors, community	Very High
• Audit waste management and identify areas for improvement and elimination of potential resources for feral cat populations and/or introduced rodents.	ST– On-going	Council	Very High
• Engage a contractor to undertake Feral Cat control if required.	On-going	Council, pest animal contractors	Very High
Monitoring and evaluation			
• Document all actions undertaken as part of a feral animal control program.	On-going	Council, pest animal contractors, BiodiversityWatch, research institutions	Very High
Native species outside their original range			
• Support the investigation of potential impacts of *Carlia sexdentata* invasion of East Point and the greater Darwin area (e.g. potential competition, displacement and predation of native reptile and other invertebrate fauna.	LT	Council, research institutions	High
Stakeholder and community liaison			
• Implement an education program for stakeholders and the community regarding pest animals and impacts of domestic animals (e.g. benefits of reducing Feral Cat populations for people as well as wildlife, domestic cat containment and local laws, registration and desexing, refuges and breeding habitats for Cane Toads in residential gardens). Implement through an education leaflet/program, community events etc.).	On-going	Council	Very High
• Encourage residents to report the presence of pest animals through Feral Cat Scan or other citizen science platforms.	On-going	Council	Very High
• Engage the community and organise toad 'busting' nights during the wet season where toad populations are present.	On-going	Council, BiodiversityWatch	Very High

Short-term (ST) = implemented within the next 12 months; Medium-term (MT) = implemented between year two to three; and Long-term (LT) = implemented between year three and five.

6.6 Domestic animal management

Table 6-6 provides actions to protect biodiversity values through domestic animal management both within and surrounding East Point Reserve. The objectives of this management element are to:

- Outline Council's responsibility for domestic animal management.
- Identify any known or potential impacts from domestic animals within, or surrounding, the reserve.
- Minimise impacts of domestic animals on native fauna and habitat through monitoring and management of impacts (e.g. education, local law enforcement and on-ground management activities).

To evaluate the success of management, monitoring and evaluation must be undertaken throughout the life of the plan. Council should consider designing and implementing a monitoring program that can report on the efficacy of cat management by Council, the community and other stakeholders. Random patrols of the reserve and adjacent areas should be undertaken to ensure management measures are being followed and enforced. The following performance indicators are provided to guide the evaluation of management success:

- Compliance with dog and cat By Laws.
- Number of domestic cats and dogs roaming / captured by the community / Council staff.

Table 6-6. Domestic animal management actions

Management Action	Timing	Responsibility	Priority
• Review and update the old (2018-2022) City of Darwin Dog and Cat Management Strategy.	ST	Council	Very High
• Continue to undertake community and stakeholder engagement, and raise the awareness of the potential direct and indirect impacts of domestic cats and dogs.	ST	Council	Very High
• Enforce by-laws relating to domestic dogs and cats (e.g. number of animals, containment and curfews, registration and desexing).	ST	Council	Very High
• Continue exclusion of domestic dogs within the Reserve.	Ongoing	Council	Verry High
• Create a new measure to enforce dogs on leash along Colivas Road and Spot on Marine to minimise disturbance to roosting shorebirds within the Spot On Marine saltpan and other beach access points.	ST, Ongoing	Council	Very High
• Enforce fines on unrestrained dogs.	On-going	Council	Very High
• Trap domestic/stray/feral cats in the reserve and surrounds. Domestic/stray cats will be held for a period of time to allow retrieval by owners. Enforce fines for cat retrieval.	On-going	Council, NTG (Crown Lands), community	Very High
• Promote information to local residents about the health benefits of managing cat populations (cat health, human health, wildlife health).	ST	Council	Very High
• Continue to implement an incentive program for registration, identification and desexing packages, especially in areas of socioeconomic disadvantage.	ST	Council	Very High
• Encourage staff, contractors, the community and surrounding stakeholders to submit records of cat sightings via Feral Cat Scan (within and surrounding the reserve) (https://www.feralscan.org.au/feralcatscan/default.aspx).	ST	Council, NTG (Crown Lands), community, contractors	Very High
• Design and implement a monitoring program that can report on the efficacy of cat management by Council, the community and other stakeholders	ST	Council	Very High
• Document all trapping of cats undertaken by local residents.	ST	Council	Very High

Short-term (ST) = implemented within the next 12 months; Medium-term (MT) = implemented between year two to three; and Long-term (LT) = implemented between year three and five.

6.7 Water management

Table 6-7 outlines actions to manage artificial water sources and their potential impacts on biodiversity values within East Point Reserve. While it is recognised that watering must be undertaken to some extent for amenity purposes, the objectives of this management element are to:

- Reduce water availability for Cane Toads.
- Support revegetation where necessary.
- Maintain watering points for Agile Wallabies.
- Maintain amenity in key areas.

To evaluate the success of management, monitoring and evaluation must be undertaken throughout the life of the plan. Regular monitoring of water infrastructure is required and elimination/replacement as necessary. The following performance indicators are provided to guide the evaluation of management success.

- Completion of water audit.
- Eliminate unnecessary water infrastructure.
- No leaking watering points or other water infrastructure.
- Reduced number of Cane Toads over the dry season.

Table 6-7. Water management actions

Management Action	Timing	Responsibility	Priority
• Undertake an audit of all water use and infrastructure across the reserve (including leaseholder land) and development of a regular schedule for monitoring / maintenance.	ST	Council, Leaseholders	Critical
• Regularly monitor and maintain of all wallaby watering points, horse troughs and irrigation infrastructure (pipes, sprinklers and valve boxes) to ensure leaks do not occur.	ST, Ongoing	Council	Very High
• Where irrigation is necessary, change the timing so that water does not lie on the soil surface during the night when toads are active.	ST, Ongoing	Council	Very High
• Minimise lawn irrigation in the reserve and leaseholder properties – prioritise key sites where irrigation is critical to maintain amenity values	ST	Council, Leaseholders	Very High
• Implement periodic shutdowns of irrigation with the aim to desiccate and stress Cane Toads, thus lowering their survivorship.	ST, Ongoing	Council	Very High
• Modify or eliminate the water features at the Darwin Military Museum to ensure that toad breeding does not occur (i.e. raise the water pot so that toads cannot gain access or remove the pot).	ST	Council, Darwin Military Museum	Very High
• Decommission watering points where leaks continue to occur.	ST	Council	Very High
• Modify watering points to prevent pythons accessing float valve mechanisms (e.g. fix wire mesh over the box cover).	ST	Council	Very High
• Modify the raised irrigation valve boxes to exclude toads by either burying the boxes or raising the boxes above the ground to stop toads entering through the pre-cut hole in the box cover.	ST	Council	Very High
• Liaise with the Fannie Bay Equestrian Club to investigate options for an upgrade to the horse wash bay facility to enable water to quickly drain away.	ST	Council, Fannie Bay Equestrian Club	Very High
• Fill in depressions and ruts on tracks that allow water to pool during the wet season.	ST, Ongoing	Council	Very High
• De-silt drains and culverts so that water flows away quickly after rain events.	ST, Ongoing	Council, Leaseholders	Very High

Short-term (ST) = implemented within the next 12 months; Medium-term (MT) = implemented between year two to three; and Long-term (LT) = implemented between year three and five.

6.8 Fire management

Table 6-8 provides actions to manage fire and legislative requirements under the potential impacts on biodiversity values within East Point Reserve. Fire management is a legislative requirement for Council and surrounding stakeholders (e.g. NTG – Crown Lands) under the NT *Bushfire Management Act 2016*. The objectives of this management element are to:

- Comply with Bushfire Management Act 2016.
- Minimise risk to reserve users and surrounding residential development.
- Protect biodiversity values and minimise impacts of any fire management activities.
- Ensure that the frequency, timing and location of any planned burns take into account significant vegetation and threatened flora and fauna species.
- Ensure a rapid response in post-fire weed and pest animal control in the event of an unplanned fire.

To evaluate the success of management, monitoring and evaluation must be undertaken throughout the life of the plan. Review fire management actions every 12 months with incorporation of new information on threatened species populations and significant vegetation. The following performance indicators are provided to guide the evaluation of management success.

- Fire management obligations under the NT Bushfire Management Act are met (i.e. maintenance of firebreaks).
- Fire management activities have considered and minimised potential impacts to the ecological values of the reserve.

Table 6-8. Fire management actions

Management Action	Timing	Responsibility	Priority
• Continue fire management activities to comply with legislation (e.g. boundary/track/path maintenance) within the reserve.	Ongoing	Council, leaseholders, contractors	Critical,
• Maintain access of management gates, remove any surrounding vegetation and ensure that locks are in working order.	Ongoing	Council, contractors	Critical
• Undertaken education and compliance activities with surrounding residents to remove piles of green waste / grassy weed adjacent to properties and fence line (south-east firebreak).	ST, Ongoing	Council, community	Very High
• Clear fire breaks at least four times a year between April – August.	Ongoing, quarterly	Council, contractors	Critical
• Install three 50 m firebreaks manually perpendicular along Alec Fong Lim Road (south-west portion) and one 50 m firebreak from the main firebreak (northern portion) to ensure these breaks are adjoining the coast.	ST, Ongoing	Council, contractors	Very High
• Conduct a desktop environmental risk assessment prior to planned burns, considering fauna records and local knowledge. Protect threatened species and habitats, including monsoon vine patches, revegetation areas and mangroves.	Ongoing	Council, contractors	High
• Fuel reduction techniques (i.e. slashing of grass) should be undertaken along tracks adjacent to the monsoon vegetation to minimise the risk of fire spreading within sensitive vegetation communities. The need to slash for amenity and fire risk must be balanced with the need to enhance habitat condition and resource	ST, Ongoing	Council, contractors	High

availability for Yellow-spotted Monitors and Northern Blue-tongue Lizard etc – see actions for modified mowing regimes in grassy vegetation - Table 6-3			

Short-term (ST) = implemented within the next 12 months; Medium-term (MT) = implemented between year two to three; and Long-term (LT) = implemented between year three and five.

6.9 Planning and land acquisition

Table 6-9 provides actions to increase the long-term security and augment East Point Reserve through land acquisition. The objectives of this management element are to:

- Ensure the long-term security of the reserve by using all available tools in the Planning Scheme.
- Ensure that zones and overlays better reflect the biodiversity values of the reserve.
- Augment East Point biodiversity values through the acquisition of key land parcels adjoining the reserve.

The following performance indicators are provided to guide the evaluation of management success.

- The site security of the reserve is appropriately protected through all relevant tools available in the planning scheme.
- Lot 5984 (Crown land parcel) is secured and managed for conservation values as part of the East Point Reserve.

Table 6-9. Planning and land acquisition management actions

Management Action	Timing	Responsibility	Priority
• Council to review planning scheme tools associated with the reserve and, if necessary, consider pursuing a Planning Scheme amendment to rezone areas within the reserve to a more appropriate conservation-focused zoning – i.e. Conservation Zone (CN).	LT	Council	High
• Continue to pursue the transfer of Crown Land parcel (Lot 5984) to Council ownership or long-term management agreement.	LT	Council, Northern Territory Government.	Very High

Short-term (ST) = implemented within the next 12 months; Medium-term (MT) = implemented between year two to three; and Long-term (LT) = implemented between year three and five.

6.10 Education and research opportunities

East Point Reserve offers opportunities to establish education and research within a high value biodiversity reserve close to the city of Darwin. The Council should also seek to collaborate with research institutions and other organisations to gain a greater understanding of the biodiversity values and threats within the reserve. Potential research ideas and knowledge gaps are provided below.

The reserve also provides outstanding nature-based recreation opportunities (e.g. bushwalking, birdwatching, citizen science) that could increase knowledge and awareness of local biodiversity values, and thus create a sense of ownership and greater stewardship by the local community. Most members of the public are likely to have a poor understanding of the biodiversity values of the area, and education campaigns can be used to illustrate these values, and threats which may arise in the urbanised area. Public education using a variety of media can help create community understanding about environmental issues and management by the City of Darwin. Media options range from local newspapers, radio, websites (including social media), publications, mail-outs, interpretive signage and direct discussions with key stakeholders. The information provided should target people most likely to utilise the areas, such as local residents, commercial operators, local businesses and school

groups. The City of Darwin can play an integral role in community education of environmental values and in the support of community led initiatives. Ideas for education activities are provided below in Table 11.

The objectives for this management element are to:

- Increase knowledge and awareness of local biodiversity values within the reserve and thus create a sense of ownership and greater stewardship by the local community.
- Seek opportunities to collaborate or support research institutions and other organisations.
- Fill knowledge gaps for threatened species and threat mitigation.

To evaluate the success of management, monitoring and evaluation must be undertaken throughout the life of the plan. Council should document community involvement in biodiversity events, workshops and citizen science projects to track participation, interest and the number of community members acting for nature. Consider ways to improve engagement and increase participation over the life of the five-year management plan. The following performance indicators are provided to guide the evaluation of management success.

- Stakeholders and community are actively working to protect and enhance biodiversity values within the reserve
    - The number of people involved in biodiversity related events/workshops / toad busts / shorebird counts etc. is increasing over the life of the plan.
    - The number of events held by Council or stakeholders to promote biodiversity values.
- The number of projects where Council collaborates with stakeholders and key partners to deliver biodiversity outcomes and fill knowledge gaps.

Table 6-10. Education and research management actions

Management Action	Timing	Responsibility	Priority
Community Education, Engagement and Collaboration			
• Continue to engage the key stakeholders through the East Point Environment Advisory Committee.	Ongoing	Council	Very High
• Collaborate and coordinate actions and share information with key stakeholders – e.g. Cane Toad busts, weed management, Yellow-spotted Monitor population management.	ST – Ongoing	Council, leaseholders	Very High
• Investigate opportunities for public involvement in monitoring activities. Create new or join existing citizen science projects – promote the use of iNaturalist for flora and fauna observations or the NT Fauna Atlas. Other citizen science platforms such as the Australian Museum Frog ID phone app and/or Birdlife Australia Backyard Bird Count can be used during events and/or promoted for use by individuals. Threats such as feral cats and weeds can also be documented on FeralCatScan or Weedscan.	ST - Ongoing	Council, community	Very High
• Support suitable nature-based recreation and education within the reserve – e.g. breakfast with the birds, toad busting, flora and fauna walks and talks.	Ongoing	Council, friends of East Point	Very High
• Maintain, update and provide new interpretive signage in areas of interest (i.e. shorebirds and threats from disturbance.	MT, Ongoing	Council, Birdlife Top End	Very High
• Encourage public consultation during environmental projects (i.e. Yellow-spotted Monitor surveying or alteration of mowing regimes to increase habitat values for Yellow-spotted Monitors.	Ongoing	Council	Very High
• Provide support and resources for the Friends of East Point Reserve. Support could be in the form of provision of meeting rooms, training, and small grants for environmental projects.	ST, Ongoing	Council	High
• Consider providing an environmental newsletter that promotes values, creates awareness on threats and promotes environmental events within the local community (e.g. email or mail out, website download).	MT, Ongoing	Council	High
• Support nature-based school excursions (flora and fauna).	Ongoing	Council	High

Research / knowledge gaps			
• Liaise with Birdlife Australia to share their shorebird count data and evidence of impacts from reserve use on shorebird populations and habitat i.e. disturbance by people, dogs, boats and other offshore activities.	Ongoing	Council, Birdlife Top End	Very high
• Support stakeholders or seek funds to collect baseline data for Northern Blue-tongued Lizard, Mitchell Water Monitor and Yellow-spotted Monitor populations to inform management decisions.	MT	Council, Biodiversity Watch, research institutions, contractors	Very High
• Liaise with MAGNT, DEPWS and/or research institutions interested in undertaking genetic analysis of Northern Blue-tongued Skinks as part of a larger assessment. Individuals can be captured for genetic assessment using cage traps and hand-capture.	LT	Council, MAGNT, DEPWS, research institutions	High
• Collaborate with partners to gather additional data of population trends in the Yellow-spotted Monitor population, susceptibility / aversion to Cane Toads, development of rigorous monitoring methods, radio track individual Yellow-spotted Monitors (home range, time budgets, distances travelled, social behaviour, location of nesting / denning, dispersal routes, survival rates, diet and foraging behaviour and causes of mortality), and genetic analysis to understand population trends and connectivity beyond East Point Reserve.	MT-LT	Council, MAGNT, CDU and other universities, BiodiversityWatch	High
• Develop a comprehensive translocation / reintroduction plan for Atlas Moth. Understanding the relative importance of various food plants for larval development, investigating the main causes of mortality at various life stages, optimising release numbers to maximise the success of a translocation program, genetic analysis.	MT	Council, contractors, DELWP, MAGNT, research institutions	Very High
• Support the investigation of potential impacts of *Carlia sexdentata* invasion of East Point and the greater Darwin area (e.g. potential competition, displacement and predation of native reptile and other invertebrate fauna.	LT	Council, research institutions	High
• Support the investigation of biodiversity values and collection of baseline data for other flora and fauna communities and species that have not been the traditional focus for management: i.e. terrestrial invertebrates, intertidal and marine species and communities.	LT	Council, MAGNT, Charles Darwin University or other research institutions,	High

Short-term (ST) = implemented within the next 12 months; Medium-term (MT) = implemented between year two to three; and Long-term (LT) = implemented between year three and five.

7 MONITORING AND EVALUATION

To assess the success of management actions within the reserve, monitoring must be undertaken – and the data evaluated – to inform adaptive management responses. Monitoring is briefly discussed under each management element. The following generic recommendations are made in regard to monitoring, evaluation and review of management action and plan success:

- Use performance indicators associated with each management element to evaluate the success of actions.
- Data must be systematically collected and stored appropriately. Document the activity type, timing, frequency, extent and outcomes to enable evaluation of management actions.
- Monitoring methods must be standardised and repeatable to allow comparison across years.
- Use data to determine adaptive management responses where required.
- Assign Council staff to report annually on the progress of the plan implementation.

The Biodiversity Management Plan must be reviewed and updated at the end of the five-year management period (i.e. 2029).

8 IMPLEMENTATION SCHEDULE

A summary of the actions for each management element is provided below, along with their priority and timing within the life of the five-year management plan.

Table 8-1. Summary of biodiversity management actions and schedule within East Point Reserve.

Short-term (ST) = implemented within the next 12 months; Medium-term (MT) = implemented between year two to three; and Long-term (LT) = implemented between year three and five

	2024				2025				2026				2027				2028				2029			
Action	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Significant Fauna Species (see also Table 6-1)																								
General fauna monitoring																								
Targeted surveys for key species every 2-3 years, using standardised survey techniques. Seasonal timing will vary depending on species (**Timing** – MT, ongoing, **Priority** – Very High)																								
Stakeholder engagement and community liaison																								
Encourage staff and the general public to submit records of threatened species with corroborating photos to the NT Fauna Atlas or iNaturalist (**Timing** – ongoing, **Priority** – Very High).																								
Raise awareness of lesser-known threatened species i.e. Mitchell's Water Monitor (**Timing** – ongoing, **Priority** – High).																								

	2024				2025				2026				2027				2028				2029			
Action	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Share information and seek opportunities with partners and stakeholders to fill knowledge gaps on threatened species (see Section (**Timing** – ongoing, **Priority –** High).																								
Engage citizen scientists to support conservation programs (e.g. Northern Blue-tongued Skinks - by identifying individual skinks on camera images in association with a population monitoring program) (**Timing** – MT, **Priority** – High).																								
Northern Blue-tongued Skink and Mitchell's Water Monitor																								
Seek funding to implement a standardised, long-term, population monitoring program within, and surrounding, East Point to better understand the population and long-term sustainability. **(Timing** - MT, **Priority** – Very High).																								
Northern Brushtail Possum																								
Monitor key threats to Northern Brushtail Possums within East Point (i.e. feral, stray and domestic cats) (**Timing** – ongoing, **Priority** – Very High).																								
Raise awareness of possums, their ecology, conservation status and decline across their range due to a vast array of threatening processes (**Timing** – ongoing, **Priority – High)**																								

	2024				2025				2026				2027				2028				2029			
Action	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Monitor population through targeted fauna surveys **(Timing -** 2-3 yearly, **Priority – High)**																								
Yellow-spotted Monitor																								
Council to support and seek funds to continue long-term monitoring for varanids. Standardised survey methods must be developed, increasing area of assessment across the reserve **(Timing -** every 2 year, ongoing, **Priority** – Very High).																								
Council to consider partnering with research institutions to radio track individual Yellow-spotted Monitors (**Timing** - LT, **Priority** – High).																								
Council to support stakeholders to undertake genetic assessment on Yellow-spotted Monitors (**Timing** – as required, **Priority** – High).																								
Habitat protection and enhancement																								
Implement actions within the East Point Cane Toad Management Plan (EcOz 2022) to reduce toad numbers and habitat suitability for this invasive species (**Timing** – ST, ongoing, **Priority** – Critical).																								
Trial a modified mowing regime and retain multiple wide strips (each strip at least 30m wide and 50 cm height) of unmown grassy habitat (**Timing** – ST, ongoing, **Priority** – Very High).																								

	2024				2025				2026				2027				2028				2029			
Action	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Monitor impacts and populations of feral and domestic cats **(Timing** – ongoing, **Priority** – Very High).																								
Migratory Shorebirds																								
Continue exclusion of domestic dogs within the reserve (**Timing** – ongoing, **Priority** – Very High)																								
Council to consider enforcing dogs on leash along Colivas Road and Spot on Marine to minimise disturbance to shorebirds (**Timing** – ST, ongoing, **Priority** – Very High).																								
Monitor and strengthen exclusion of access to Spot on Marine (i.e. barriers or fencing to ensure vehicles do not enter) (**Timing** – ST, Ongoing, **Priority** – Very Hogh)																								
Promote shorebird education and awareness through community engagement and events in collaboration with Birdlife Top End. (**Timing** - Twice annually – start and end of the migratory season, **Priority** – Very High).																								
Install educational signs with species identification, ecology. threats and measures to support shorebird conservation **(Timing** - ST, **Priority** – High)																								

	2024				2025				2026				2027				2028				2029			
Action	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Investigate the installation of a bird viewing platform (with appropriate assessments and consultation from experts) that overlooks either the western rocky reef, or the rocks at Dudley Point (**Timing** - LT, **Priority** – High)																								
Consider excluding public access to shorebird roosting sites to ensure a minimisation of potential disturbance impacts (**Timing** – MT, ongoing, **Priority** – High).																								
Council to pursue acquisition of the eastern portion of Lot 5984) to augment shorebird habitat (**Timing** – LT, **Priority** – High).																								
Atlas Moth																								
Continue to monitor the success of the Atlas Moth reintroduction (search for eggs and larvae and light trapping to determine the presence of adults) (**Timing** - ongoing, annually conducted toward the end of the wet season, **Priority** – High).																								
Council to seek a detailed reintroduction / translocation plan with support from DEPWS, MAGNT and research institutions (**Timing** – MT, **Priority** – High).																								

Action	2024				2025				2026				2027				2028				2029			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Supplementary plant ***Pittosporum moluccanum*** and other larval food plants (***Croton habrophyllus*** and ***Litsea glutinosa***) within existing patches of monsoon forest **(Timing** Early wet season, annually if required**, Priority** – High).																								
Non-threatened key fauna (see also Table 6-2)																								
Non-threatened reptiles																								
Council to work with partners and/or seek funds for targeted monitoring of key reptile species vulnerable to the impacts of Cane Toads (e.g. Frilled Lizards). Determine baseline population levels to inform adaptive management actions **(Timing** – timing will vary depending on species, **Priority** – Very High)																								
Agile Wallabies																								
Determine Agile Wallaby carrying capacity of East Point Reserve – this will provide a threshold for adaptive management intervention (**Timing –** MT**, Priority** – Very High).																								
Regularly monitor and maintain wallaby watering points to ensure leaks do not occur and provide refuge for Cane Toads. Leaking troughs should be decommissioned **(Timing** – ongoing, **Priority** – Very High).																								

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	2024				2025				2026				2027				2028				2029			
Action	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Minimise irrigation of lawns. If irrigation is proposed to continue, implement periodic shutdowns with the aim to desiccate and stress Cane Toads, thus lowering their survivorship (**Timing** – ongoing, dry season, **Priority** – Very High).																								
Monitor grassy areas for evidence of overgrazing by wallabies (**Timing** – ongoing, dry season, **Priority** – Very High).																								
Continue biannual surveys. Review data and analyse for rapid increases in population growth (increasing population counts over 6 months) (**Timing** - biannual, wet and dry season, **Priority** – Very High)																								
Consider increasing the accuracy of wallaby counts through the use of thermal imagery drones (**Timing** – Biannual, ongoing, **Priority** – Very High).																								
Dingoes																								
Install interpretive signage providing information on Dingoes, their biology/ecology, their role in in the ecosystem and discourage inappropriate human behaviour (**Timing** – ST, **Priority** – Very High).																								

Action	2024				2025				2026				2027				2028				2029			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Record and submit records of Dingoes to the NT Fauna Atlas. Use for assessment and comparison across years (**Timing** – ongoing, **Priority** – Very High).																								
Ensure that food scraps / bins do not attract dingoes (**Timing** – ongoing, **Priority** – Very High).																								
Native Vegetation (see also Table 6-3)																								
Revegetation monitoring																								
Continue to monitor the health and condition of revegetation areas (**Timing** – MT, **Priority** – High).																								
Monsoon forest																								
Supplementary plant *Pittosporum moluccanum*, *Croton habrophyllus* and *Litsea glutinosa* within existing patches of monsoon forest (**Timing** – ST, early wet season 2024, annually if required, **Priority** – High).																								
Modified grasslands																								
Trial the modification of mowing regimes and retain multiple wide strips (each strip at least 30m wide and 50 cm height) of unmown grassy habitat to increase habitat condition and resources for key fauna species (**Timing** – ongoing, **Priority** – Very High).																								

Action	2024				2025				2026				2027				2028				2029			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Planted Woodland (Breezeway)																								
Undertake a brief assessment of the breezeway prior to further planting. Balance requirements of plantings with fire management requirements, knowledge of original vegetation community and habitat needs for key threatened species (**Timing** – ST, **Priority** – Medium)..																								
Weed Management (see also Table 6-4)																								
Contractors must adhere to hygiene protocols to minimise weed introduction and spread (**Timing** – ongoing, **Priority** – Critical).																								
Engage a suitably qualified contractor to undertake weed control across all reserves (**Timing** – ongoing, **Priority** – Critical).																								
Weed control to comply with the Northern Territory Weed Management Handbook (DENR 2018) and City of Darwin Weed Management Guide (City of Darwin, 2012) (**Timing** – ongoing, **Priority** – Critical).																								
Maintain records of weed control and report annually (methods/results and adaptive responses) (**Timing** – ongoing, **Priority** – Very High**).**																								

	2024				2025				2026				2027				2028				2029			
Action	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Control Gamba Grass with integrated approach (**Timing** – prior to seed set, early wet, **Priority** – Critical).																								
Eradicate Neem plants. Hand-pull seedlings or cut stump method for larger trees (**Timing** - ongoing, **Priority** – Very High).																								
Control populations of declared Class B weeds – including Snakeweed, Hyptis, *Sida* spp. Sicklepod. Control spread and treat plants prior to seeding using an integrated approach (**Timing** – ongoing, **Priority –** Very High**).**																								
Eradicate environmental woody weeds - Coffee Bush. Hand-pull seedlings and use the cut stump method for larger trees (**Timing** – ongoing, **Priority** – Very High).																								
Control high risk environmental weeds -Annual Mission Grass. Use integrated approach of physical and chemical treatment. **(Timing –** ongoing between December and March, **Priority** – Critical).																								
Council and NTG (Crown Lands) to coordinate weed control activities across boundaries (**Timing** – ongoing, **Priority –** Very High).																								

	2024				2025				2026				2027				2028				2029			
Action	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Weed contractors must consider non-target impacts and adhere to guidelines for herbicide use (**Timing** – ongoing, **Priority** – Very High).																								
Pest Animals (see also Table 6-5)																								
Cane toads																								
Council in collaboration with the community must continue to reduce toad numbers through active removal (collection via toad "busts" or acoustic traps, euthanasia and disposal) (**Timing** – ongoing, **Priority –** Very High**).**																								
Minimise and eliminate water resources for toads (i.e. artificial water sources provide a dry season refuge for toads) (**Timing** – ongoing, **Priority** –Very High).																								
Minimise toad recolonisation. Install and maintain a new toad exclusion fence. Undertake targeted trapping of toads with UV light/acoustic toad traps at incursion locations (i.e. entrance gates at Alec Fong Lim Drive). Control in surrounding residential areas (**Timing** – ongoing, **Priority** – Very High).																								
Remove foraging and shelter resources. (e.g. rubbish removal, audit and modification of lighting as required, drains and other infrastructure used for shelter																								

	2024				2025				2026				2027				2028				2029			
Action	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
(**Timing** – ongoing, **Priority** – Very High).																								
Continue monitoring and evaluation to determine the success of control on toads and flow on impacts to native species. Implement adaptive management as required (**Timing** – ongoing, **Priority** – Very High).																								
Feral cats																								
Monitor impacts and population of feral cats to determine the requirements for control. A community-wide, integrated approach, coordinating with surrounding stakeholders would be required (**Timing** – ongoing, **Priority** – Very High).																								
Audit waste management and identify areas for improvement and elimination of potential resources for feral cat populations and/or introduced rodents (**Timing** – ST, **Priority** – Very High).																								

Action	2024				2025				2026				2027				2028				2029			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Stakeholder and Community Liaison																								
Implement an education program on impacts of pest and domestic animals (**Timing** – On-going, **Priority** – High).																								
Encourage residents to report the presence of pest animals through Feral Cat Scan or other citizen science platform (**Timing** – On-going, **Priority** – High).																								
Engage the community and organise toad 'busting' nights during the wet season where toad populations are present (**Priority –Very High, Timing** – On-going).																								
Domestic Animals (see also Table 6-6)																								
Review and update the old (2018-2022) City of Darwin Dog and Cat Management Strategy (**Timing** – ST, **Priority** – Very High).																								
Continue to undertake community and stakeholder engagement and raise the awareness of the potential direct and indirect impacts of domestic cats and dogs (**Timing** – ongoing, **Priority** – Very High).																								
Enforce by laws relating to domestic dogs and cats (**Timing** – ongoing, **Priority** – Very High).																								
Continue exclusion of domestic dogs within the reserve (**Timing** – ongoing, **Priority** – Very High).																								

Action	2024				2025				2026				2027				2028				2029			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Council to consider new restrictions to enforce dogs on leash along Colivas Road and Spot on Marine to minimise disturbance to roosting shorebirds (**Timing** – ST, ongoing, **Priority** – Very High).																								
Continue to implement an incentive program for registration, identification and desexing packages (**Timing** – ongoing, **Priority** – Very High).																								
Design and implement a monitoring program that can report on the efficacy of cat management (**Timing** – ongoing, **Priority** – Very High).																								
Document all trapping of cats undertaken by local residents (**Timing** – ongoing, **Priority** – Very High).																								
Encourage local residents to report observations of cats within the reserve via Feral Cat Scan (**Timing** – ongoing, **Priority** - Very High).																								
Water Management (see also Table 6-7)																								
Undertake an audit of all water use and infrastructure across the reserve and develop a regular schedule for monitoring / maintenance (**Timing** – ST, **Priority** – Critical).																								

Action	2024				2025				2026				2027				2028				2029			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Regularly monitor and maintain all water infrastructure to ensure leaks do not occur (**Timing** – ongoing, **Priority** – Very High).																								
Minimise lawn irrigation (within leaseholder properties as well) – Where necessary, change the timing so that water does not lie on the soil surface during the night when toads are active and implement periodic shutdowns to desiccate toads during the dry season (**Timing** – ongoing, **Priority** – Very High).																								
Modify the raised irrigation valve boxes to exclude toads by either burying the boxes or raising the boxes above the ground to stop toads entering through the pre-cut hole in the box cover (**Timing** – ST, **Priority** – Very High).																								
Liaise with the Fannie Bay Equestrian Club to investigate options for an upgrade to the horse wash bay facility to enable water to quickly drain away (**Timing** – ST, **Priority** – Very High).																								
De-silt drains and culverts and fill in depressions and ruts on tracks that allow water to pool during the wet season (**Timing** – wet season, ongoing **Priority** – Very High).																								

Action	2024				2025				2026				2027				2028				2029			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Fire Management (see also Table 6-8)																								
Continue fire management activities to comply with legislation (e.g. firebreaks, track/path maintenance) within the reserve (**Timing** – ongoing, **Priority** – Critical).																								
Clear fire breaks **(Timing,** ongoing, at least four times a year between April – August, **Priority** – Critical).																								
Maintain access of management gates, remove any surrounding vegetation and ensure that locks are in working order (**Timing** – Ongoing, **Priority** – Critical).																								
Monitor, remove piles of green waste and grassy weeds adjacent to properties and fence line (south-east firebreak). Undertake education campaign with adjoining residents and undertake enforcement if required (**Timing** – ongoing, **Priority** – Critical).																								
Install three 50 m firebreaks manually perpendicular along Alec Fong Lim Road (south west portion) and one 50 m firebreak from the main firebreak (northern portion) to ensure these breaks are adjoining the coast (**Timing** – ST, Ongoing, **Priority** – Very High).																								

Action	2024				2025				2026				2027				2028				2029			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Slashing should be undertaken along tracks adjacent to the monsoon vegetation to minimise the risk of fire spreading within sensitive vegetation communities. (**Timing** – Ongoing, **Priority** – High).																								
Site Security and Land Acquisition																								
Council to investigate the benefits of a Planning Scheme amendment to rezone parts of the reserve to a more appropriate conservation-focused zoning – i.e. Conservation Zone (**Timing** - LT, **Priority** – Very High).																								
Continue to pursue the transfer of crown land parcel (Lot 5984) to Council ownership or a long-term management agreement (**Timing** - LT, **Priority** – Very High).																								
Education and Research																								
Community education, engagement and collaboration																								
Council will continue to engage the key stakeholders through the East Point Environment Advisory Committee (**Timing** – Ongoing, **Priority** – Very High).																								

	2024				2025				2026				2027				2028				2029			
Action	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Council must collaborate and coordinate actions and share information with key stakeholders (i.e. Cane Toad busts, weed management, Yellow-spotted Monitor population management (**Timing** – ST – Ongoing, **Priority** – Very High).																								
Council should investigate opportunities for public involvement in monitoring activities: flora and fauna observations submitted via iNaturalist, the Australian Museum Frog ID app and/or Birdlife Australia Backyard Bird Count can be used during events and/or promoted for use by individuals. Threats such as feral cats and weeds can also be documented on FeralCatScan or Weedscan (**Timing** – ST -Ongoing, **Priority** – Very High).																								

	2024				2025				2026				2027				2028				2029			
Action	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Council should support suitable nature-based recreation and education within the reserve e.g. breakfast with the birds, toad busting, flora and fauna walks and talks, school excursions (**Timing** – ongoing, **Priority** – Very High).																								
Council will maintain, update and provide new interpretive signage in areas of interest (i.e. shorebirds and threats from disturbance (**Priority** – Very High, **Timing** – MT – Ongoing).																								
Council should provide support and resources for the Friends of East Point reserve. Support could be in the form of provision of meeting rooms, training, and small grants for environmental projects (**Timing** – ST, Ongoing, **Priority** – High).																								
Council should consider providing an environmental newsletter that creates awareness of values, threats and promotes environmental events within the local community (**Timing** – MT, Ongoing, **Priority** – High).																								
Research/ knowledge gaps																								

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	2024				2025				2026				2027				2028				2029			
Action	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Council to liaise with Birdlife to share their shorebird count data and evidence of impacts i.e. disturbance by people, dogs, boats and other offshore activities **(Timing – ongoing, Priority – Very High).**																								
Collection of baseline data for Northern Blue-tongued Lizard and Mitchell Water Monitor populations to inform management decisions (**Timing – MT, Priority – Very High).**																								
Council to liaise with DEPWS and research institutions interested in undertaking genetic analysis of Northern Blue-tongued Skinks as part of a larger assessment. Individuals can be captured for genetic assessment using cage traps and hand-capture **(Timing – LT, Priority –High).**																								
Council will collaborate with partners to gather additional data of population trends in the Yellow-spotted Monitor population, susceptibility / aversion to Cane Toads, development of rigorous monitoring methods, and genetic analysis to understand connectivity beyond East Point Reserve **(Timing – ongoing, Priority – Very High).**																								

	2024				2025				2026				2027				2028				2029			
Action	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Council to consider partnering with research institutions to radio track individual Yellow-spotted Monitors (**Timing - LT, Priority – High).**																								
Council to support research institutions and other stakeholders to undertake genetic assessment on Yellow-spotted Monitors within the reserve and across the broader Darwin region **(Timing** – as required, **Priority – High).**																								

9 REFERENCES

Albrecht, M., Schmid, B., Obrist, M.K., Schüpbach, B., Kleijn, D. and Duelli, P. (2010). Effects of ecological compensation meadows on arthropod diversity in adjacent intensively managed grassland. *Biological Conservation*, 143(3), pp.642–649. doi:https://doi.org/10.1016/j.biocon.2009.11.029.

Allen, B., Allen, L., and Leung, K. (2015). Interactions between two naturalized invasive predators in Australia: are feral cats suppressed by dingoes? Biological Invasion 17, pp 761 – 776

AWC (unpublished data). Records of Mitchell's water monitor from Australian Wildlife Conservancy sanctuaries and partnerships across the Kimberley WA and the Top End of the NT. Includes cane toad records in the Kimberley. Provided by email on 1 March 2022 and 5 April 2023 (for WA), and 25 April 2022 (for NT).

Braby, MF & Nielsen, J 2011, 'Review of the conservation status of the Atlas Moth, Attacus wardi Rothschild, 1910 (Lepidoptera: Saturniidae) from Australia', *Journal of Insect Conservation*, vol. 15, no. 4, pp. 603–608.

Brook, L., Johnson, C., Ritchie, E. (2012) Effects of predator control on behaviour of an apex predator and indirect consequences for mesopredator suppression. Journal of Applied Ecology, Volume 49, pp 1278-1286.

Brown, G.P., Kelehear, C., Shine, R., (2011) Effects of seasonal aridity on the ecology and behaviour of invasive cane toads in the Australian wet-dry tropics. Function Ecology 25: 1339 -1347.

Buckley, K., Parkin, T., Einoder, L., and Gillespie, G. (2016). East Point Reserve and Nightcliff foreshore vertebrate fauna survey. Report prepared for City of Darwin by Flora and Fauna Division, Department of Land Resource Management, Northern Territory Government, Palmerston.

City of Darwin (2018). *Dog and Cat Management Strategy 2018-2022*. [online] Available at: https://www.darwin.nt.gov.au/sites/default/files/page/file/cod_dogcat_strategy_fa_web.pdf [Accessed 21 Nov. 2023].

City of Darwin (2020). *Animal Management Policy No. 0001.100.E.R*. [online] Available at: https://www.darwin.nt.gov.au/sites/default/files/publications/attachments/0001%20Animal%20Management%20Policy.pdf .

City of Darwin (2021). East Point Reserve Advisory Committee . [online] Available at: https://www.darwin.nt.gov.au/sites/default/files/publications/attachments/East%20Point%20Reserve%20Advisory%20Committee%20-%20Terms%20of%20Reference_1.pdf [Accessed 1 Dec. 2023].

City of Darwin (2023). Animals and Pets. [online] City of Darwin | Darwin Council, Northern Territory. Available at: https://www.darwin.nt.gov.au/transforming-darwin/innovation/yourdarwin/safe-liveable-healthy/animals-pets [Accessed 21 Nov. 2023].

Clemens, R. (2016). Ecology and conservation of Australia's shorebirds. Thesis submitted for the degree of Doctor of Philosophy at The University of Queensland.

Cogger H.G. (2014) Reptiles and Amphibians of Australia (7th ed.) CSIRO Publishing, Collingwood, Victoria.

de Laive, A., Schembri, B. and Jolly, C., (2021). Novel habitat associations and seasonality in threatened Mitchell's water monitors (*Varanus mitchelli*): Implications for conservation. *Austral Ecology*, 46(5), pp. 871-875.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2021, Conservation Advice for Trichosurus vulpecula arnhemensis (Northern Brushtail Possum).

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023, Threatened Species of the Northern Territory – Mitchells Water Monitor.

https://www.environment.gov.au/biodiversity/threatened/species/pubs/1569-conservation-advice-21122023.pdf [Accessed 14 Jan 2024].

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023, Conservation Advice for Tiliqua scincoides intermedia (northern blue-tongue skink), https://www.environment.gov.au/biodiversity/threatened/species/pubs/89838-conservation-advice-21122023.pdf [Accessed 14 Jan 2024].

Department of Environment, Parks and Water Security (DEPWS). (2021). Threatened species of the Northern Territory - Atlas Moth. https://nt.gov.au/__data/assets/pdf_file/0004/206518/atlas-moth.pdf [Accessed 18 Dec 2023]

Doherty, T., Davis, R., van Etten, E., Alger, D., Collier, N., Dickman, C., Edwards, G, Masters, P., Palmer, R., and Robinson, S. (2015). A continental-scale analysis of feral cat diet in Australia. Journal of Biogeography, 42: 964-975.

Doody, J.S., Green, B., Sims, R., Rhind, D., West, P. and Steer, D. (2006). Indirect impacts of invasive cane toads (Bufo marinus) on nest predation in pig-nosed turtles (Carettochelys insculpta). *Wildlife Research*, 33(5), p.349. doi:https://doi.org/10.1071/wr05042.

Doody JS, Green B, Rhind D, Castellano CM, Sims R & Robinson T (2009). Population-level declines in Australian predators caused by an invasive species. Animal Conservation 12: 46–53.

Doody JS, Soanes R, Castellano CM, Rhind D, Green B, McHenry CR & Clulow S (2015) Invasive toads shift predator-prey densities in animal communities by removing top predators. Ecology 96, 2544–2554.

DSEWPC (2011) Threat Abatement Plan for the biological effects, including lethal toxic ingestion, caused by Cane Toads. Australian Government Department of Sustainability, Environment, Water, Population and Communities

EcOz. (2013a). East Point Reserve biodiversity assessment. Report prepared for City of Darwin.

EcOz. (2013b). Reintroduction of the Atlas Moth (*Attacus wardii*) to East Point Reserve. Report prepared for City of Darwin.

EcOz. (2014). East Point Reserve - baseline vegetation monitoring survey. Report prepared for City of Darwin.

EcOz. (2015). East Point Reserve biodiversity 5 year management plan 2014-2018. Report prepared for the City of Darwin.

EcOz. (2017a). Vegetation mapping of East Point (east section). Report prepared for City of Darwin.

EcOz. (2017b). Flora survey of East Point: Monsoon rainforest. Report prepared for City of Darwin.

EcOz. (2017c). East Point weed survey report. Report prepared for City of Darwin.

EcOz. (2021). East Point Reserve Weed Survey Report 2021. Report prepared for City of Darwin.

EcOz. (2021). Cane Toad Surveys and Management Plan East Point Reserve. Report prepared for City of Darwin.

EcOz. (2023). East Point Reserve Fauna Survey 2023. Report prepared for City of Darwin.

Frank, A., Johnson, C., Potts, J., Fisher, A., Lawes, M., Woinarski, J., Tuft, K., Radford, I., Gordon, I., Collis, M., Legge, S. (2014). Experimental evidence that feral cats cause local extirpation of small mammals in Australia's tropical savannas. Journal of Applied Ecology, 51: 1486-1493.

Franklin, D., Matthews, R., and Lawes, M. (2010). History of the East Point monsoon forest. Northern Territory Naturalist, 22: 2 - 16.

Humbert, J.-Y., Ghazoul, J., Richner, N. and Walter, T.R. (2012). Uncut grass refuges mitigate the impact of mechanical meadow harvesting on orthopterans. *Biological Conservation*, 152, pp.96–101. doi:https://doi.org/10.1016/j.biocon.2012.03.015.

Lane, D. A., Martin, G. and Weir, R. P. (2010) 'The life history of "Attacus wardi" Rothschild (Lepidoptera: Saturniidae) from the Northern Territory, Australia', Australian Entomologist. Brisbane, Qld.: Entomological Society of Queensland, 37(3), pp. 115–127. https://search.informit.org/doi/10.3316/informit.296963479547799.

Lilleyman, A., Lawes, M., and Garnett, S. (2015). Final report project 13-0379 – Darwin - East Arm project. Report to the Northern Territory Government, Darwin NT.

Lippiatt, D. (2015). Cane Toads of East Point Reserve project report. Report produced for City of Darwin.

Mayer M, Brown GP, Zimmermann B, Greenlees MJ & Shine R (2015) Habitat use of the introduced cane toad (*Rhinella marina*) and native frog species in tropical Australia. Journal of Tropical Ecology 31, 531–540.

Medical Entomology Unit. (2017). Medical Entomology Unit Annual Report 2016/2017. Northern Territory Government, Darwin NT.

Morris, K., Woinarski, J., Friend, T., Foulkes, J., Kerle, A. & Ellis, M. (2016). *Trichosurus vulpecula. The IUCN Red List of Threatened Species 2016: e.T40585A21952080.* https://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T40585A21952080.en. [Accessed 14 March 2022]

OEH (2021) How to identify a Cane Toad. Office of Environment and Heritage. Available at https://www.environment.nsw.gov.au/topics/animals-and-plants/pest-animals-and-weeds/pest-animals/cane-toads/how-to-identify-a-cane-toad (accessed 14-6-21).

O'Shea, M., Allison, A., Tallowin, O., Wilson, S. and Melville, J. (2014). Chlamydosaurus kingii, Frilled Lizard. *IUCN Red List of Threatened Species*. doi:https://doi.org/10.2305/iucn.uk.2017-3.rlts.t170384a21644690.en.

Pettit, L., Crowther, M.S., Ward-Fear, G. and Shine, R. (2021). Divergent long-term impacts of lethally toxic cane toads (Rhinella marina) on two species of apex predators (monitor lizards, Varanus spp.). *PLOS ONE*, 16(7), p.e0254032. doi:https://doi.org/10.1371/journal.pone.0254032.

Price-Rees, SJ, Brown, GP & Shine, R 2010, 'Predation on toxic cane toads (Bufo marinus) may imperil bluetongue lizards (*Tiliqua scincoides intermedia*, Scincidae) in tropical Australia', *Wildlife Research*, vol. 37, no. 2, p. 166.

Schroeder, T., Lewis, M.M. Kilpatrick, A.D., and Moseby, K.E. (2015) Dingo interactions with exotic macropredators: spatiotemporal dynamics in an Australian arid-zone study. Wildlife Research 42(6) 529-539.

SLR (2018). East Point Reserve biodiverity management plan (2019 – 2024). Report prepared for City of Darwin.

Smith, B. (2015). *The Dingo Debate*. CSIRO PUBLISHING.

Smith JG & Phillips BL (2006) Toxic tucker: the potential impact of Cane Toads on Australian reptiles. Pacific Conservation Biology 12, 40–49.

Stirrat, S. (2000). The ecology and management of the Agile Wallaby, *Macropus agilis*. PhD thesis, Northern Territory University, Darwin NT.

Stobo-Wilson A., Murphy B., & Cremona T. (2019). Contrasting patterns of decline in two arboreal marsupials from Northern Australia. *Biodiversity Conservation* 28(11), pp. 2951-2965.

Stobo-Wilson, A., Stokeld, D., Einoder, L., Davies, H., Fisher, A., Hill, B., Mahney, T., Murphy, B., Stevens, A., Woinarski, J. and Rangers, B. (2020). Habitat structural complexity explains patterns of feral cat and dingo occurrence in monsoonal Australia. Diversity and Distributions, 26(7), pp. 832-842.

Swanson, S. (2007). Field guide to Australian reptiles. *Steve Parish Publishing*. Archerfield, Qld.

Threatened Species Scientific Committee (TSSC). (2021). Conservation Advice *Trichosurus vulpecula arnhemensis* Northern Brushtail Possum. Canberra: Department of Agriculture, Water and the Environment. [online] Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/83091-conservation-advice-11052021.pdf.

Ujvari B, Mun H-C, Conigrave AD, Bray A, Osterkamp J, Halling P & Madsen T (2013) Isolation breeds naivety: island living robs Australian varanid lizards of toad-toxin immunity via four-base-pair mutation. Evolution 67, 289–294.

Weed Management Branch (2021). Weed Management Handbook. Accessed October chrome-extension://bdfcnmeidppjeaggnmidamkiddifkdib/viewer.html?file=https://nt.gov.au/__data/assets/pdf_file/0004/233833/nt-weed-management-handbook.pdf

Wilson SK & Knowles DG (1988) Australia's Reptiles: A Photographic Reference to the Terrestrial Reptiles of Australia. Collins Publishers.

Wilson S & Swan G (2021) A Complete Guide to Reptiles of Australia. 6th edition. Reed New Holland Publishers.

APPENDIX A LEGISLATIVE AND REGULATORY CONTEXT

The table below provides an overview of the key Commonwealth and NT environmental and heritage legislation applicable to the management of the reserves.

Legislation and regulations	Relevance to project
Commonwealth	
Environment Protection and Biodiversity Conservation (EPBC) Act 1999	The EPBC Act is the Australian Government's key environmental legislation. Approval under the Act may be required for any proposed action likely to have a significant impact on a matter protected by that Act. The environment assessment and approvals process of the Act aims to protect Matters of National Environmental Significance (MNES), as well as the environment in general where actions proposed are on, or will affect Commonwealth land, and/or where Commonwealth agencies are proposing to take an action. The Act is administered by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW). Changes in land use or land management actions that impact on MNES may require assessment and approval under the Act. MNES known or with potential to occur within the reserve include: Northern Blue-tongued Lizard, Mitchell's Water Monitor, Northern Brushtail and migratory shorebird species (some listed as threatened under the EPBC Act).
Nature Repair Act 2023	The Act establishes the framework for a national, voluntary biodiversity market where private finance can be utilised for a broad range of activities that protect and rehabilitate natural environments. The framework will establish tradeable biodiversity certificates for each 'project' that can be sold to buyers under a commercial contract. Regular reporting must be done to describe and verify genuine biodiversity outcomes and how they comply with biodiversity integrity standards under the Act. Certificates, their status and ownership will be trackable via a public register. Further information on the Nature Repair Act and market can be found online: https://www.dcceew.gov.au/environment/environmental-markets/nature-repair-market.
NT	
Planning Act	The Act regulates the use and development of land in the NT and sets out procedures for making development applications. Under the Act, the clearance and maintenance of fire breaks are exempt from requiring a permit to clear native flora.
Territory Parks and Wildlife Conservation (TPWC) Act	Applies statutory obligations in relation to the protection of flora and fauna. This Act allows the listing of threatened species with special conservation status, and requires a permit to be obtained prior to interference with these species. Of relevance to Council activities, is that a permit must be obtained under the Act to clear native vegetation or take or interfere with protected wildlife. Offences under the Act include: • Either directly or indirectly alter, damage or destroy an area or part of an area of essential habitat unless the person is authorised to do so. • Undertake actions that significantly impact on essential habitat. • Clear native flora without appropriate approval. • Take or interfere with protected wildlife unless the person is authorised to do so. • Undertake actions that significantly impact a vulnerable or endangered species. • Release a feral animal in the NT.
Waste Management and Pollution Control Act	This Act provides for the protection of the environment by encouraging effective waste management, and pollution prevention and control practices. The Act establishes which activities require environmental protection approvals or licences, and also established environmental nuisances as an offence.

Water Act	Provides for the investigation, allocation, use, control, protection, and management of surface water and groundwater resources, as well as the administrative process for licensing these activities.
Weeds Management Act	The purpose of the Act is to prevent the spread of weeds into and out of the NT. Under the Act, owners and occupiers of land are responsible for weed management and have a general duty to control weeds. Controlling weeds is central to protecting both native vegetation and fauna species. The Act declares certain plants to be weeds, classifies weeds according to management requirements, and places obligations on land owners and occupiers to manage weeds. Desktop and field assessments have identified listed weeds within the reserve (EcOz 2021). Control of weeds by Council and leaseholders is required to ensure compliance with this Act.
Bushfires Management Act	The Act provides the framework for managing bushfire in areas outside the Emergency Response Area of cities and towns in the NT.
Fire and Emergency Regulations	The Regulations present the requirements for firebreaks. The firebreak must be a minimum of four metres wide and graded or slashed to a max height of 50 mm or, lawn or cultivated garden. Landowners or occupiers are responsible for installing and maintaining clear firebreaks on their property.
Northern Territory Planning Scheme	The Planning Scheme is a statutory document that sets out the rules and guidelines for land use planning and development. The planning zones and overlays in the Planning Scheme provide the specific controls for use and development of the land, including permitted and non-permitted uses.
NT Land Clearing Guidelines	These guidelines provide technical advice for planning and undertaking land clearing in the NT. The guidelines are formally recognised under the Planning Act. The guidelines outline practices to avoid or minimise adverse environmental impacts from clearing, and requirements for considering threatened species, significant vegetation and other environmental matters.
Australian Standard (AS) 4373 – Pruning of Amenity Trees	This standard has been set for arborists, tree maintenance contractors and local government officers to bring uniformity to the industry through application of sound arboricultural techniques. This standard promotes retaining the structural appearance and habit of trees to protect potential fauna habitat and the overall health of tree species. Council employees and contractors must consider undertaking pruning in accordance with this standard to ensure best practice.
Native Vegetation Policy	The City of Darwin's Native Vegetation Policy (2022) – this guides the management and protection of native vegetation on Council managed land.
Animal Management Policy	The City of Darwin's Animal Management Policy (2023). The purpose of the policy is to provide a proactive, responsive, evolving approach to animal management that is consistent with Council's Dog and Cat Management.

EcOz Environmental Consultants

APPENDIX B FAUNA SPECIES RECORDS – FIELD & DESKTOP SURVEYS 2013, 2016 &2023

Scientific Name	Common Name	EcOz (2013)	DLRM (2016)	EcOz (2023)
Amphibians				
Limnodynastes convexiusculus	Marbled Frog	x		
Litoria caerulea	Green Tree Frog	x	x	
Litoria nasuta	Rocket Frog	x		
Litoria ridibunda	Western Laughing Tree Frog			x
Rhinella marina	Cane Toad		x	x
	Frog sp.			x
Birds				
Accipiter cirrocephalus	Collared Sparrowhawk		x	x
Accipiter fasciatus	Brown Goshawk	x	x	x
Accipter novaehollandiae	Grey Goshawk	x		
Acrocephalus australis	Australian Reed-warbler	x		
Actitis hypoleucos	**Common Sandpiper**		**x**	**x**
Aegotheles cristatus	Australian Owlet-nightjar	x		
Anhinga novaehollandiae	Australasian Darter		x	
Anseranas semipalmata	Magpie Goose		x	
Anthus novaeseelandiae	Australasian Pipit		x	
Aprosmictus erythropterus	Red-winged Parrot		x	
Apus pacificus	Fork-tailed Swift		x	
Ardea ibis	Cattle Egret		x	
Ardea intermedia	Intermediate Egret		x	
Ardea modesta	Eastern Great Egret		x	
Ardea pacifica	White-necked Heron	x		
Ardea sumatrana	Great-billed Heron	x		
Ardenna pacifica	Wedge-tailed Shearwater	x		
Arenaria interpres	**Ruddy Turnstone**		**x**	**x**
Artamus cinereus	Black-faced Woodswallow			x
Artamus leucorynchus	White-breasted Woodswallow		x	x
Artamus personatus	Masked Woodswallow		x	
Aviceda subcristata	Pacific Baza	x	x	x
Burhinus grallarius	Bush Stone-curlew		x	x
Butorides striata	Striated Heron		x	x
Cacatua galerita	Sulphur-crested Cockatoo		x	x
Cacatua sanguinea	Little Corella		x	x
Cacomantis variolosus	Brush Cuckoo	x	x	
Calidris acuminata	**Sharp-tailed Sandpiper**			**x**
Calidris alba	**Sanderling**		**x**	**x**

Scientific Name	Common Name	EcOz (2013)	DLRM (2016)	EcOz (2023)
Calidris canutus	**Red Knot**		**x**	**x**
Calidris ferruginea	**Curlew Sandpiper**		**x**	**x**
Calidris melanotos	Pectoral Sandpiper		x	
Calidris ruficollis	**Red-necked Stint**		**x**	**x**
Calidris tenuirostris	**Great Knot**		**x**	**x**
Calyptorhynchus banksii macrorhynchus	Red-tailed Black-cockatoo (Top End)		x	x
Caprimulgus macrurus	Large-tailed Nightjar	x	x	x
Centropus phasianinus	Pheasant Coucal		x	
Ceyx azureus	Azure Kingfisher		x	
Chalcites basalis	Horsfield's Bronze-Cuckoo		x	
Chalcites minutillus	Little Bronze-Cuckoo	x	x	x
Chalcophaps longirostris	Pacific Emerald Dove		x	x
Charadrius leschenaultii	**Greater Sand Plover**		**x**	**x**
Charadrius mongolus	**Lesser Sand Plover**		**x**	**x**
Charadrius ruficapillus	Red-capped Plover		x	
Charadrius veredus	**Oriental Plover**		**x**	**x**
Chlidonias hybrida	Whiskered Tern		x	
Chlidonias leucopterus	White-winged Black Tern		x	
Chroicocephalus novaehollandiae	Silver Gull		x	x
Cissomela pectoralis	Banded Honeyeater		x	
Cisticola exilis	Golden-headed Cisticola		x	
Cisticola juncidis	Zitting Cisticola		x	
Colluricincla harmonica	Grey Shrike-thrush		x	
Colluricincla megarhyncha	Little Shrike-thrush	x	x	x
Columba livia	Rock Dove		x	
Conopophila albogularis	Rufous-banded Honeyeater	x	x	x
Conopophila rufogularis	Rufous-throated Honeyeater		x	
Coracina novaehollandiae	Black-faced Cuckoo-shrike	x	x	x
Coracina papuensis	White-bellied Cuckoo-shrike	x	x	
Coracina tenuirostris	Cicadabird	x	x	x
Corvus orru	Torresian Crow		x	x
Cracticus nigrogularis	Pied Butcherbird		x	
Cracticus quoyi	Black Butcherbird		x	x
Cracticus torquatus	Grey Butcherbird	x		
Cuculus optatus	Oriental Cuckoo		x	
Dacelo leachii	Blue-winged Kookaburra		x	
Dendrocygna arcuata	Wandering Whistling-duck	x		
Dicaeum hirundinaceum	Mistletoebird		x	x
Dicrurus bracteatus	Spangled Drongo	x	x	x
Ducula bicolor	Pied Imperial-Pigeon		x	x

Scientific Name	Common Name	EcOz (2013)	DLRM (2016)	EcOz (2023)
Egretta garzetta	Little Egret		x	x
Egretta novaehollandiae	White-faced Heron		x	
Egretta picata	Pied Heron		x	
Egretta sacra	Eastern Reef Egret		x	
Entomyzon cyanotis	Blue-faced Honeyeater		x	x
Eolophus roseicapilla	Galah		x	x
Ephippiorhynchus asiaticus	Black-necked Stork		x	
Erythrura gouldiae	Gouldian Finch	x		
Esacus magnirostris	Beach Stone-curlew		x	x
Eudynamys orientalis	Eastern Koel	x	x	x
Eurostopodus argus	Spotted Nightjar			
Eurystomus orientalis	Dollarbird	x	x	
Falco berigora	Brown Falcon		x	
Falco cenchroides	Nankeen Kestrel		x	
Falco longipennis	Australian Hobby		x	
Fregata andrewsi	Christmas Island Frigatebird		x	
Fregata ariel	Lesser Frigatebird		x	
Fregata minor	Great Frigatebird	x		
Gallinago megala	Swinhoe's Snipe		x	
Gallirallus philippensis	Buff-banded Rail		x	
Gelochelidon nilotica	Gull-billed Tern		x	
Geopelia cuneata	Diamond Dove		x	
Geopelia humeralis	Bar-shouldered Dove	x	x	x
Geopelia striata	Peaceful Dove	x	x	x
Gerygone albogularis	White-throated Gerygone		x	
Gerygone chloronota	Green-backed Gerygone		x	x
Gerygone levigaster	Mangrove Gerygone		x	x
Gerygone magnirostris	Large-billed Gerygone	x	x	x
Glareola maldivarum	**Oriental Pratincole**			**x**
Grallina cyanoleuca	Magpie-lark	x	x	x
Haematopus fuliginosus	Sooty Oystercatcher		x	
Haematopus longirostris	Australian Pied Oystercatcher		x	x
Haliaeetus leucogaster	White-bellied Sea-eagle		x	
Haliastur indus	Brahminy Kite		x	x
Haliastur sphenurus	Whistling Kite		x	x
Himantopus himantopus	Black-winged Stilt		x	
Hirundo neoxena	Welcome Swallow		x	
Hirundo rustica	Barn Swallow		x	
Hydroprogne caspia	Caspian Tern		x	
Lalage leucomela	Varied Triller	x	x	x
Lalage sueurii	White-winged Triller		x	

Scientific Name	Common Name	EcOz (2013)	DLRM (2016)	EcOz (2023)
Lichenostomus keartlandi	Grey-headed Honeyeater		x	
Lichenostomus flavescens	Yellow-tinted honeyeater			x
Lichenostomus unicolor	White-gaped Honeyeater	x	x	x
Lichenostomus virescens	Singing Honeyeater		x	
Lichmera indistincta	Brown Honeyeater	x	x	x
Limicola falcinellus	Broad-billed Sandpiper		x	
Limnodromus semipalmatus	Asian Dowitcher		x	
Limosa lapponica	**Bar-tailed Godwit**		**x**	**x**
Limosa limosa	**Black-tailed Godwit**		**x**	**x**
Lonchura castaneothorax	Chestnut-breasted Mannikin		x	
Lonchura flaviprymna	Yellow-rumped Mannikin		x	
Lophoictinia isura	Square-tailed Kite		x	
Malurus melanocephalus	Red-backed Fairy-wren		x	
Manorina flavigula	Yellow-throated Miner		x	
Megalurus timoriensis	Tawny Grassbird		x	
Megapodius reinwardt	Orange-footed Scrubfowl	x	x	x
Melithreptus albogularis	White-throated Honeyeater		x	x
Merops ornatus	Rainbow Bee-eater	x	x	x
Microcarbo melanoleucos	Little Pied Cormorant		x	
Microeca flavigaster	Lemon-bellied Flycatcher	x	x	x
Milvus migrans	Black Kite		x	x
Myiagra alecto	Shining Flycatcher	x	x	x
Myiagra inquieta	Restless Flycatcher		x	
Myiagra rubecula	Leaden Flycatcher		x	
Myiagra ruficollis	Broad-billed Flycatcher		x	x
Myzomela erythrocephala	Red-headed Honeyeater	x	x	x
Myzomela obscura	Dusky Honeyeater	x	x	
Neochmia phaeton	Crimson Finch		x	
Nettapus pulchellus	Green Pygmy-goose	x		
Ninox connivens	Barking Owl		x	
Ninox novaeseelandiae	Southern Boobook	x		x
Ninox rufa	Rufous Owl		x	
Numenius madagascariensis	**Eastern Curlew**		**x**	**x**
Numenius minutus	Little Curlew		x	
Numenius phaeopus	**Whimbrel**		**x**	**x**
Nycticorax caledonicus	Nankeen Night Heron		x	
Nymphicus hollandicus	Cockatiel	x		
Onychoprion anaethetus	Bridled Tern		x	
Oriolus flavocinctus	Yellow Oriole	x	x	x
Oriolus sagittatus	Olive-backed Oriole	x	x	x
Pachycephala lanioides	White-breasted Whistler		x	

Scientific Name	Common Name	EcOz (2013)	DLRM (2016)	EcOz (2023)
Pachycephala melanura	Mangrove Golden Whistler		x	
Pachycephala rufiventris	Rufous Whistler	x		
Pachycephala simplex	Grey Whistler	x	x	x
Pandion cristatus	Eastern Osprey		x	
Pardalotus striatus	Striated Pardalote	x	x	x
Pelecanus conspicillatus	Australian Pelican		x	
Peneonanthe pulverulenta	Mangrove Robin		x	x
Petrochelidon nigricans	Tree Martin		x	x
Phalacrocorax varius	Pied Cormorant		x	
Phalaropus lobatus	Red-necked Phalarope		x	
Philemon argenticeps	Silver-crowned Friarbird	x	x	
Philemon buceroides	Helmeted Friarbird		x	x
Philemon citreogularis	Little Friarbird		x	x
Pitta iris	Rainbow Pitta	x	x	x
Platalea regia	Royal Spoonbill		x	
Plegadis falcinellus	Glossy Ibis	x		
Pluvialis fulva	**Pacific Golden Plover**		**x**	**x**
Pluvialis squatarola	Grey Plover		x	
Podargus strigoides	Tawny Frogmouth	x	x	x
Poephila acuticauda	Long-tailed Finch		x	
Poephila personata	Masked Finch		x	
Pomatostomus temporalis	Grey-crowned Babbler	x		
Psitteuteles versicolor	Varied Lorikeet		x	
Ptilinopus regina	Rose-crowned Fruit-dove		x	x
Ptilonorhynchus nuchalis	Great Bowerbird		x	
Ramsayornis fasciatus	Bar-breasted Honeyeater		x	
Rhipidura albiscapa	Grey Fantail		x	
Rhipidura dryas	Arafura Fantail	x	x	x
Rhipidura leucophrys	Willie Wagtail		x	
Rhipidura phasiana	Mangrove Grey Fantail		x	
Rhipidura rufiventris	Northern Fantail	x	x	x
Scythrops novaehollandiae	Channel-billed Cuckoo		x	
Smicrornis brevirostris	Weebill	x		
Sphecotheres vieilloti	Australasian Figbird	x	x	x
Sterna dougallii	Roseate Tern		x	
Sterna hirundo	Common Tern		x	
Sterna sumatrana	Black-naped Tern	x		
Sternula albifrons	Little Tern		x	
Stiltia isabella	Australian Pratincole	x		
Sula leucogaster	Brown Booby		x	
Tachybaptus novaehollandiae	Australasian Grebe	x		

Scientific Name	Common Name	EcOz (2013)	DLRM (2016)	EcOz (2023)
Tadorna radjah	Radjah Shelduck		x	x
Taeniopygia bichenovii	Double-barred Finch		x	x
Thalasseus bengalensis	Lesser Crested Tern		x	
Thalasseus bergii	Crested Tern		x	
Threskiornis molucca	Australian White Ibis		x	x
Threskiornis spinicollis	Straw-necked Ibis		x	x
Todiramphus chloris	Collared Kingfisher		x	x
Todiramphus macleayii	Forest Kingfisher	x	x	x
Todiramphus pyrrhopygius	Red-backed Kingfisher		x	
Todiramphus sanctus	Sacred Kingfisher	x	x	x
Trichoglossus h. rubritorquis	Red-collared Lorikeet		x	x
Tringa brevipes	**Grey-tailed Tattler**		**x**	**x**
Tringa glareola	Wood Sandpiper		x	
Tringa incana	Wandering Tattler		x	
Tringa nebularia	**Common Greenshank**		**x**	**x**
Tringa stagnatilis	**Marsh Sandpiper**		**x**	**x**
Tyto longimembris	Eastern Grass Owl	x		
Vanellus miles	Masked Lapwing		x	x
Xenus cinereus	**Terek Sandpiper**		**x**	**x**
Zosterops luteus	Yellow White-eye	x	x	
Mammals				
Canis familiaris dingo	Dingo	x		x
Chaerephon jobensis	Greater Northern Free-tailed Bat			x
Chalinolobus gouldii	Gould's Wattled Bat	x		
Felis catus	Cat	x		
Isodon macrourus	Northern Brown Bandicoot	x		x
Macroglossus minimus	Northern Blossom Bat		x	
Macropus agilis	Agile Wallaby	x	x	x
Melomys burtoni	Grassland Melomys	x		x
Miniopterus orianae orianae	Northern Bent-winged Bat			x
Nyctophilus arnhemensis	Arnhem Long-eared Bat			x
Ozimops cobourgianus	Northern Coastal free-tailed Bat			x
Pipistrellus adamsi	Forest Pipistrelle			x
Pipistrellus westralis	Northern Pipistrelle			x
Pteropus alecto	Black Flying-fox	x		x
Pteropus scapulatus	Little Red Flying-fox	x		
Rattus colletti	Dusky Rat		x	
Saccolaimus flaviventris	Yellow-bellied Sheath-tailed Bat			x
Taphozous georgianus	Common Sheath-tailed Bat			x
Trichosurus vulpecula arnhemensis	**Northern Brushtail Possum (Top End)**		**x**	**x**

Scientific Name	Common Name	EcOz (2013)	DLRM (2016)	EcOz (2023)
Vespadelus caurinus	Northern Cave Bat			x
Ambiguous identifications				
Chalinolobus nigrogriseus and/or *Scotorepens greyii* and/or *Scotorepens sanborni*	Hoary Wattle Bat and/or Little Broad-nosed Bat and/or Northern Broad-nosed Bat			x
Reptiles				
Antaresia childreni	Children's Python		x	
Boiga irregularis	Brown Tree Snake		x	x
Carlia gracilis	Slender Rainbow Skink	x	x	x
Carlia rufilatus	Red-Sided Rainbow Skink		x	
Carlia sexdentata	Six-toothed Rainbow Skink			x
Cerberus australis	Australian Bockadam		x	
Chlamydosaurus kingii	Frilled-neck Lizard	x	x	
Cryptoblepharus cygnatus	Swanson's Snake-Eyed Skink		x	
Ctenotus spaldingi	Spalding's Ctenotus		x	
Demansia olivacea	Olive Whip Snake		x	
Dendrelaphis punctulata	Green Tree Snake	x	x	
Eremiascincus douglasi	Orange-sided Bar-lipped Skink	x	x	x
Fordonia leucobalia	White-bellied Mangrove Snake			x
Furina ornata	Orange-naped Snake		x	
Gehyra australis	Northern Dtella		x	
Glaphyromorphus darwiniensis	Top End Mulch-skink		x	x
*Hemidactylus frenatus**	Asian House Gecko	x		x
Heteronotia binoei	Bynoe's Gecko	x	x	x
Indotyphlops braminus	Flower-pot Blind Snake			x
Liasis mackloti	Water Python		x	
Morelia spilota	Carpet Python	x	x	x
Pseudonaja nuchalis	Western Brown Snake		x	
Stegonotus cucullatus	Slaty-grey Snake		x	x
Tiliqua scincoides intermedia	**Northern Blue-Tongued Skink**		**x**	
Tropidonophis mairii	Keelback		x	
Tropicagama temporalis	Swamplands Lashtail	x		x
Varanus panoptes	**Yellow-spotted Monitor**		**x**	**x**
Varanus scalaris	Spotted Tree Monitor		x	
Vermicella intermedia	Northern Bandy-bandy	x		
Vermicella multifasciata	Narrow-banded Northern Bandy-bandy		x	

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APPENDIX C WEED CONTROL TECHNIQUES

There are a number of weed control techniques, each of which has specific advantages and disadvantages. The method of weed control chosen will be dependent on the type of weed, level of infestation and its location, among other factors. The two main treatment methods utilised at the reserve include physical (i.e. hand pulling, mowing, mulching etc.) and chemical (i.e. foliar spray, direct application).

In general, chemical control will be utilised at the reserve and supplemented by alternative treatment methods as required. The two methods of herbicide application are application by foliar spraying and direct application. Foliar spraying applies herbicide diluted with water onto targeted foliage, allowing the leaves to directly absorb the active ingredients. Direct application uses a wiper or paintbrush for applying herbicide (usually the cut stump method).

When choosing the method of application, consideration should be given to the species of weed being managed as well as the surrounding environment. Foliar spraying can be carried out in a number of different ways depending on the size of the infestation. Foliar spraying is considered an efficient and cost-effective method for weed control; however, risks associated with spraying include potential spray drift and damage to native plants (WMB, 2015). It is important to undertake herbicide application in calm or low wind conditions to prevent potential drift. Works must be undertaken by an appropriately qualified person with the ability to accurately distinguish the relevant weed species from native species. It is also important that follow-up treatment is carried out (approximately one month post the initial application) to control seedling recruitment and regrowth after the site has been treated.

A person who uses a chemical product has a duty of care to ensure the use does not result in harm to the health of the general public, animals, the environment or domestic or export trade in agricultural produce. The Australian Pesticides and Veterinary Medicines Authority (APVMA) registers pesticides and herbicides for use in Australian States and Territories according to the provisions of the *Agricultural and Veterinary Chemicals (Northern Territory) Act*. Herbicides must be used according to the directions for use on the APVMA registered label (WMB, 2021).

Weed treatment for each species should be timed according to the growing season, and treatment should generally occur following germination when the plant is actively growing. Treatment should also occur prior to the plant flowering to ensure treatment occurs before the plant has an opportunity to seed, thus preventing seed dispersal. The areas controlled with chemical use must be revisited to assess if further herbicide application is required for complete success. The secondary treatment can occur approximately one month following the initial treatment, to allow the initial effect of the herbicide to take place and assess regrowth and/or missed areas. Plant seeds may remain viable in the ground for a number of years. It is therefore critical that monitoring be undertaken over the long-term. Photo monitoring is a useful form of monitoring.

The weed control methods being successfully implemented at the reserve are presented in the table below. Where other controls are required, they should be determined with reference to the weed control option tables provided in the *Northern Territory Weed Management Handbook* which include prescribed treatment methods, chemical application methods and application rates, and suitable timing for each species (WMB 2021).

In addition to weed management conducted by the City of Darwin, the reserve incorporates areas managed by lessees (including the Fannie Bay Equestrian Club, the Darwin Aero Modellers Club and Pee Wee's at the Point) and the Commonwealth owned Darwin Military Museum. The managers of these properties are required to manage weeds both by the lease conditions and their obligations under the WM Act.

Table of current weed control methods

Source: City of Darwin (supplied) and Lewis 2010

Weed	Control method
Medium to large trees	
Neem (*Azadirachta indica*), African Mahogany (*Khaya senegalensis*), Grewia (*Grewia asiatica*), Siamese Cassia (*Senna siamea*), African Tulip (*Spathodea campanulata*), White Beach (*Melia* spp.) and Golden Shower (*Cassia fistula*)	Plants occurring in areas where members of the public rarely frequent, and therefore the risk of injury due to falling branches is negligible, will be treated with a basal bark application and be allowed to die in situ. Plants occurring where the risk of falling branches is higher will be treated by the cut stump method.
Herbaceous shrubs	
Barleria (*Barleria prionitis*), Creeping Sensitive Plant (*Mimosa diplotricha*), Sicklepod (*Senna obtusifolia*), Spinyhead Sida (*Sida acuta*), Snakeweeds *Stachytarpheta sp.)*, Hyptis (*Hyptis suaveolens*), Lions Tail (*Leonotis nepetifolia*), Yellow Oleander (*Cascabela thevetia*), Berrimah Weed (*Mitracarpus hirtus*), Cobblers Peg (*Bidens pilosa*)	Foliage treated with either Starane or Kamba M, or hand pulled.
Vines	
Calopo (*Calopogonium mucunoides*), Centro (*Centrosema molle*), Morning Glory (*Ipomoea* sp), Phasey Bean (*Macroptilium lathyroides*), Wild Passion Fruit (*Passiflora foetida*)	Foliar spray with Starane or hand pulling.
Grassy weeds	
Gamba Grass (*Andropogon gayanus*), Purple Top Chloris (*Chloris inflata*), Mission Grass (*Cenchrus polystachios*), and Mossman River Grass (*Cenchrus echinatus*)	A combination of slashing to prevent seed set and spot spraying with glyphosate will be used to combat these weeds in the grassed areas.
Herbaceous weeds in grasslands	
-	Herbaceous weeds in grasslands are an emerging issue at the reserve. Boom spraying using appropriate herbicides will be trialled. Reseeding of grasses may be required.
Species specific controls	
Bellyache Bush (*Jatropha gossypiifolia*)	Periodic hand weeding and foliar spraying with Starane twice annually, once at the beginning of the wet season and once at the end.
Chinee apple (*Ziziphus mauritiana*)	Cut and poisoning of the stump.
Lantana (*Lantana camara*)	Periodic hand weeding and foliar spraying with glyphosate 360 twice annually, once at the beginning of the wet season and once at the end.
Coffee Bush (*Leucaena leucocephala*)	Small plants are hand pulled, adults sprayed with glyphosate, basal bark treatment with diesel and access at a rate of 60:1, or cut and poisoning of the stump.

Weed	Control method
Poinciana (*Delonix regia)*	Plants in open space where the heavy seed poses little or no threat of spreading into remnant vegetation areas will be retained. Poincianas invading the remnant bushland on the northern and eastern sides of Alec Fong Lim Drive will be removed. Trees posing no threat to pedestrians or vehicles will be basal bark treated and left to die in-situ. Trees that cannot be left standing once killed will be removed and the stumps poisoned to prevent regrowth. Trees growing on the western side of Alec Fong Lim drive whose branches are hanging over the road will be pruned to prevent seed falling onto the opposite side of the road and reinfesting the monsoon forest.

APPENDIX D FIRE MANAGEMENT SITE ASSESSMENT

Methodology

A field visit of East Point reserve was undertaken on 26 April by EcOz Botanist, Nicole Clark, with guidance and oversight by EcOz ecological fire management specialist, Toby Barton, to assess the Council's management of the reserve and ensure its compliance with the *Bushfire Management Act 2016.*

The perimeter of the reserve was traversed via push bike and walking (in some instances the perimeter was inaccessible, so the path closest to the perimeter was traversed), and the following attributes were recorded:

- Fire breaks around the perimeter of the reserve – minimum of 4m and sufficiently clear of vegetation. Additional waypoints were obtained if maintenance was required i.e. removal of vegetation, removal of garden waste i.e. grass (lawn clippings) and piles of fronds removed, weed control or extension of fire break.
- Location of infrastructure or flammable material.
- Location of management gates and associated condition – i.e. good - indicating no management issues, moderate - indicating some management required (i.e. vegetation clearing), and poor – indicating the padlock was rusted or corroded; thus requires lock replacement.
- Location of where access is required i.e. recommend where firebreak needs to be installed manually.
- Fire must be excluded from the monsoon forest and the wetter communities such as the mangroves provide a fire refuge. Grassland surrounding the monsoon forest and woodland within the 'Breezeway' are vulnerable to fire. Management of the reserve must balance fire management and risk to ecological values and surrounding residential development.

Results

Overall findings

- Overall, there was a clear path (firebreak) around the perimeter of the reserve, except the north-eastern corner – due to the presence of mangrove vegetation. The main risks were overgrown vegetation along fence lines, moderate to high density patches of grassy weeds (mostly Mission Grass) present adjacent to dwellings and locked gates with outdated padlocks.
- Firebreaks within the reserve are separated into sections, i.e. from the mangroves to the coast, will be most effective in a fire suppression scenario. In total, there are six management areas that will need to be considered. Smaller management areas will assist in compartmentalising fuel loads and if an emergency backburn must be done. It will also help reduce the amount of area potentially burnt.
- Three access gates were in poor condition and require new padlocks, and vegetation clearing to allow access during an emergency.
- Nine gates were in moderate condition, indicating vegetation clearing is required.
- All remaining gates were in good condition, with no management issues recorded.
- All gates were locked at the time of survey, except for the main entrance gates. Access needs to be assured in an emergency through management of gates.

Note - Numbers are provided for site features/ observations (e.g. Gate # 2) as identified on Figure 5-4**.**

Management Area 1. Southern boundary

- 750 m of firebreak requires maintenance including clearing piles of green waste (mostly dried palm fronds and grass clippings) adjacent to houses, and the removal of grassy weeds, occasionally present in moderate to dense patches along property fence lines. This is a priority given their proximity to houses. Presence of grassy weeds also increases fire risk in this area.
- 275 m firebreak requires maintenance including widening to 4 m corridor to allow vehicle access in an emergency. Currently the firebreak clearance is 2 – 3 m and ATV access is recommended. Piles of green waste, and overgrown vegetation were also observed along this path.
- There were three access gates in this area. Gate #2 was locked at the time of survey, was in good condition providing direct access to East Point Road. Gate #20 was locked at the time of survey and was in poor condition. It requires a new lock and vegetation removed surrounding gate. Gate # 11 located at the eastern end of this firebreak, was locked at the time of survey and was in moderate condition and requires vegetation removal .
- One 50 m fire break needs to be installed manually perpendicular of East Point Road to ensure these breaks are adjoining the coast.

Management Area 2. East Point Road/ Colivas Road

- 800 m firebreak was in good condition along East Point Road with a clear, open access path. Ongoing firebreak maintenance required.
- 1.8 km firebreak surrounding Lake Alexander requires some maintenance including vegetation removal.
- There are six access gates in this section. Two gates (1 & 7) were in good condition, while three gates (10, 14 & 2) were in moderate condition requiring vegetation clearing, and Gate # 5 was in poor condition, requiring a new padlock.
- One fire break 50 m in length needs to be installed manually; perpendicular along East Point Road to ensure these breaks are adjoining the coast.

Management Area 3. Along Alec Fong Lim Drive

- Approximately 1 km of firebreak requires maintenance including vegetation removal so that it is cleared to 4 m wide. This fire break is closest to the perimeter of the reserve represented by the aqua path (Figure 5-4). Alternatively, Alec Fong Lim Road can also be used as a fire break as it exceeds 4 m in width.
- One 50 m firebreaks need to be installed manually perpendicular along Alec Fong Lim Road to ensure these breaks are adjoining the coast.
- Some of the infrastructure located along the boundary (Pee Wee's) requires vegetation clearing around the building. There was also vegetation overhanging two flammable gas canisters secured to the main (restaurant) building.
- There were five access gates in this area. Gate # 9 was located in the south-west corner of the reserve perimeter – it was in moderate condition with some overhanging vegetation and dense leaf litter present on the ground. Gate # 21 is the main entrance gate (along Alec Fong Lim Drive) to the northern section of the reserve and remains open from 5 am – 11 pm daily. It was in good condition with no management issues. Gate # 4 was in moderate condition, with a small amount of overhanging vegetation. Gate # 3 is the main Pee Wee's access gate – it was in good condition with only a few overhanging trees that require trimming.

Management Area 4. East Point west

- Approximately 2.5 km firebreak is in good condition with a clear path. There were a few fenced off areas containing dense patches of weeds (mostly Mission Grass). Fuel reduction techniques should be used in these areas to minimise the risk of fire spreading.
- There were eight gates in this area, only one gate (Gate #15) was associated to the perimeter of the reserve. The remaining gates were associated to site infrastructure and public amenities (i.e. equestrian gate, museum gate, power and water gate and public toilets). All gates, except two (16 &19) were in good condition with no management issues. Gate #16 requires vegetation clearing and Gate #19 requires vegetation clearing and a new padlock.

Management Area 5. Northern Boundary

- Approximately 890 m firebreak is in good condition with a clear path. There was one patch (closer to the western end of northern stretch) containing a patch of dense vegetation (comprised of a pile of dead grass and lawn clippings) occurring around the perimeter of a pumping station). Fuel reduction techniques is required.
- A 50 m firebreak needs to be installed manually perpendicular from the main firebreak to ensure main firebreak is adjoining the coast.
- No access gates were identified in this section.

Management Area 6. Monsoon patch

- Approximately 3.5 km firebreak surrounding the revegetation patches in good condition. Ongoing maintenance required due to high fuel load in the area, and sensitive bushland present.

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7 MEMBER REPORTS

Nil

8 GENERAL BUSINESS

Nil

9 QUESTIONS BY MEMBERS

10 GENERAL BUSINESS

10.1

Common No.

THAT

11 CLOSURE OF MEETING TO THE PUBLIC

THAT pursuant to Section 65 (2) of the Local Government Act and Regulation 8 of the Local Government (Administration) Regulations the meeting be closed to the public to consider the Confidential Items of the Agenda.

RECOMMENDATIONS

That Council considers the confidential report(s) listed below in a meeting closed to the public in accordance with Section 99(2) of the *Local Government Act 2019*:

14.1 Cyclone Tracy Memorial at East Point

This matter is considered to be confidential under Section 99(2) - 51(c)(iv) of the Local Government Act, and the Council is satisfied that discussion of this matter in an open meeting would, on balance, be contrary to the public interest as it deals with information that would, if publicly disclosed, be likely to subject to subregulation 51(3) – prejudice the interests of the council or some other person.

MINUTES

East Point Reserve Advisory Committee Meeting

Thursday, 15 February 2024

MINUTES OF CITY OF DARWIN
EAST POINT RESERVE ADVISORY COMMITTEE MEETING
HELD AT THE MEETING ROOM BIDJPIDJI (MEETING ROOM 1), LEVEL 1, CIVIC CENTRE, HARRY CHAN AVENUE, DARWIN
ON THURSDAY, 15 FEBRUARY 2024 AT 4:30 PM

PRESENT: Chairperson Councillor Mick Palmer
Birdlife NT Lou Martini
Fannie Bay Equestrian Club Anja Zimmermann
Friends of East Point Helen Haritos
Larrakia Nation Ben Smith
Mindil Beach Life Savers NT Noah Marcroft
Museum and Art Gallery of the NT Kirsten Abbott
Community Representative Serena Ragosta
Community Representative Lorraine Corowa
NTG Heritage Branch Samantha Wells

OFFICERS: Nick Fewster (Executive Manager Environment & Waste Services)
Emma Smith (Coordinator Environment and Climate Change)
Elizabeth Gleeson (Environment, Climate and Waste Support Officer)

APOLOGY: Top End Native Plant Society Lon Wallis
Crown Lands NTG Racheal Curtain
Darwin Military Museum Norm Cramp
Darwin Triathlon Club Gary Wall
Pee Wees Restaurant Simon Mathews
Researcher John Rawsthorne

GUESTS: Nil

WEBCASTING DISCLAIMER

The City of Darwin is live webcasting the Open Section of East Point Reserve Advisory Committee Meetings. Audio-visual recording equipment has been configured to avoid coverage of the public gallery area and the City of Darwin will use its best endeavours to ensure images in this area are not webcast. However the City of Darwin expressly provides no assurances to this effect and in the event your image is webcast, you will by remaining in the public gallery area be taken to have given the City of Darwin a non-exclusive licence to copy and broadcast your image worldwide for no reward.

Order Of Business

1 MEETING DECLARED OPEN

RECOMMENDATIONS

THAT the Chair declared the meeting open at 4:30 pm.

2 APOLOGIES AND LEAVE OF ABSENCE

Top End Native Plant Society Lon Wallis

Crown Lands NTG Racheal Curtain

Darwin Military Museum Norm Cramp

Darwin Triathlon Club Gary Wall

Pee Wees Restaurant Simon Mathews

Researcher John Rawsthorne

3 ELECTRONIC MEETING ATTENDANCE

3.1 ELECTRONIC MEETING ATTENDANCE GRANTED

The following members attended the meeting electronically:

- Community Representative Serena Ragosta
- Community Representative Lorraine Corowa
- Friends of East Point Helen Haritos
- Museum and Art Gallery of the NT Kirsten Abbott
- NTG Heritage Branch Samantha Wells

4 DECLARATION OF INTEREST OF MEMBERS AND STAFF

4.1 DECLARATION OF INTEREST BY MEMBERS

Community Representative Lorraine Corowa declared that the views expressed at this committee are her personal views as a community representative and not the views of her senior public servant role within the Northern Territory Government.

4.2 DECLARATION OF INTEREST BY STAFF

Nil

5 CONFIRMATION OF PREVIOUS MINUTES

COMMITTEE RESOLUTION EPRAC001/24

Moved: Birdlife NT Lou Martini
Seconded: Larrakia Nation Ben Smith

THAT the minutes of the East Point Reserve Advisory Committee Meeting held on 5 October 2023 be confirmed.

CARRIED 10/0

6 OFFICER REPORTS

6.1 CITY OF DARWIN EAST POINT UPDATE

COMMITTEE RESOLUTION EPRAC002/24

Moved: Birdlife NT Lou Martini
Seconded: Larrakia Nation Ben Smith

1. THAT a verbal update provided by City of Darwin officers, covering multiple programs and projects, be received and noted.
2. THAT the East Point Advisory Committee recommends that City of Darwin officers consider the following member concerns:
   a) Contact Dan Edwards at MAGNT directly regarding cane toad bust site selection
   b) Contact the CDU representative regarding any CDU cane toad surveys done on-site
   c) Fix holes in cane toad exclusion barrier around the Reserve

CARRIED 10/0

6.2 COMMITTEE MEMBERSHIP REVIEW

COMMITTEE RESOLUTION EPRAC003/24

Moved: Birdlife NT Lou Martini
Seconded: Larrakia Nation Ben Smith

1. THAT the report entitled Committee Membership Review be received and noted.
2. THAT the East Point Advisory Committee recommends that City of Darwin officers compile a report to Council proposing a revised Terms of Reference Membership for approval. **CARRIED 10/0**

7 MEMBER REPORTS

7.1 STAKEHOLDER UPDATES

COMMITTEE RESOLUTION EPRAC004/24

Moved: Birdlife NT Lou Martini
Seconded: Larrakia Nation Ben Smith

1. THAT the report entitled Member Reports, regarding any on-the-ground updates, ideas and concerns relating to site management and decision-making, be received and noted.
2. THAT the East Point Advisory Committee recommends that City of Darwin officers consider the following member concerns:
   a) Damaged sprinklers around the reserve
   b) Mahogany trees on Fannie Bay Equestrian Club site require an arborist assessment
   c) Shared pathway section near PeeWees needs widening
   d) Shared pathway needs increased signage or speed bumps
   e) Remaining section of Monsoon Forest path needs upgrading

.**CARRIED 10/0**

6.2.1

Friends of East Point Helen Haritos noted that the Friends of East Point are having a community planting day Sunday 18 Feb from 8-10am opposite Lake Alexander off Colivas Road.

6.2.2

Community Representative Lorraine Corrowa highlighted the importance of the erosion issue at East Point Reserve and is keen to push for this to be prioritised by Council due to the high community usage of the area.

6.2.3

Fannie Bay Equestrian Club Anja Zimmerman commented that some damaged sprinklers around East Point have been replaced with a more visible structure but some remain and are a public safety concern for people and horses. Anja also mentioned that the mahoganies on site need an arborist assessment. Otherwise, Anya noted that Fannie Bay Equestrian Club have undertaken two toad busts, are going well with their weed management and have some resident goannas. Anja added that the shared pathway section near PeeWees needs widening due to high-use. This was supported by Ben Smith.

6.2.4

Larrakia Nation Ben Smith advised that Larrakia Rangers applied for an NT Ranger Grant to collaborate with Biodiversity Watch on their cane toad taste aversion therapy for goannas but were unsucessful. Larrakia Nation will consider alternative support to undertake this or similar work in East Point.

6.2.5

Community Representative Serena Ragosta raised safety concerns about the speed of cyclists on shared footpaths and requested increased signage or speed bumps to slow them down. This was seconded by Lorraine Corrowa.

6.2.6

Birdlife NT Lou Martini also suggested upgrading the remaining section of the Monsoon Forest path. He noted that the fauna survey used Birdlife Shorebird data and would have been good if Birdlife were acknowledged and consulted.

6.2.7

Museum and Art Gallery of the NT Kirsten Abbott noted in regard to the Dudley Point Fishing Platform that NT Fisheries are commencing a new Land and Sea Compliance Program for Darwin Harbour for the committee's future reference.

8 GENERAL BUSINESS

Nil

9 QUESTIONS BY MEMBERS

RECOMMENDATIONS

Nil

10 GENERAL BUSINESS

RECOMMENDATIONS

Nil

11 CLOSURE OF MEETING

The Chair declared the meeting closed at 4:58pm.

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CHAIR