



Rapid Creek Management Plan

2021 to 2026

Document History

Version	Date	Comments
1	18 May 2021	Prepared by EcOz Environmental Consultants on behalf of the RCWAC
2	21 July 2023	Update of Priority actions (Section 5.1) by the RCWAC, and minor document corrections



Cover photo: Rapid Creek in flow March 2013. Back cover photo: The Spit, September 2017

All photos courtesy of Ian Lancaster

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1 INTRODUCTION

Rapid Creek is a natural drainage system within the confines of the northern suburbs of Darwin in the Top End of the Northern Territory (NT). Rapid Creek extends almost 10 km from its headwaters west of the Marrara Swamp east of the Darwin Airport, draining into the sea at the southern end of Casuarina Beach (Figure 2). Though much of the original vegetation in the catchment has been cleared, there are large patches of remnant vegetation in some areas, and a highly visible green strip of riparian vegetation snaking through the suburbs. It has high amenity value, including a much remarked-on entry statement to Darwin when leaving the airport. Along the creek, there is parkland, walking and cycling tracks along its length, the lower tidal reaches are regularly fished, and in the wet season, the Yankee Pools is used for picnicking. The area is well used.

There are however challenges. Houses have been flooded, the vegetation extent and quality is under threat from urban development, there is fire and weed expansion, and water quality is deleteriously affected by surface and groundwater contamination and alterations to environmental flows.

This combination of high-profile values, coupled with threatening processes, has led to the creation of a number of stakeholder groups. The Rapid Creek Water Advisory Committee (RCWAC) was established by the NT Minister for Environment and Natural Resources to advise the Controller of Water Resources on water quality and water resource management issues affecting Rapid Creek and the Rapid Creek Catchment (RCC) area. The RCWAC's membership is broadly the catchment's key stakeholders; its role is advisory. To manage some issues of the catchment, the Rapid Creek Landcare group (RCLG) was established in 1997. This group aims to protect and restore the catchment through on-ground actions involving the community and raising the profile of the catchment (www.rapidcreek.org.au).

To support the function of the RCWAC, management plans for the catchment are to be prepared and/or reviewed every 5 years. A number of management plans have been prepared for the catchment previously, however, none specifically to support the RCWAC. This plan will replace previous plans, and has been purposefully developed to be overseen by RCWAC.

1.1 Purpose and scope

The scope of this management plan is to:

- Identify the natural assets of the Rapid Creek Catchment
- Describe impacts to these assets
- Identify responsibility for asset/impact management
- Outline management and reporting activities
- Increase management accountability
- Provide a list of priority actions for RCWAC.

1.2 Vision, goals, and objectives

To help guide management planning, the RCWAC has developed the following vision for management of the catchment:

To protect and augment the natural and cultural assets of the Rapid Creek Catchment for the community

To achieve this vision the following goals for this plan have been defined:

- Responsibilities for managing assets and their impacts are clearly defined.
- Plans to manage these impacts are developed by all relevant landholders.
- The values and impacts are better defined.
- That RCWAC oversee and report on landholder's compliance of this plan to the general public through meeting minutes and an annual report to the Controller of Water Resources.

Objectives for this plan are:

- Reduction of in-stream erosion.
- Improvement in vegetation quality.
- No increase in flows into Rapid Creek.
- Improved water quality.

The rest of this plan explains how the objectives are developed to achieve this plan's goals and vision.

1.3 Communication with interested groups

The RCWAC membership represents the catchment's major stakeholders. Minutes from RCWAC meetings are publicly available on the Northern Territory Government (NTG) website on the RCWAC webpage:

<https://denr.nt.gov.au/boards-and-committees/water-advisory-committees/other-advisory-committees/rapid-creek-advisory-committee>

These minutes form an integral part of this management plan, and they will be used to publicly report on compliance with actions outlined in this plan.



Figure 1. Rapid Creek Landcare Group planting at the 'spit'



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ20062 - Rapid Creek PoM\01 Project Files\Figure 1. Map of Rapid Creek.mxd

Figure 2. Map of Rapid Creek catchment and outflow locations

2 CATCHMENT DESCRIPTION

Rapid Creek's catchment has been substantially modified with most of the original vegetation cleared for residential development (Figure 2). There is a large patch of remnant vegetation in the easterly end of the catchment – the Marrara Swamp - and a thin corridor of remnant vegetation along the creek's banks. Riparian vegetation fringes the creek banks for most of its length, in some instances to a width of over 50 metres. In other areas, for example between McMillans Rd and Trower Rd, clearing has reduced this width to just a few trees on either side of the creek (Beagley 2014). The RCLG has undertaken plantings at various locations within the creek corridor, with the aim of improving vegetation quality. Rapid Creek drains into Darwin Harbour at the southern end of Casuarina Beach after flowing through an extensive area of mangroves.

The Marrara Swamp is drained by two separate drainage lines, one on the north-western, and the other on the southwestern side of the swamp. The Marrara Swamp strongly influences Rapid Creek's hydrology by supporting dry season flows as it slowly discharges and attenuating wet season peak flows (Clouston 1994). At the convergence of the two drainage lines into Rapid Creek, a flood mitigation weir exists to reduce the peak discharge and delay floodwaters. A v-notch weir situated within the Jingili Water Gardens was established by the NTG in 1964 by the water resources section, as a flow control weir designed to improve the relationship between river level and flow, but also acts to regulate the flow of saltwater from the tidally influenced lower section into the upper section of the creek.

Water also flows into the creek from multiple piped stormwater drainage systems and open stormwater outfalls (Beagley 2014). Within the Moil drain, there is a gauging station used to monitor water quantity. A large retention basin was installed in 2019 to reduce downstream flooding.

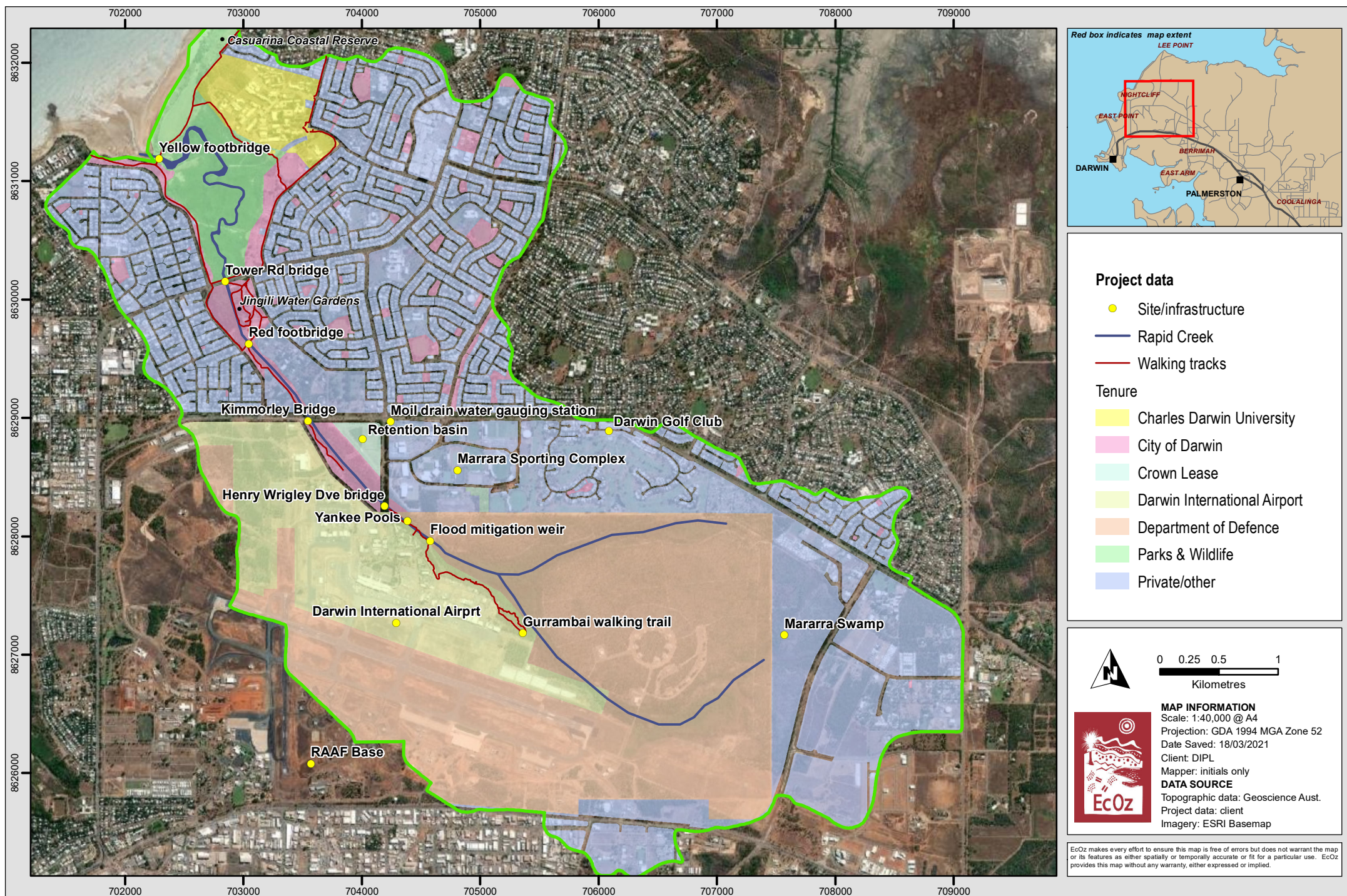
The southern portion of the catchment (upstream of McMillans Road) includes a range of land uses including multipurpose developments, the Marrara Sporting Complex, Darwin Golf Club, and Darwin International Airport (DIA) / RAAF Base Darwin. The northern portion of the catchment (downstream of McMillans Road) comprises a combination of private residences and public land, including the Jingili Water Gardens, a well-used picnic ground with playground, toilets, bbq and a skate park. Along the riverbed, particularly in the western part, are numerous walking and cycling tracks including the Gurumbai Trail managed by DIA.

2.1 Tenure

The Rapid Creek Catchment is predominantly residential blocks, these are mainly in the north-western part of the catchment (Figure 3). Upstream are large areas managed by the Department of Defence (DoD) and Darwin International Airport (DIA).

DoD's land is zoned *Commonwealth land under defence control* and is inaccessible to the public. The section of the creek corridor within DIA's boundary, regulated under the *Airports Act 1996*, is zoned as conservation. These parcels are not subject to NT Planning Scheme controls. Beside the DIA, is the Marrara Sporting Complex, a large area of sporting fields and associated infrastructure.

Downstream from the DIA is CoD freehold land with a thin sliver of conservation zoned land along the creek downstream from McMillans Road. Outside this sliver is freehold land managed by the CoD including the Jingili Water Gardens, this area is flanked by residential blocks. Downstream of Trower Road Bridge the creek corridor is part of the Casuarina Coastal Reserve and is zoned as Conservation. CDU manages the land to the north of the creek's mouth.



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\E220062 - Rapid Creek PoM\01 Project Files\Fig X-X Map of tenure within the Rapid Creek catchment.mxd

Figure 3. Map of tenure within the Rapid Creek catchment

2.2 Water quantity and quality

Rapid Creek's hydrology is strongly seasonal, with large amounts of surface water runoff leading to high flows and flooding in the wet season. Dry season flows are sustained by groundwater from Marrara Wetlands and other groundwater inflows (Beagley 2014).

The replacement of natural vegetation and soil with impermeable surfaces due to development has increased inflows to Rapid Creek. These inflows are also more focused due to runoff now entering the creek via an underground piped drainage system and a series of lined and unlined open stormwater drains (Figure 2).

There have been at least 15 major flood events recorded since 1968. To reduce flooding frequency, a flood control weir and a retention basin have been installed. These devices are designed to delay floodwaters and attenuate peak discharges. Vegetation blocking may exacerbate flooding particularly between the Jingili Water Gardens Footbridge and Trower Road (Jacobs 2015). DEPWS maintain a gauging station and flood warning system for Rapid Creek.

Water quality is affected by above and below ground factors, with the main issues being bacteria and per- and polyfluoroalkyl substances (PFAS). Urban and industrial runoff contains rubbish from parks and suburbs, hydrocarbons, per- and polyfluoroalkyl substances, herbicides, pesticides, sediment, nutrients, and rubbish from land managers within the catchment; these are summarised in Table 1.

To better understand bacterial faecal indicators, Kaestli (2016) undertook an analysis of water samples collected between 2009 and 2016 from Rapid Creek and surrounding drains. The report concluded that faecal indicators peaked after first rains and storm water drains which only flowed after rainfall had significantly higher indicator levels than water from Rapid Creek.

The DoD recently completed a suite of studies on PFAS on the RAAF Base Darwin (DoD 2019). These studies led to development of the RAAF Base Darwin, PFAS Area Management Plan.

Table 1. Potential pollutant sources within the Rapid Creek Catchment

Land-use	Pollutant	Potential Source*
Rural Living	<ul style="list-style-type: none"> • Nutrients • Herbicides • Pesticides 	<ul style="list-style-type: none"> • Accumulated faecal matter (domestic animals) • Fertilisers • Low intensity agriculture
Sporting Facilities (grass sporting fields)	<ul style="list-style-type: none"> • Nutrients • Lead 	<ul style="list-style-type: none"> • Treated sewage effluent used to irrigate grass fields in the dry season • Remnant lead shot
Industrial/Commercial Development (DIA and DoD)	<ul style="list-style-type: none"> • Hydrocarbons • PFAS • Sediments • Nutrients • Herbicides 	<ul style="list-style-type: none"> • Oil spills • Land clearing for development (erosion) • Sewage spills • Land management practices such as prescribed burns and weed control
Urban Residential	<ul style="list-style-type: none"> • Sediments • Nutrients • Rubbish • Pesticides (garden use) • Herbicides (garden use) • Hydrocarbons (e.g. oil on roads) 	<ul style="list-style-type: none"> • Piped drainage systems from surrounding suburbs

* From Beagley (2014)

2.3 Bed, banks, and stability

The creek bed is poorly defined in the upper catchment becoming more pronounced downstream. Vegetation plays an important role in providing bank stability, and rock bars between Kimmorley Bridge and the Jingili Water Gardens footbridge aid in channel stability (Jacobs 2015). Vegetation may also lead to erosion by blocking the creek and directing flows towards the eroding banks.

The stability of Rapid Creek was the focus of the Jacobs (2016) study, which concluded that there was generally little erosion except in the area around the Jingili Water Gardens footbridge and water resources gauging station.

2.4 Vegetation, weeds, and fire

Most of the catchment has been cleared of vegetation (Figure 4). Vegetation communities of the Rapid Creek Catchment were mapped at 1:5,000 as part of the 1994 management plan. This mapping was incorporated in the remnant vegetation mapping of the Darwin region (DENR 2000) which mapped seven broad communities within the creek corridor at 1:10,000 (see Figure 4), with 14 sub-communities (Table 2). Eucalyptus woodland communities (dominated by *E. tetrodonta* and *E. miniata*) occur in the upper (eastern) reaches of the catchment, transitioning to mangrove communities and estuarine flats at the creek mouth. Melaleuca species dominate the creek's headwaters at the Marrara Swamp, with Lophostemon and Pandanus communities fringing the creek edges. Further downstream, monsoon rainforest vegetation extends along the creek banks.

The quality of this vegetation is being affected by fire and weeds. Weeds are present throughout the vegetation along the creek corridor, particularly in low lying grassland areas and in previously cleared areas (RCMP, 1994). RCLG and other major landholders (for example DoD and DIA) regularly undertake weed control at strategic locations within the creek corridor to improve vegetation quality and reduce the risk of fire from grassy weeds such as Gamba and Mission Grasses.

Fire is a useful management tool, but, if used incorrectly, can lead to decreased vegetation quality, and promote weed infestation. There is no available analysis on fire frequency and seasonality across the catchment but much of the vegetation in the Darwin area is perceived to be burnt too frequently.

2.5 Fauna

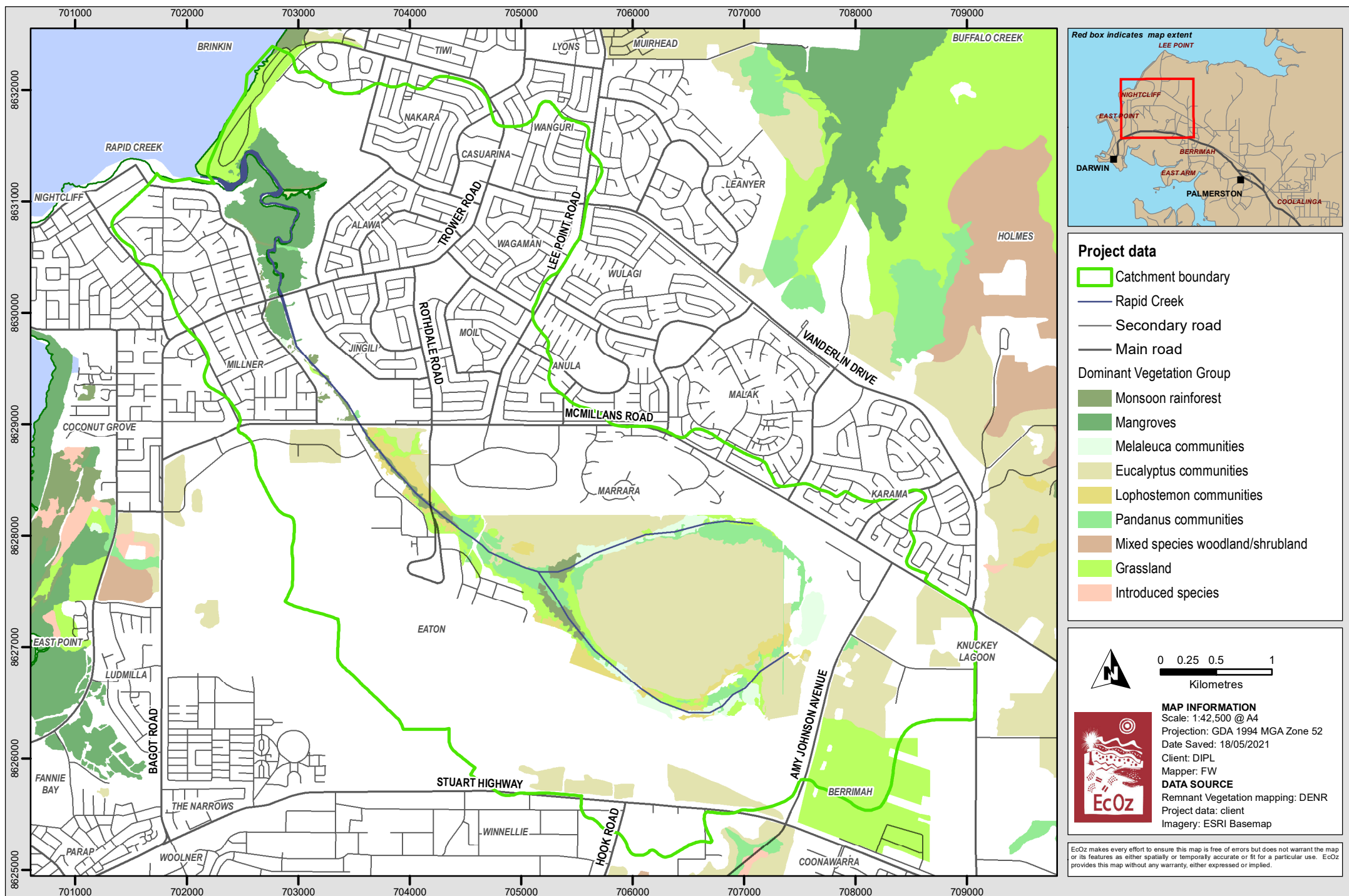
A suite of fauna utilises the catchment's vegetation; recent records of threatened species include the Black-footed Tree-rat, Pale Field-rat and the Darwin Cycad.

2.6 Heritage

Rapid Creek is on the traditional lands of the Larrakia people, who called it Gurumbai, which means elbow and describes the shape of the creek at the mouth (Beagley 2014). There are no known sacred or heritage sites within the catchment, but Beagley (2014) notes two significant Larrakia sites within the Rapid Creek Catchment.

Table 2. Vegetation communities mapped within the Rapid Creek catchment.

Vegetation community	Vegetation type	Area (ha)
Eucalyptus communities	<i>Eucalyptus tetrodonta</i> , <i>E. miniata</i> open forest with <i>Sorghum intrans</i> and <i>Heteropogon triticeus</i> grassland understorey.	116.4
	<i>Eucalyptus tetrodonta</i> , <i>E. miniata</i> woodland to low woodland, with mixed species mid stratum and grassland understorey.	263.5
Grassland	<i>Ischaemum australe</i> closed grassland seasonal swamp with <i>Bothriochloa bladhii</i> , <i>Xerochloa imberbis</i> and sedges including <i>Fimbristylis littoralis</i> and <i>Eleocharis spiralis</i> .	<1
	<i>Sorghum intrans</i> grassland, with <i>Yakirra nulla</i> , <i>Mnesithea rottboellioides</i> and <i>Aristida holathera</i> .	83.3
	<i>Sorghum intrans</i> , <i>Eriachne burkittii</i> , <i>Heteropogon contortus</i> mixed species grassland, with regeneration very low open woodland. Includes cleared or disturbed areas.	28.3
Lophostemon communities	<i>Lophostemon lactifluus</i> , <i>Pandanus spiralis</i> open forest, with <i>Sorghum intrans</i> and <i>Pennisetum polystachion</i> grassland understorey, and mixed shrubs and herbs.	30.6
Mangrove communities	<i>Ceriops tagal</i> , <i>Avicennia marina</i> , <i>Lumnitzera racemosa</i> , <i>Excoecaria ovalis</i> low closed forest generally 2-7m tall. Hinterland mangrove zone; the species may occur together or as locally pure stands.	67.4
	Salt flats. Hypersaline flats of bare sandy mud, with occasional shrubs such as <i>Batis argillicola</i> and <i>Suaeda arbusculoides</i> , and scattered stunted mangroves.	1.7
Melaleuca communities	<i>Melaleuca cajuputi</i> closed forest swamp.	0.3
	Regeneration <i>Melaleuca viridiflora</i> low woodland to low open woodland with <i>Pandanus spiralis</i> and <i>Lophostemon lactifluus</i> . Commonly includes areas of seasonal swamp.	32.4
Monsoon rainforest	Modified coastal rainforest community. Naturalised exotic trees are present, with some enrichment planting of local native species.	1.0
	<i>Acacia auriculiformis</i> open forest to closed forest - transition community generally associated with nearby rainforest.	1.1
	Mixed species monsoon rainforest associated with permanent moisture. Closed canopy 20-25m tall dominated by evergreen species, including <i>Acacia auriculiformis</i> , <i>Calophyllum soulattri</i> , <i>Carpentaria acuminata</i> , <i>Horsfieldia australiana</i> and <i>Syzygium nervosum</i> .	18.5
Pandanus communities	<i>Pandanus spiralis</i> low woodland to very low open woodland, with <i>Lophostemon lactifluus</i> and <i>Grevillea pteridifolia</i> . Ground layer dominated by mixed species grasses and sedges.	47.4



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\220062 - Rapid Creek PoM\01 Project Files\Fig X-X Map of remnant vegetation within the Rapid Creek catchment.mxd

Figure 4. Map of remnant vegetation within the Rapid Creek corridor and surrounds

3 STAKEHOLDERS AND TENURE

Given Rapid Creek's urban location, there are multiple stakeholders and tenure-holders with interests in its management. Table 3 lists key stakeholders and their responsibilities; Figure 3 depicts tenure within the catchment.

Table 3. Rapid Creek stakeholders and tenure holders

Stakeholder	Tenure holder	Responsibilities
City of Darwin (CoD)	Y	<ul style="list-style-type: none"> • Maintenance of catchment between Henry Wrigley Drive and Trower Rd.
NT Dept. of Infrastructure, Planning & Logistics (DIPL)		<ul style="list-style-type: none"> • Maintenance of NTG-controlled roads and the associated creek crossings (bridges and culverts)
Darwin International Airport (DIA)*		<ul style="list-style-type: none"> • Maintenance of the western side of the catchment upstream of Henry Wrigley Drive.
Dept. of Defence (DoD)		<ul style="list-style-type: none"> • Maintenance of the eastern side of the catchment upstream of Henry Wrigley Drive.
NT Parks & Wildlife Commission (PWCNT)		<ul style="list-style-type: none"> • Maintenance of the catchment downstream of Trower Rd
Charles Darwin University (CDU)		<ul style="list-style-type: none"> • Owner of largest portion of private land within the catchment – adjacent to Casuarina Coastal reserve in the NW of the catchment • Leases land from CoD along Lakeside Drive
Rapid Creek Water Advisory Committee (RCWAC)	N	<ul style="list-style-type: none"> • Provides advice to the Controller of Water Resources on water quality and water resource management issues affecting the creek and its catchment. • Contributes to the development of a Water Management Plan and to monitoring and annual assessment against the plan.
Rapid Creek Landcare Group (RCLG)		<ul style="list-style-type: none"> • Preservation of ecological aspects of the creek system through on-ground works, awareness-raising and advocacy
NT Dept. of Environment, Parks and Water Security (DEPWS)		<ul style="list-style-type: none"> • Water quality monitoring • The NT land zoning system. Resolving management issues within the whole of the catchment. • V-notch weir and gauging station infrastructure
Larrakia Nation		<ul style="list-style-type: none"> • Traditional owners of the Darwin area, of which Rapid Creek forms and important spiritual and community aspect.
Residents		<ul style="list-style-type: none"> • Comply with any relevant legislation (e.g. clearing, weed management and pollution)

4 MANAGEMENT AND RESPONSIBILITIES

This plan is centred on understanding the issues that may affect this plan's vision and allocating responsibility for managing these issues. To achieve the plan's vision, management will focus on the following aspects:

- Bed and banks
- Vegetation and soil integrity (erosion)
- Hydrology
- Water quality
- Outstanding tenure issues and hydrological infrastructure

These are each discussed below.

4.1 Bed and bank condition

Ensuring the integrity of the Rapid Creek channel and its supporting vegetation will ensure correct functioning of the waterway including its ability to discharge water from the catchment.

4.1.1 Knowledge of aspect and impacts

An assessment of the channel's condition was undertaken in 2015 (Jacobs 2015). They reported some erosion and identified the issues that can lead to further erosion. These were later captured in the *Rapid Creek Maintenance Framework* (Jacobs 2016), which identified a number of actions to manage erosion, the extent that these works have been performed, and the current status of erosion and trends is unknown. It is a recommendation of this management plan that in-stream erosion is assessed during the life of this plan.

The loss of integrity of bed and banks could be due to:

- Increased water flows into the channel.
- Concentrated water flows particularly at drainage outlets.
- Reduction of riparian vegetation making banks unstable.
- Existing erosion spread.

4.1.2 Responsibility and proposed management

Bed and banks of NT waterways are vested in the Crown, and it is the NTG who is responsible for managing in-stream erosion. Responsibility for managing riparian vegetation is discussed in Section 4.2.

Any management response would require to be informed by a re-assessment of in-stream erosion.

4.1.3 Outcomes expected and assessment of effectiveness

The outcomes expected from this plan are:

- Each landholder to conform to the vegetation condition obligations (Section 4.2).
- That funding is found during the term of this plan to reassess the in-stream erosion using Jacobs (2016) as a baseline.

Effectiveness will be that in-stream erosion is at least stabilised over the duration of this plan.

4.2 Vegetation extent and quality

Retaining and augmenting the remnant vegetation extent and quality is a key objective of this management plan given the important role it plays in bank stabilisation, provision of wildlife habitat, cultural uses, and amenity. Currently fire and weed management plans are developed by the DIA and DoD and possibly others.

4.2.1 Knowledge of aspect and impacts

The vegetation communities of the RCC were discussed in Section 2.4. This mapping was done in 1994 and it is unknown to what extent these communities have changed over time. It is a recommendation of this management plan that the vegetation communities are mapped at an appropriate scale every five years to determine the effectiveness of this and subsequent plans.

An estimate of the total amount of riparian vegetation and remnant vegetation is presented in Table 4. Vegetation condition (including the extent of weeds and fire impact) and the vulnerability to clearing is unknown.

Changes in vegetation extent or quality can be due to:

- Clearing of land for development
- Loss of vegetation extent/quality through inappropriate fire management
- Weed infestation leading to decreased vegetation quality, amenity and, in some cases where Gamba Grass is prevalent, prompting fire.

Table 4. Amount of riparian and remnant vegetation within each landholding

Tenure-holder	Bed and banks (ha) *	Remnant Vegetation (ha)
NTG-Crown lease	0	8.4
CoD	11.2	27
DIA	2.1	39.8
DoD	28	388.2
PWCNT	13.5	92.7
CDU	0	0.49
Private	0	128.6
Total	54.7	684.7

* Area was calculated by using 25m either side of the mapped centre line of Rapid Creek.

4.2.2 Responsibility and proposed management

It is the responsibility of each landholder to manage class A and B weeds on their land under the NT *Weeds Act*. There is no similar obligation for vegetation management except that fire breaks are required to be maintained.

The RCWAC has little opportunity to influence land clearing except in providing advice to the Minister. Where there are large patches of vegetation the land holder will, under this plan of management, be expected to:

- When intending to remove any vegetation in riparian or public lands, submit a Land Clearing Management Plan to RCWAC for review.
- Develop and implement a Fire Management Plan that incorporates maintaining vegetation health.
- Develop and implement Weed Management Plan that ensures that important weeds and managed.

RCWAC will be responsible for:

- Ensuring that each relevant land holder develops the plans above.
- Reviewing plans received to ensure that they are in agreement of the intent of this plan.
- Reporting, at least through RCWAC minutes, that the plans are received and their suitability and implementation.

4.2.3 Outcomes expected and assessment of effectiveness

It is an outcome expected of this plan that, within its first year of operation, each relevant landholder has developed publicly available fire and weed management plans. In each subsequent year for the duration of the RCMP each landholder's weed and fire management plans are to be implemented and this reported back to the RCWAC.

Effectiveness will be assessed by:

- Each fire and weed management plan being suitable and implemented.
- Any Land Clearing Management Plan being suitable.
- Vegetation mapping showing no deleterious changes to vegetation communities in the last five years¹

4.3 Hydrology

Hydrology is at the core of a functioning waterway. Increases to and concentration of flows has led to more water being discharged through the channel and the need for flood control devices (see Section 2.2). How the creek functions to remove water may be affected by in-stream blockages from vegetation growing in new places, displaced vegetation accumulating to form dams, and the installation and management of infrastructure.

4.3.1 Knowledge of aspect and impact

Development of the catchment (Figure 2) and replacing soils with impermeable surfaces may have led to an increase in instantaneous flows into the creek and potentially more flooding. This increase in impervious surfaces may have also reduced the groundwater levels which support Rapid Creek's dry season flows.

Infrastructure that affects drainage includes stormwater outfalls (open drains and pipes) and bridge culverts. Poor management of these impacts on the river by accelerating erosion and accretion of sediment; the latter leads to vegetation growing within the river's bed and consequential flow impediment.

The hydrology is affected by:

- vegetation clearing
- vegetation instream recruitment
- the introduction of impermeable surfaces
- channelling stormwater in drains and pipes

There is no known groundwater extraction and no licences for such have been issued within the catchment.

¹ Deleterious changes, as used here, refers to a change of vegetation community towards a less desirable type for that location. For example, a transition of riparian vegetation to sparse woodland would be seen as a deleterious change.

4.3.2 Responsibility and proposed management

The catchment is already well developed, and putting retrospective obligations on landholders would not be feasible, furthermore, in the suburban part of the catchment, each landholder owns only a small block of a large suburbia.

The existing Berrimah North Area Plan, which specifies the condition for development east of Amy Johnson Avenue specifies no net increase in in-flows into the catchment. For all future developments within the catchment, the developer is responsible to determine the effect on Rapid Creek hydrology and should use the Berrimah North model.

Primary responsibility of drainage infrastructure rests with CoD for stormwater drains, NTG for bridge culverts and with secondary responsibility lies with other landholders for stormwater drainage.

The management and maintenance of infrastructure should be planned, and these plans made publicly available.

4.3.3 Outcomes expected and assessment of effectiveness

The outcomes expected of this plan are:

- No increase in flows into Rapid Creek.
- RCWAC to lobby for drainage infrastructure management plans to be developed and implemented.

Effectiveness will be assessed by:

- All new developments within the RCC have assessed potential changes to surface water.
- Drainage infrastructure plans developed, implemented, and made public.

4.4 Water quality

Water quality impacts range from those affecting amenity, such as rubbish, to chemicals, that may affect the creek biology or human health.

4.4.1 Knowledge of aspect and impact

Water quality is currently impacted from a range of sources including inflows containing PFAS, nutrients, pesticides/herbicides, hydrocarbons, sediment, and rubbish. This affects both surface and groundwater. Potential pollutant sources are outlined in Table 1.

There is water quality monitoring undertaken by the DIA, DoD, and DEWPS. The RCWAC is working towards a more cohesive and collaborative water quality monitoring strategy involving these major stakeholders.

4.4.2 Responsibility and proposed management

It is the responsibility of each landholder to manage pollutants from land they manage. DIA and DoD are currently monitoring water quality within the area of their responsibility, and the other major landholders (CDU, CoD, NTG) are encouraged to develop a plan for managing the quality of the ground and surface water. These plans should aim to develop consistency in water quality monitoring and analysis.

As these water quality plans become available, RCWAC will ensure that they are relevant, consistent, and are being implemented. This will be reported through meeting minutes.

4.4.3 Outcomes expected and assessment of effectiveness

It is an outcome expected of this plan that, within its first year of operation, each large landholder will develop a Water Quality Management Plan (WQMP). In subsequent years for the duration of this RCMP, each landholder is to report on the implementation of the management plan to the RCWAC.

Plan effectiveness will be assessed by:

- The development and implementation of WQMP's.
- Standard water quality parameters sampled by all relevant parties.

In the longer term, RCWAC is required to report on their progress to develop a water quality monitoring strategy.

4.5 Resolving tenure issues

Identifying management responsibilities underpins the operation of this plan. Any uncertainty or unfavourable land tenure would impact on successful implementation of this plan.

4.5.1 Knowledge of aspect and impacts

There are two relevant issues to be addressed during the term of this management plan.

The part of Casuarina Coastal Reserve within the RCC is currently Crown land. This area would have greater protection if it was made a Section 12 park under the *Territory Parks and Wildlife Conservation Act 1976*.

Secondly, there is a small wedge of bushland within Lot 5936 that would be better managed if it was transferred to the CoD. In 2009, Lot 5249 was transferred from NTG to CoD to protect Rapid Creek when the netball complex was built. The line shown in Figure 5 shows a more logical boundary particularly now that the wedge is isolated from the rest of 5936 by the fenced flood mitigation drain.

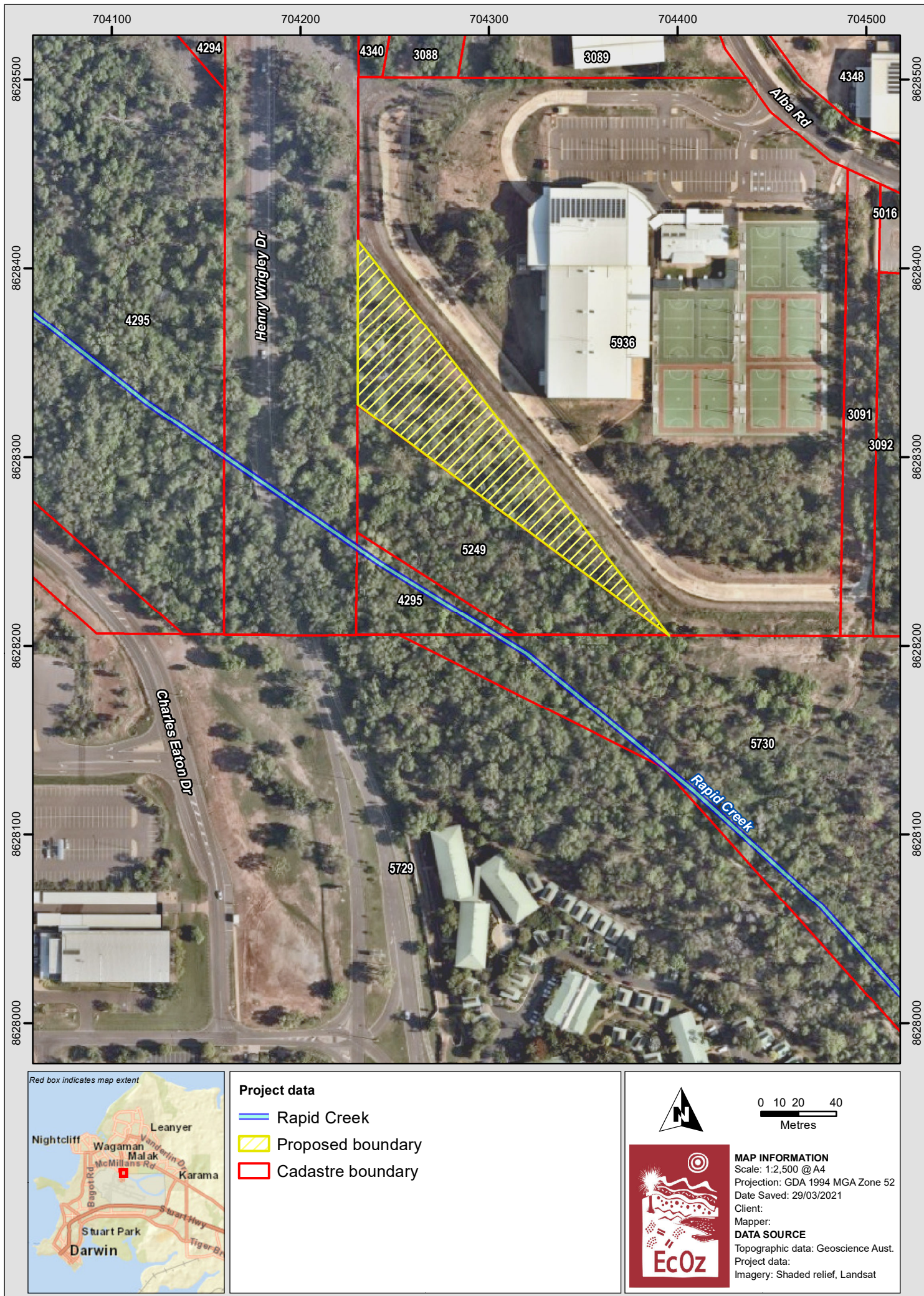
4.5.2 Responsibility and proposed management

The responsibility of both these items is with the NTG, however the RCWAC will support:

- Defence and the NTG to resolve the management of this small parcel of vegetation.
- Any moves by the NTG to get the Casuarina Coastal Reserve part of the RCC listed as a section 12 park.

4.5.3 Outcomes expected and assessment of effectiveness

Effectiveness will be assessed by both these outcomes being achieved.



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\IEZ20062 - Rapid Creek PoM\01 Project Files\Netball cadastre.mxd

Figure 5. Aerial imagery showing contested land

5 RCWAC PRIORITY ACTIONS

RCWAC workshopped and prioritised the actions to achieve good management of the Rapid Creek catchment. These actions are outlined below.

5.1 Governance and stakeholder engagement

- Retain the RCWAC and its membership and provide publicly available minutes and advice to key Government leaders within the NT.
- Facilitate the resolution of tenure issues within the catchment as far as practicable.
- Work towards integrated/coordinated reporting of the health of Rapid Creek to share with the community.

5.2 Fire and weed management

- Promote, review and report on the implementation of Weed Management Plans and Fire Management Plans across tenures.
- Encourage coordination of plans between landholders and investigate the potential for publishing Fire and Weed Management Plans
- Engage across NTG Departments to reduce fire impacts on biodiversity and air quality.

5.3 Creek inflows

- Monitor land developments within the catchment with a view that the hydrology is managed such that no greater inflows to the creek occur.
- Lobby for drainage infrastructure plans and the reinstatement of Gross Pollutant Traps at key locations.

5.4 Cultural and natural values

- Establish a biodiversity assessment of the catchment and provide the data for integrated reporting.
- Understand and incorporate community values in catchment management.
- Identify and collate priority natural and cultural assets within the catchment to coordinate management strategies and communicate catchment values to stakeholders.

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