5 THREATENED SPECIES

The threatened species assessment comprised three components:

- An initial desktop likelihood of occurrence assessment to identify threatened species that may occur within the study area.
- A field survey to assess habitat suitability within the study area for each threatened species identified in the initial desktop assessment.
- A revised likelihood of occurrence assessment based on the results of the field survey and habitat assessment.

The following sections detail the methodology and results for each component.

5.1 Desktop assessment

This section outlines the procedure and results of the initial threatened species 'likelihood of occurrence' assessment conducted for this report. The assessment was undertaken using available desktop information and databases of existing records and potential species.

The purpose of this assessment is to identify those species that may need to be included within the project's risk or impact assessment, and those that can be reasonably excluded from further consideration because they are unlikely to occur within the study area. This process is not a risk assessment because it does not account for project activities and their potential impacts.

The International Union for the Conservation of Nature nominates a set of criteria used to identify species at risk of extinction. These criteria are used to define categories of risk - see Figure 5-1 - which are used by the NT Government to determine which threatened species are listed under the TPWC Act, and by the Commonwealth Government to determine which threatened species are listed under the EPBC Act. This report focuses on species that are listed as Vulnerable, Endangered or Critically Endangered under either Act.

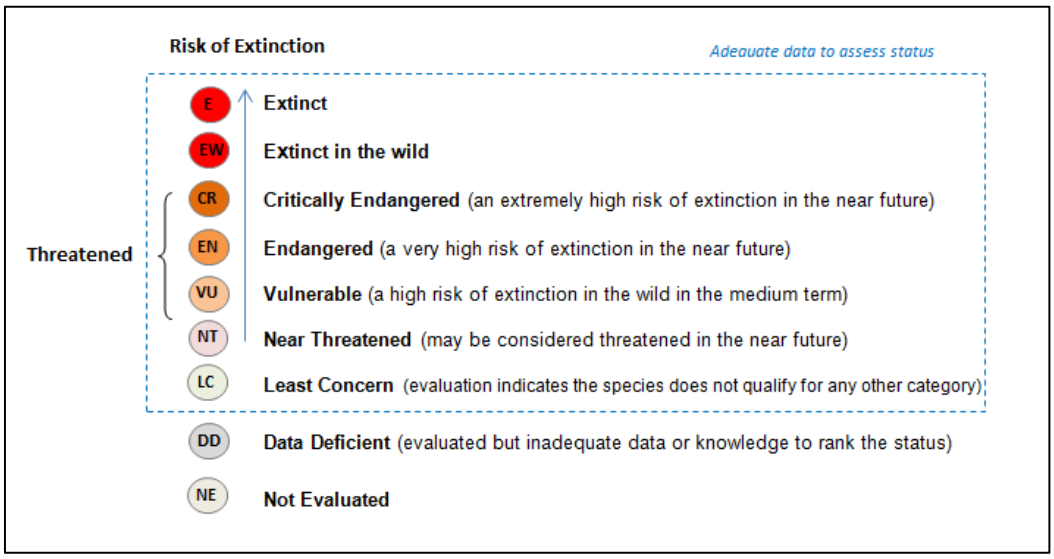

Figure 5-1. The IUCN categories of risk for species

The threatened species likelihood assessment used a broad-scale approach as recommended by the (draft) *Guidelines for Assessment of Impacts on Terrestrial Biodiversity* (DLPE 2025). This aims to ensure that all relevant species are properly interrogated. The procedure used is described in Appendix E.

A total of 34 threatened species were considered in the 'likelihood of occurrence' assessment. The results from the threatened species 'likelihood of occurrence' assessment are detailed in Appendix E, presented in Table 5-1, and summarised as follows:

- Two species have a high likelihood of occurring.
- Four species have a medium likelihood of occurring.
- The remainder have a low or no likelihood of occurring.

Those species with a high or medium likelihood of occurring are discussed further below.

Table 5-1. Desktop threatened species likelihood of occurrence assessment (summary)

Class	Name	EPBC	TPWC	Expected occurrence
High likelihood of occurrence				
REPTILE	Plains Death Adder *Acanthophis hawkei*	VU	VU	Many relevant records*. Black soil / clay plains (vertosols) – especially areas that have a high incidence of fissures/cracks. Most likely to be encountered within the Mitchell Grass Downs bioregion (i.e. south of MAKP 137); however, could occur anywhere where suitable habitat is present.
	Yellow-spotted Monitor *Varanus panoptes*	-	VU	Many relevant records. Species most likely to be encountered within alluvial, drainage and clay (downs) plain landscapes, and adjacent plains. Not expected to occur south of MAKP 410.
Medium likelihood of occurrence				
BIRD	Gouldian Finch *Chloebia gouldiae*	EN	VU	A few relevant records. Nesting habitat (Snappy Gum with suitable hollows, typically on rocky hills) and foraging grass species in the northern portion of the study area. Most likely to occur within lateritic plains and rises landscapes. Not expected to occur south of MAKP 74.
	Grey Falcon *Falco hypoleucos*	VU	VU	A few relevant records. Entire study area is considered within species' distribution and provides potential foraging habitat. The study area crosses 19 major waterways (all south of MAKP 168); these areas may support suitable nesting habitat (typically the tallest trees on larger waterways).
	Painted Honeyeater *Grantiella picta*	VU	VU	A few relevant records. Entire study area occurs within species' distribution. Potential feeding/nesting habitat (high concentrations mistletoe) may occur within vegetation communities that support Acacia, Eucalyptus or Corymbia as the dominant species (because these species can be mistletoe-hosts). Mistletoe-host species are most likely to occur within the lateritic plains and rises, and sandstone plains.
REPTILE	Northern Blue-tongued Skink *Tiliqua scincoides intermedia*	CR	-	A few relevant records. Northern section of study area is on the edge of known species' distribution. Areas with dense ground vegetation – particularly near water – in the northern portion of the study area within lateritic plains and rises.
Low likelihood of occurrence				
BIRD	Red Goshawk *Erythrotriorchis radiatus*	EN	VU	Vagrant in the region.
	Crested Shrike-tit (northern) *Falcunculus frontatus whitei*	VU	NT	Outside known distribution, no relevant records.
	Partridge Pigeon (eastern) *Geophaps smithii smithii*	VU	VU	

Class	Name	EPBC	TPWC	Expected occurrence
	Night Parrot *Pezoporus occidentalis*	EN	EN	Outside known distribution, no relevant records. Typically prefers long unburnt Spinifex, which is not known to occur in the study area.
	Princess Parrot *Polytelis alexandrae*	VU	VU	Absence of suitable habitat in the study area. If present, would only be expected to be dispersal flocks transiting through study area during boom periods.
	Masked Owl (northern) *Tyto novaehollandiae kimberli*	VU	VU	Edge of known distribution, no relevant records. Potential habitat present, with preference for taller trees, within lateritic plains and rises, and along creeklines (present in the south of the study area).
BIRD (WETLAND)	Sharp-tailed Sandpiper *Calidris acuminata*	VU	-	Wetland habitat most likely to occur within the Mitchell Grass Downs bioregion, particularly after rain. Significant wetland features do not occur within the study area. There are some minor wetland habitats that are subject to seasonal inundation within the study area (most are not intersected by the Rev 1.0 of the NEA pipeline). If individual members of some threatened wetland species were to seasonally utilise this habitat, this occurrence is expected to be for a short period and in low abundances. Additionally, any threatened wetland species that could utilise habitat within the study area would be expected to preferentially utilise the larger, more suitable wetland areas in the region.
	Curlew Sandpiper *Calidris ferruginea*	CR	VU	
	Bar-tailed Godwit (Northern Siberian) *Limosa lapponica menzbieri*	EN	CR	
	Black-tailed Godwit *Limosa limosa*	EN	-	
	Australian Painted Snipe *Rostratula australis*	EN	EN	
	Common Greenshank *Tringa nebularia*	EN	-	
MAMMAL	Northern Quoll *Dasyurus hallucatus*	EN	CR	No relevant records and absence of prime rocky habitats.
	Greater Bilby *Macrotis lagotis*	VU	VU	Outside known distribution and no preferred habitat.
	Pale Field-rat *Rattus tunneyi*	-	VU	No relevant records; potential habitat is outside known distribution.
	Northern Brushtail Possum *Trichosurus vulpecula arnhemensis*	VU	NT	Outside known distribution and no preferred habitat.
	Common Brushtail Possum (Central and south-eastern) *Trichosurus vulpecula vulpecula*	-	EN	
MAMMAL (BATS)	Ghost Bat *Macroderma gigas*	VU	NT	No relevant records. Paucity of rocky habitat for roosting in the study area.
	Bare-rumped Sheath-tailed Bat *Saccolaimus saccolaimus nudicluniatus*	VU	NT	Outside known distribution.
REPTILE	Mitchell's Water Monitor *Varanus mitchelli*	CR	VU	Outside known distribution.
	Mertens' Water Monitor *Varanus mertensi*	EN	VU	
PLANT	Tassel Sedge *Carex fascicularis*	-	VU	Outside known distribution.

Class	Name	EPBC	TPWC	Expected occurrence
No likelihood of occurrence (i.e. None)				
Southern Whiteface (*Aphelocephala leucopsis*), *Plains-wanderer* (*Pedionomus torquatus*), Western Quoll (*Dasyurus geoffroii),* Great Desert Skink (*Liopholis kintorei),* Gulf Snapping Turtle (*Elseya lavarackorum),* Freshwater Sawfish (*Pristis pristis).*				

*CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened. * 'Relevant records' are those that are recent (last few decades) and from habitats likely to be present within t*

5.2 Habitat suitability survey

The desktop threatened species likelihood of occurrence assessment identified six conservation-significant species with a high or medium likelihood of occurring within the study area.

Targeted presence/absence surveys for these species were not undertaken. The species identified are generally wide-ranging and mobile (i.e. not restricted range), with distributions extending well beyond the study area. In the context of a linear pipeline corridor, which represents a narrow and localised disturbance footprint, the key consideration is the availability and distribution of important habitat features rather than the occurrence of individual animals at a particular point in time. The presence of an individual threatened species during a survey provides limited information for impact assessment in this context unless the habitat resources upon which the species depends are also present.

Accordingly, the field survey focussed on assessing the suitability of habitat within the study area for each threatened species identified during the desktop assessment. This included identifying and mapping critical habitat features in the study area relevant to each species. The results, summarised in Table 5-2, provide the basis for impact avoidance and mitigation measures and inform the subsequent assessment of potential impacts on threatened species and their habitats (not undertaken in this report).

Additionally, incidental evidence, sightings, or suitable habitat of other threatened, migratory, Near Threatened and Data Deficient species were also recorded.

Methods and results for each of the six species are provided in Section 5.2.1 to Section 5.2.6.

Table 5-2. Threatened species and habitat features

Species	Habitat	Critical habitat features
Plains Death Adder (*Acanthophis hawkei*)	Clay plains	Refugial fissures or crevices in cracking black soil plains
Yellow-spotted Monitor (*Varanus panoptes*)	All	Active burrows
Gouldian Finch (*Chloebia gouldiae*)	Lateritic plains and rises	Suitable nesting hollows in nesting tree species (*Eucalyptus leucophloia* and *Corymbia dichromophloia*)
Grey Falcon (*Falco hypoleucos*)	Alluvial floodplains	Tall nesting trees along drainage lines
Painted Honeyeater (*Grantiella picta*)	All	High concentrations of mistletoe
Northern Blue-tongued Skink (*Tiliqua scincoides intermedia*)	Lateritic plains and rises	Micro-habitats of dense vegetation (particularly Bullwaddy patches and drainage areas)

5.2.1 Plains Death Adder (*Acanthophis hawkei*)

The Plains Death Adder is listed as Vulnerable under the EPBC Act and TPWC Act. It is a nocturnal species that occurs on cracking soil floodplains in the Top End, extending inland to cracking black soil plains (DLPE 2025, Webb et al. 2002). According to Ward and Phillips (2012):

During the Wet season, individuals move every three to ten days, in apparently random directions, distances ranging from a few metres to a kilometre (Phillips and Webb, unpublished data). When it floods, they simply float in debris or rest on emergent vegetation. During the Dry season, movement is less frequent and they often retreat into deep soil cracks. Radio-tracking suggests that they are nomadic and do not have definable home ranges.

The Plains Death Adder is known from two disjunct occurrences – the floodplains of the Adelaide, Mary and Alligator Rivers, and the black soils of the Barkly Tableland portion of the Mitchell Downs (DLPE 2025). It is unknown whether these are separate populations or simply reflect the low survey effort across the species' potential habitat. There are also citizen science records attributed to this species that are doubtful because they are not located in suitable habitat, including those from Cloncurry (QLD), Darwin, west of the Stuart Highway and Elliott.

The exact distribution of the Plains Death Adder within this range remains unclear. Based on documented field experience and encounter rates across its range, the species can be locally common (in the absence of Cane Toads) on the highly productive floodplains of northern Australian rivers. However, on the Barkly Tableland and Mitchell Grass Downs (where the NEA Pipeline is located), the species is less commonly encountered and is probably scarce in this habitat (DSEWPAC 2012).

The main identified threat to the Plains Death Adder is death by ingestion of the introduced Cane Toad (*Rhinella marina*) (TSSC 2012).

Survey context

The Plains Death Adder was assessed as having a high likelihood of occurrence within the study area due to the presence of records and suitable habitat. The study area crosses the cracking black soils of the Barkly Tableland, one of the two known areas to support Plains Death Adder in the NT.

Historic records of Plains Death Adder occur in the Barkly Tablelands region within areas traversed by the study area – predominantly to the south-west, but also within ~5 km (Figure 5-3). However, there are only three recent NT Atlas records of Plains Death Adder in the Barkly Tablelands – all more than 50 km from the study area. This low detection rate is likely influenced by population decline due to Cane Toads, as well as by poor detectability arising from the isolation of the Barkly Tablelands and the cryptic nature of the Plains Death Adder. In the south, there are few records of the Plains Death Adder near the Barkly Highway, and only one record south of the Barkly Highway. This scarcity of records is not necessarily an artefact of survey effort. In a report on fauna species recovered from trench surveys during the installation of the Northern Gas Pipeline (which runs south of the Barkly Highway from Tennant Creek to Mount Isa), the trench cut through approximately 100 km of suitable habitat for the Plains Death Adder. Although more than 12,500 animals were recorded in the trench, none were Plains Death Adder (Swan et al. 2019).

Survey methodology

During aerial surveys, all occurrences of cracking black-soil plains were identified, mapped and aerial habitat checks conducted. Checks involved flying over suitable habitat, whilst surveyors searched for patches containing deep cracks and fissures, which serve as potential refugia for the species. If suitable habitat features were detected, a ground-sign check site was conducted.

Ground-based surveys were strategically undertaken to check for sign and rule out potential 'false absence' data associated with the aerial-based observations. Ground-based habitat checks typically involved a 10-minute search on foot.

Results and discussion

Three landforms from the land type mapping detailed in Section 3 have clay soils/vertosols and are therefore considered to support suitable habitat for Plains Death Adder – alluvial plains, downs (clay) plains and drainage systems (Figure 5-3). In addition, inland wetlands may provide suitable habitat. Of these, the downs (clay)

plains are considered the primary habitat, which occurs mostly within the Mitchell Grass Downs bioregion, approximately south of MAKP 140 (Figure 5-3).

The aerial survey confirmed that cracking clay plains and associated vertosol landforms are widespread throughout the southern section of the study area, particularly within the Mitchell Grass Downs bioregion south of MAKP 140. Suitable habitat for the Plains Death Adder can be confirmed as broadly occurring across the mapped alluvial plains, downs (clay) plains and drainage system landforms associated with cracking black soils.

The assessment identified 50,467 ha of suitable habitat for the Plains Death Adder within the study area and 4,478,108 ha of suitable habitat within a 50 km buffer (Table 5-3).

Table 5-3. Potential habitat extent for Plains Death Adder within the study area and surrounds

Landform class	50 km buffer (ha)	Study area (ha)
Alluvial plains	930,151	8,793
Drainage systems	41,023	345
Downs plains	3,314,344	41,271
Inland wetlands	192,590	58
TOTAL	**4,478,108**	**50,467**

Dense grass cover present at the time of survey limited surveyors' ability to identify and map potential refugial habitat features at a finer scale by obscuring visibility of surface cracks and fissures that would otherwise be used to identify areas of potentially higher habitat value for the species. As a result, it was not possible to distinguish specific refugial areas within the broader clay plain landscape along the alignment.

No Plains Death Adders or species-specific field sign were detected during the survey.

Given the species' cryptic nature, low detectability and the limitations imposed by seasonal vegetation cover, the absence of records is not considered indicative of species' absence. A precautionary approach is recommended, with all cracking clay plain landforms within the study area assumed to have the potential to support Plains Death Adder.

Figure 5-2. Photographs of extensive downs (clay) plains within the study area (considered as suitable habitat for Plains Death Adder)

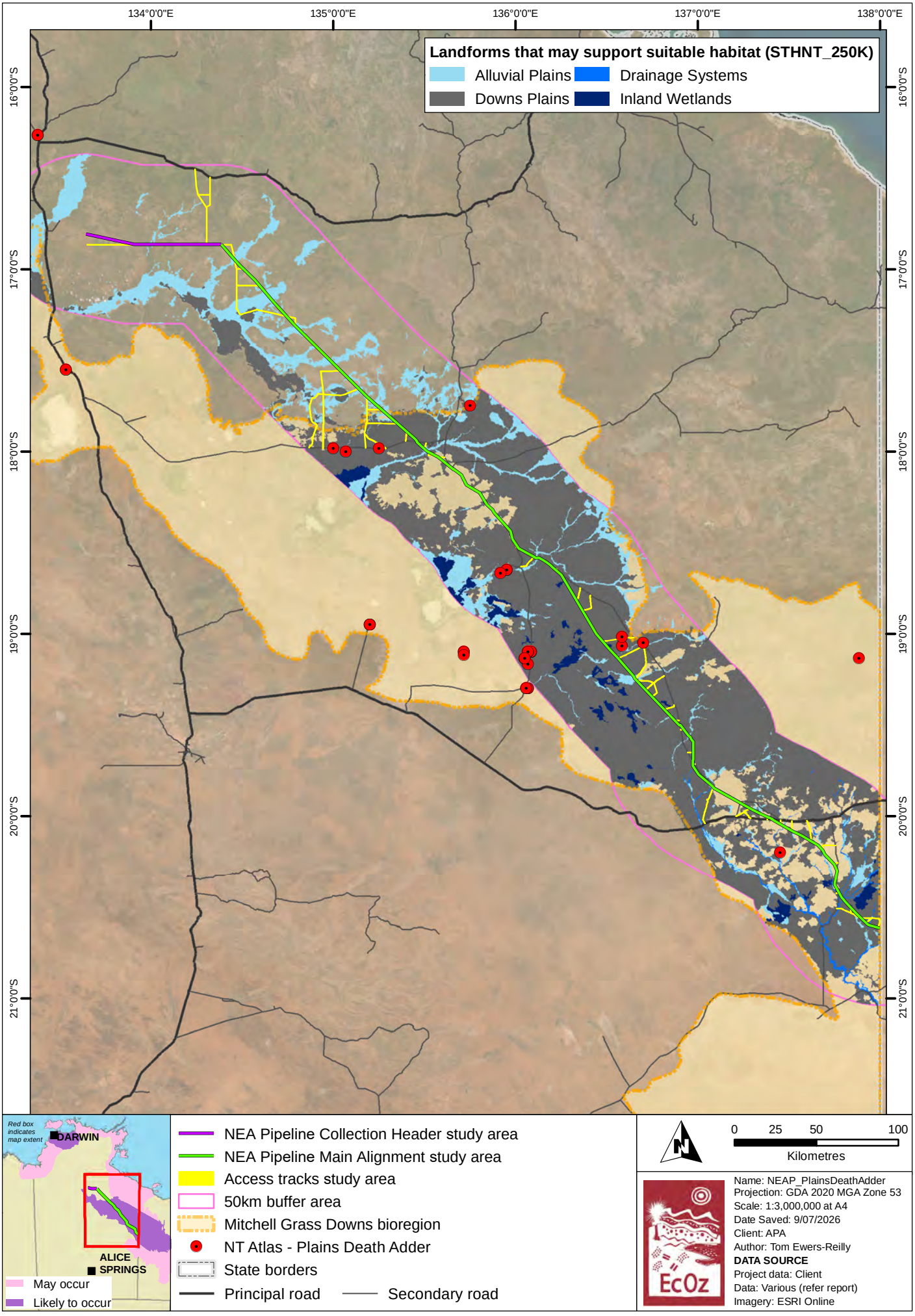

Figure 5-3. Map of Plains Death Adder NT Atlas records and preferred habitat in the region of the study area

5.2.2 Yellow-spotted Monitor (*Varanus panoptes*)

The Yellow-spotted Monitor or Floodplain Monitor is listed as Vulnerable under the TPWC Act. It is a large ground-dwelling monitor that can grow up to 1.4 m. It feeds primarily on small terrestrial vertebrates and insects, and lays a clutch of eggs in a burrow, usually in the Wet season (Ward et al. 2012). The species can occur in a variety of habitats – including coastal beaches, floodplains, grasslands and woodlands across the extent of northern Australia. In dry periods of the year, the species has been found to remain near water resources, then spreading into surrounding habitats during wetter periods (Ward-Fear et al. 2018, Shine 1986). The propensity of the Yellow-spotted Monitor to eat Cane Toads and die from the ingested toxins has caused a significant decline in the population (Doody et al. 2009; Ujvari & Madsen 2009).

Survey context

The entire study area falls within the known distribution of the Yellow-spotted Monitor. The species is considered to have a high likelihood of occurrence within the study area due to the presence of recent records and suitable habitat. Moreover, SREBA species' distribution modelling is available for the northern 150 km of the study area (Young *et al.* 2022; NTG 2023); which indicates a high probability of occurrence in most areas (inset Figure 5-5).

There are multiple recent records of the Yellow-spotted Monitor within 50 km of the study area, generally occurring in three clusters (Figure 5-5):

- Cluster 1: 10 km north-west of CHKP 0 at the north end of the study area (2017 to 2021)
- Cluster 2: 27 km west of the study area between MAKP 30 and MAKP 90 (2012 to 2021)
- Cluster 3: On both sides of the study area between MAKP 250 and 350 (undated, 2001 to 2016), including one record (2009), approximately 100 m outside the study area between MAKP 253 and MAKP 254.

Survey methodology

During aerial surveys, surveyors searched for field sign (burrows, tracks and scats) and incidental species sightings whilst flying over suitable habitat landforms, including alluvial plains, downs (clay) plains, inland wetlands, and drainage systems.

Where field sign was observed, an aerial habitat check site was recorded. Ground-based surveys were strategically conducted to verify the sign and rule out potential 'false absence' data associated with the aerial observations. Ground-based habitat checks typically involved a 10-minute search on foot.

Results and discussion

The aerial survey confirmed widespread presence of suitable habitat for the Yellow-spotted Monitor along the alignment. Yellow-spotted Monitors are habitat-generalists and could occur across the entire study area, but particularly within alluvial plains, downs (clay) plains, inland wetlands and drainage systems (mapped on Figure 5-5). Based on the land type mapping detailed in Section 3, there is 50,467 ha of preferred habitat for the Yellow-spotted Monitor within the study area, compared to 4,478,108 ha of suitable habitat within a 50 km buffer.

One Yellow-spotted Monitor was observed during the survey at the entrance to a large burrow in a patch of closed Turpentine (*Acacia lysiophloia*) shrubland on laterite plain, just south of Lorne Creek (KP 446.6), confirming the species' presence within the study area and supporting the desktop assessment that the species is likely to occur broadly across the landscape. The species is highly mobile and capable of utilising a wide range of open habitats and water-associated environments across the landscape.

Figure 5-4. Photographs of Yellow-spotted Monitor burrow at site 174 (KP 446.6)

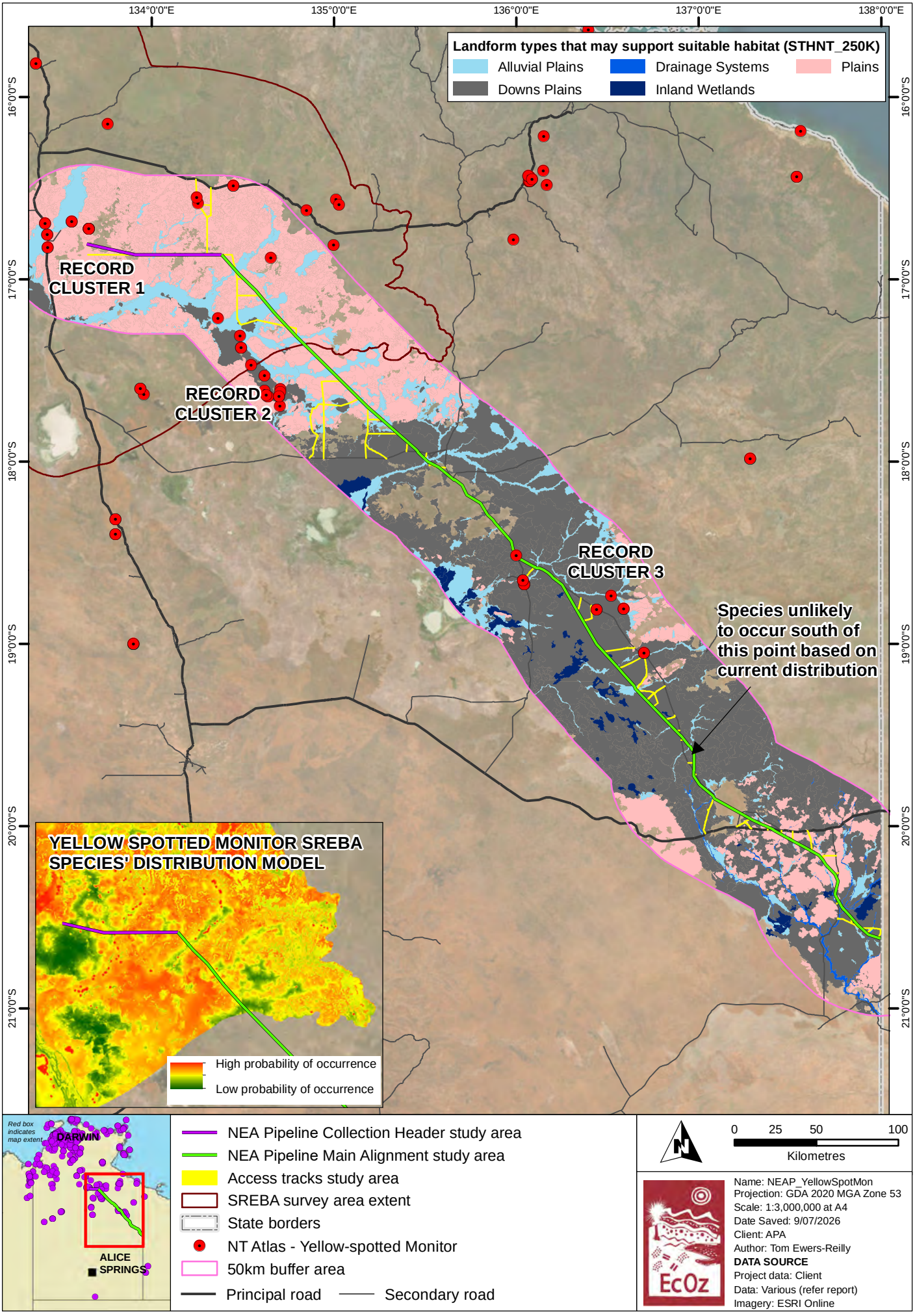

Figure 5-5. Map of Yellow-spotted Monitor NT Atlas records and preferred habitat areas

5.2.3 Gouldian Finch (*Chloebia gouldiae*)

The Gouldian Finch is listed as Endangered under the EPBC Act and Vulnerable under the TPWC Act. It is a small, brightly-coloured bird that is an obligate seed eater and adept at dispersing across the landscape. Gouldian Finch occupy two different regions of the landscape on an annual cycle (Dostine *et al.*, 2001). In the dry season and part of the late wet season, between February and October, the species lives within wooded hills that contain groups of smooth-barked *Eucalyptus* species commonly referred to as snappy or salmon gums – including *Eucalyptus leucophloia, E. tintinnans, E. brevifolia* (Tidemann *et al.* 1992, 1999; O'Malley 2006; DEPWS 2021b). Hollows in these trees provide nesting sites. There are also some records of the species nesting in hollows in *E. miniata* and *Corymbia dichromophloia*; however, it is noteworthy that although present, these were not tree species considered by the NT Government in their assessment and modelling of Gouldian Finch for the SREBA.

During this period, the species forages on the ground, feeding on fallen seeds of annual grasses (e.g. *Sorghum* and *Schizachyrium* species) – especially annual Sorghum, *S. intrans, S. stipoideum* and *S. timorense* – and finds water at small rocky waterholes that remain within the hills until the following wet season (Dostine *et al.* 2001). In the wet season, when the seed supply of annual grasses is depleted, Gouldian Finches move from the hills into lowland drainages to feed on the seeds of perennial grasses, typically available from mid-December. These grasses include soft Spinifex (*Triodia* species), Cockatoo Grass (*Alloteropsis semialata*) and Golden Beard Grass (*Chrysopogon fallax*) (Dostine &Franklin 2002). The sensitivity of these perennial grasses to over-grazing and frequent fires is thought to be the leading cause of the widespread declines of the Gouldian Finch (Crowley & Garnett 2001; O'Malley 2006). In the non-breeding season, birds can disperse widely (Garnett et al. 2011), greatly increasing the possible range of this species.

Survey context

The desktop assessment identified a medium likelihood of encountering Gouldian Finch within the northern 240 km of the study area (i.e. north of MAKP 164), due to the potential presence of small, isolated patches of suitable nesting habitat and relatively few proximate records.

The SREBA species' distribution model indicates a few small isolated patches of moderate probability of occurrence (NTG 2023), which correspond to areas that support *E. leucophloia*, with remaining areas considered to have a low probability of the species occurring – see inset on Figure 5-6. This pattern may be extrapolated to the rest of the study area, such that areas containing favoured nesting and food species are considered to have a low probability of occurrence. Gouldian Finch are not expected to occur south of MAKP 74 because SREBA and land type datasets indicate that suitable nesting habitat does not occur within or adjacent to the study area. The potential for Gouldian Finch to occur at the north end of the study area is supported by a single recent record (2021) of three Gouldian Finch, 17 km north-east of MAKP 24 (Figure 5-6).

The SREBA dataset (Young et al. 2022) has been used to estimate the occurrence of potential nesting habitat within the study area and surrounds (specifically, BVG 8 – Snappy Gum low open woodland), because it is the most recent and finest-scale vegetation dataset for the region. Areas south of the SREBA survey extent are considered outside the current species' distribution, and the widespread presence of clay (downs) plains in that area is not considered suitable habitat for the species.

Survey methodology

The field survey for Gouldian Finch habitat focused on the northern 150 km of the study area and aimed to identify potential priority breeding habitat, which for this region comprises of patches of Snappy Gum (*Eucalyptus leucophloia*) supporting suitable nesting hollows. Occurrences of Variably-barked Bloodwood (*Corymbia dichromophloia*), or other smooth-barked Eucalyptus, were also checked and mapped if suitable hollow bearing trees are identified.

Where patches of potential nesting habitat were identified, a Gouldian Finch habitat check was conducted. The assessment recorded structural attributes relevant to nesting suitability, including landform; habitat type; nesting tree species, density and height; and the density of single-stem and multi-stem (mallee-form) trunks.

Fire impact (e.g., scorch, regrowth and ground-layer condition) was also recorded, along with observations of food resources, including annual and perennial grass species.

If hollow-bearing trees were identified during habitat checks, a targeted assessment of hollows was undertaken. This involved recording hollow characteristics, including tree species, live or dead status, hollow diameter, depth, height above ground and orientation/angle. Trees bearing hollows were also inspected for evidence of Gouldian Finch use, including nesting material and faecal matter.

Where suitable nesting habitat was identified, its spatial extent was mapped within the study area.

Results and discussion

The aerial survey supported the desktop assessment that suitable breeding habitat for the Gouldian Finch is unlikely to occur within, or adjacent to, most of the study area. The survey included a total of 31 Snappy Gum (*Eucalyptus leucophloi*a) hollow check sites (6 ground sites and 25 aerial sites) and 48 Variably-barked Bloodwood (*Corymbia dichromophloia*) hollow check sites (8 ground sites and 40 aerial sites).

Whilst patches of Snappy Gum and Variably-barked Bloodwood woodland were recorded in the northern end of the study area (Snappy Gum open woodlands shown in Figure 5-6), patches were scattered and lacked hollow characteristics consistent with the species' known nesting requirements (representative photographs provided at Figure 5-7 and Figure 5-8). No hollows assessed as suitable for breeding were identified during targeted habitat checks, or low elevation aerial checks. There were also no rocky hill habitats within, or adjacent to, the study area, which is known to be a preferred nesting habitat for Gouldian Finch when suitable hollow-bearing trees are present (and adequate close-by food and water sources).

No Gouldian Finches were recorded during the survey, and no evidence of recent presence (e.g. nesting material, faecal deposits or flock activity) was observed. However, detectability constraints associated with the survey design and the species' mobile nature mean that absence cannot be completely confirmed, particularly in areas where suitable habitat elements occur at low densities or in small, isolated patches.

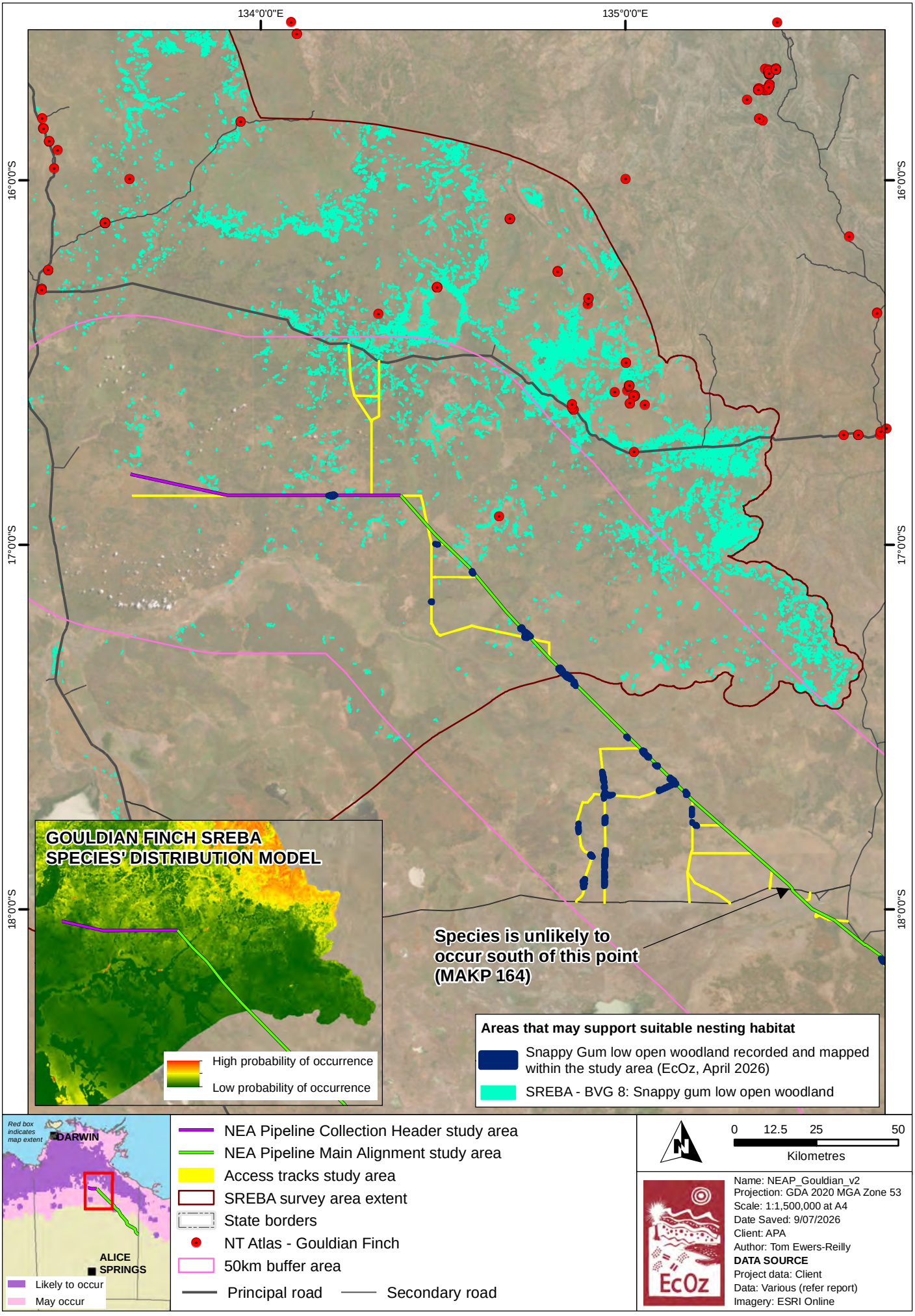

Figure 5-6. Map of Gouldian Finch records and vegetation types that may support nesting habitat

Figure 5-7. Representative aerial photographs of Snappy Gum patches within the study area

Site 418 – open mature Snappy Gum (some hollows present but no suitable nesting habitat observed)

Site 428 – open mature Snappy Gum (some hollows present but no suitable nesting habitat observed)

Site 707 – regrowth Snappy Gum after fire (no nesting habitat observed)

Figure 5-8. Representative ground photographs of Snappy Gum patches within the study area

5.2.4 Grey Falcon (*Falco hypoleucos*)

The Grey Falcon is listed as Vulnerable under the EPBC Act and TPWC Act. It is a medium-sized raptor (bird of prey) that is rare and occurs at low densities in arid and semi-arid regions of Australia. In the NT, most records are from the southern half of the territory (DEPWS 2021c).

Grey Falcon occurs in lightly-timbered lowland plains, particularly Acacia shrublands that are crossed by tree-lined watercourses (DoE, 2019), and have been observed hunting in treeless areas and frequenting grassland and open woodland (Schoenjahn 2018). The Grey Falcon is a highly transient species that will cross vast landscapes in search of suitable breeding habitat. The species occupies nests (often built by other bird species) in the tallest trees along watercourses, particularly River Red Gum (*Eucalyptus camaldulensis*) and Coolibah (*Eucalyptus coolabah*), and telecommunication towers (Falkenberg 2010; Schoenjahn 2013, 2018). The northernmost record of (known) breeding occurs near Daly Waters (Schoenjahn 2013).

Grey Falcons specialise as bird predators, with insects, mammals and reptiles adding to their diet (Schoenjahn 2013; DEPWS 2021c). The variability of climate and resources within arid and semi-arid regions – combined with the Grey Falcon's limited dietary flexibility – means that the species might appear in an area and then disappear again, possibly remaining absent for many years.

Survey context

The entire study area is considered within species' distribution. Suitable nesting habitat (typically the tallest trees on larger waterways) for the Grey Falcon may occur along major watercourses within the southern portion of the study area (19 major waterway crossings in total), which typically occur within downs (clay) plains and alluvial floodplains south of KP 168 – see red squares on Figure 5-9. Refer to Waterway Crossing Assessment (Appendix C) for aerial images and representative photographs of the major waterways.

Vegetation and land type datasets indicate that two known nesting tree species (both types of Coolibah) may occur in alluvial habitats within the study area (see Figure 5-9) – *Eucalyptus microtheca* (datasets indicate species is a dominant species in alluvial habitats) and *Eucalyptus coolabah* (datasets indicate only minor occurrence of species within land types intersected by the study area). It is noted that vegetation and land type datasets do not document *Eucalyptus camaldulensis* (a key nesting species for Grey Falcon) as a dominant or co-dominant species within the study area.

There are several recent records of Grey Falcon within 50 km of the study area, including some within or adjacent to the study area relatively close to Brunette Creek (it is unknown whether these records are nest sites or general observations) – see Figure 5-9.

Survey methodology

The survey focused on identifying any suitable nesting habitat in the study area (i.e. drainage lines with tall trees and identifying potential nest sites if such habitat was found). The surveyors also looked for any incidental sightings of the species.

During aerial surveys, all occurrences of tall trees along drainage lines were identified and recorded, and an aerial habitat check was conducted. Checks involved flying over suitable nesting trees, whilst observers searched for nests. If a nest was detected, a sign-check site was conducted.

Results and discussion

The aerial survey confirmed that potential nesting habitat for the Grey Falcon occurs primarily along major watercourses within the southern portion of the study area, particularly where drainage lines intersect alluvial floodplains supporting mature Coolibah (*Eucalyptus coolabah* / *E. microtheca*) and, in limited areas, other large riparian Eucalypts. These trees are the primary structural elements that support raptor nests in the landscape.

As detailed in the Waterway Crossing Survey Report (Appendix C), aerial inspections of major waterways and associated riparian vegetation confirmed the presence of suitable large trees at multiple crossings, and raptor

nests were commonly recorded within these habitats. The extent of major waterways has been mapped (using aerial imagery) within the study area at a nominal scale of 1:10,000 (refer to Section 4.1). This indicates that 13 waterways are crossed by the study area that support relatively tall trees (i.e. Coolibah) that may provide suitable Grey Falcon nesting habitat (locations shown on Figure 5-9). However, no Grey Falcon were observed during the survey. Some raptor nests were observed in Coolibah canopies; however, Square-tailed Kites and other raptor species were roosting in the nests at the time, therefore it was concluded that nest identity was not Grey Falcon. No direct evidence of active Grey Falcon nesting (e.g. confirmed occupancy or diagnostic field sign) was detected.

The entire study area is considered to support general foraging habitat for the species, which is widespread across the surrounding region. In general, Grey Falcon is more likely to be observed close to suitable nesting habitat or areas that support high numbers of prey species – which is expected to be limited to larger waterways that support tall emergent trees species, and wetland features such as swamps and closed depressions.

Given the species' reliance on large, long-lived riparian trees for nesting and its capacity to use existing raptor nests, suitable nesting sites may be intermittently present but are likely to be sparsely distributed across the study area. While general foraging habitat is widespread, nesting habitat is the key constraint for construction impacts.

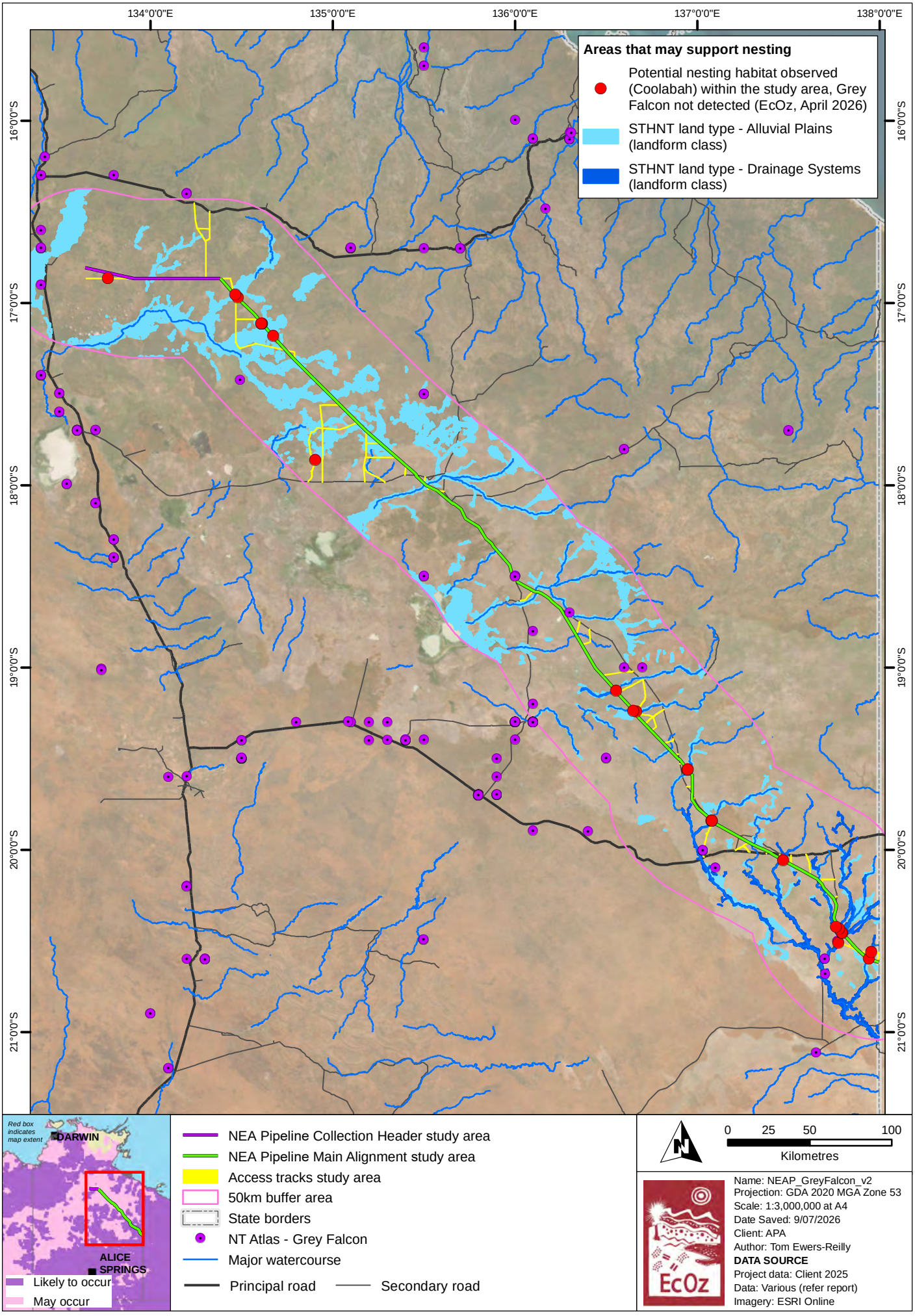

Figure 5-9. Map of Grey Falcon NT Atlas records and areas of preferred nesting habitat

5.2.5 Painted Honeyeater (*Grantiella picta*)

The Painted Honeyeater is listed as Vulnerable under the EPBC Act and TPWC Act. It is a black, white and yellow medium-sized honeyeater that has a highly-specialised diet, relying mostly on Mistletoe fruit. The Painted Honeyeater shows a preference for Mistletoe of the genus *Amyema*, with some consumption of nectar and insects (DAWE 2021). The species breeds in south-eastern Australia, dispersing into semi-arid and northern regions in the non-breeding season, which is thought to follow the fruiting season of Mistletoe (Garnett et al. 2011). While the species is widespread, it occurs in low numbers (DAWE 2021; DEPWS 2021d).

In the NT, Painted Honeyeaters have been observed between May and November, with most records from the Barkly Tableland (DEPWS 2021d). There is no documented evidence of Painted Honeyeaters breeding in the NT. Preferred habitat of this species utilised in the NT comprises *Acacia* and *Eucalyptus*-dominated woodlands and open forest, preferring habitats with more mature trees that host more Mistletoe (DEPWS 2021d).

Survey context

The entire study area occurs within the current species' distribution. There are sparse records of Painted Honeyeater in the region of the study area, shown on Figure 5-10. The species is considered to have a medium likelihood of occurrence within the study area due to a few scattered regional records and potential presence of feeding/nesting habitat.

Potential feeding/nesting habitat (high concentrations mistletoe) may occur within vegetation communities that support Acacia, Eucalyptus or Corymbia as the dominant species (these species can be mistletoe-hosts). According to review of land type and NVIS vegetation datasets, mistletoe-host species are most likely to occur within the following landform types – hills, low rises, plains, rises and sandplains shown on Figure 5-10. In general, it is assumed that likelihood of occurrence of Painted Honeyeater will increase with occurrence and density of mistletoe.

Survey methodology

The survey focused on identifying the presence and distribution of mistletoe (*Amyema* spp. and other parasitic Loranthaceae) within the study area as a proxy for potential foraging habitat for the Painted Honeyeater. Survey timing coincided with the start of the non-breeding season, when the species is most likely to occur in northern Australia and undertake broader seasonal movements in response to resource availability.

During aerial and ground surveys, all occurrences of mistletoe were recorded where visible in the canopy. Surveyors targeted woodland and open forest communities dominated by known mistletoe host genera, including Acacia, Eucalyptus and Corymbia. When mistletoe patches were identified, observers assessed patch size, apparent host species and overall density.

Surveyors also recorded any incidental observations of Painted Honeyeater (seen or heard), while traversing suitable habitat on ground. No targeted call playback or species-specific attractant methods were used, consistent with the species' low-density, highly mobile behaviour and the broader reconnaissance-style survey design. If large area of suitable habitat was identified, a targeted presence/absence surveys may be required if habitat avoidance strategies could not be adopted as a first option.

Results and discussion

The survey found very limited evidence of Mistletoe (*Amyema* spp. and related taxa) within the study area, with only sparse and scattered occurrences recorded during aerial and ground checks. Observed occurrences were of isolated individuals or small patches associated with scattered eucalypts and acacias, and no areas of concentrated mistletoe abundance were identified. No Painted Honeyeater were observed during the survey, and no signs of localised feeding activity or concentration areas were detected.

Given the species' strong reliance on mistletoe and the very low abundance of mistletoe recorded, the study area is considered to provide limited suitable foraging or transient habitat. As a result, the likelihood of occurrence of the Painted Honeyeater in the study area is assessed as low.

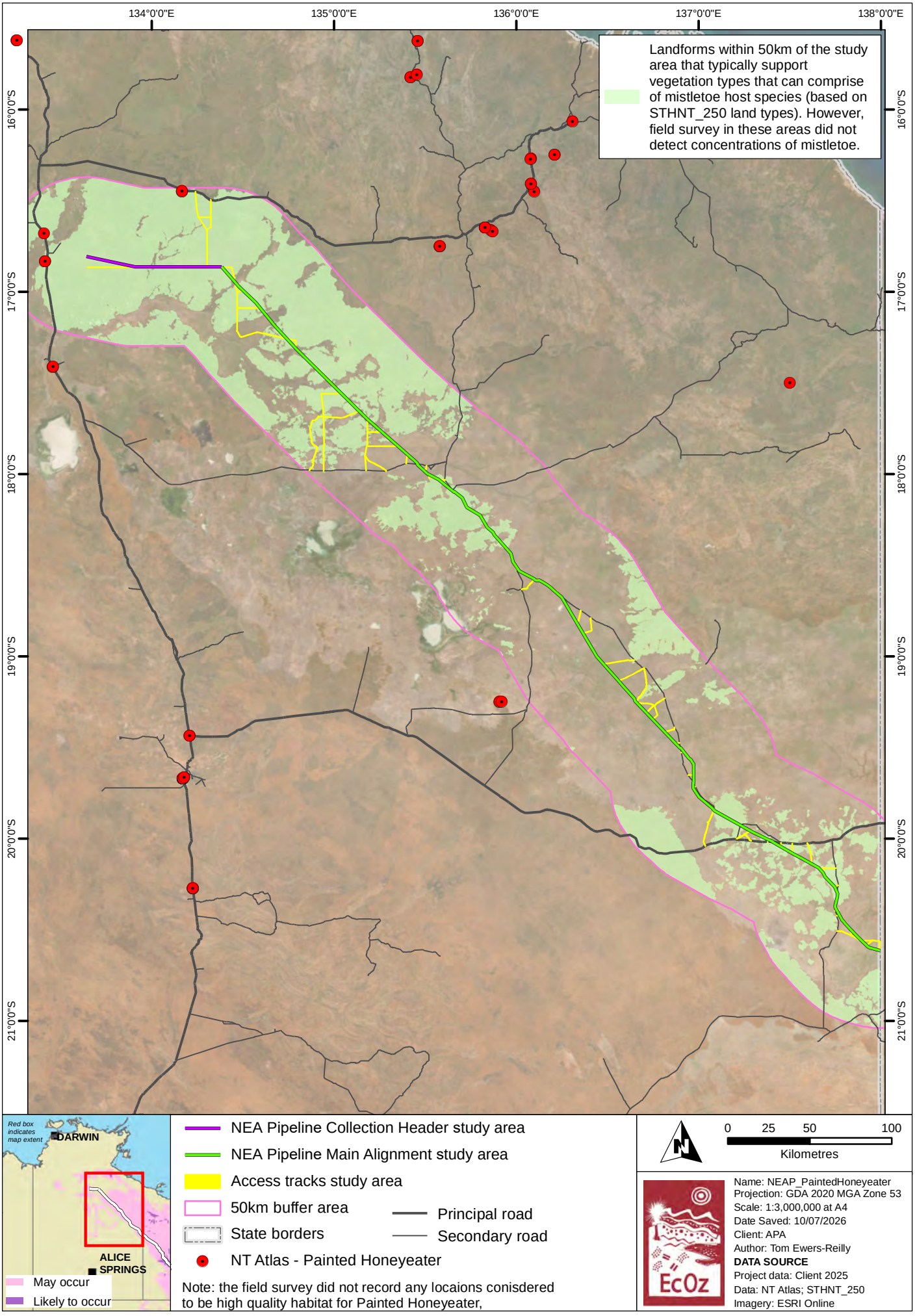

Figure 5-10. Map of Painted Honeyeater NT Atlas records and land types that were considered to potentially support suitable feeding/nesting habitat

5.2.6 Northern Blue-tongued Skink (*Tiliqua scincoides intermedia*)

The Northern Blue-tongued Skink is listed as Critically Endangered under the EPBC Act and Data Deficient under the TPWC Act. It is a large, robust, short-limbed skink (DCCEEW 2023). The sub-species is primarily nocturnal, active year-round, and consumes a wide range of plant and animal food. Home ranges average 4 ha (range 2 to 12 ha), but only about two-thirds of that range are used intensively (Price-Rees et al. 2013).

Northern Blue-tongued Skink can occur in a wide variety of ecosystems (DCCEEW 2023); however, most – but not all – detections have occurred near seasonal or permanent water (Shea, 1992). The sub-species spends most of its time in small, fragmented patches of habitat that offer cooler moister conditions, with higher grass and more leaf-litter cover (DCCEEW 2023). Current conservation advice for the sub-species states that habitat critical to the survival of Northern Blue-tongued Skink are areas of dense vegetation that provide cool and moist conditions (DCCEEW 2023). These areas provide the species with the resources it requires for persistence – i.e. food, water and protection from environmental exposure and predation (DCCEEW 2023).

The Northern Blue-tongued Skink is primarily threatened by the invasive Cane Toad because it is highly susceptible to Cane Toad toxin and does not learn to avoid Cane Toads after toxic encounters (Price-Rees et al. 2010). The study area occurs on the southern edge of the existing Cane Toad distribution.

Survey context

The northern section of the study area – entire Collection Header and between MAKP 0 to MAKP 137 – falls within the known distribution of Northern Blue-tongued Skink. This corresponds with patches of suitable habitat being present within lateritic plains and rises – see Figure 5-11. Within these areas, the sub-species is most likely to be found in areas with dense ground-layer protection, such as vegetation, leaf litter and logs, and proximate to water. It is considered unlikely for the sub-species to occur south of MAKP 137 due to the absence of critical habitat and being outside the sub-species' distribution.

A targeted survey was undertaken for the Northern Blue-tongued Skink in 2024 for the proposed Sturt Plateau Pipeline which is located immediately west of the northern end of the NEA Pipeline. That survey did not detect the sub-species. However, as can be seen on Figure 5-11, there are records of Northern Blue-tongued Skink within 50 km of the northern end of the study area – including three records (2012 to 2014) that are 35 km south-west of MAKP 74 and one record (2020) near Dunmarra Roadhouse that is 27 km north-west of CHKP 0.

Survey methodology

A habitat-based assessment was undertaken to identify potential refuge habitat for the Northern Blue-tongued Skink within the northern section of the study area (MAKP 0 to MAKP 137), which falls within the species' known distribution. The approach was based on identifying structurally-complex vegetation and moist micro-habitats considered likely to provide shelter, foraging resources and thermal refuge for the species.

Refuge habitat was defined as areas supporting dense ground and mid-storey vegetation, high litter accumulation, and/or increased soil moisture. This included mapped Bullwaddy (*Macropteranthes kekwickii*) woodlands and Lancewood–Bullwaddy associations, dense woodland or shrubland communities, and wet or seasonally-inundated landforms such as drainage lines and swamps.

Refuge habitat mapping was undertaken using SREBA vegetation mapping and land type datasets, supported by aerial imagery interpretation and helicopter-based field verification. Structural attributes relevant to refuge suitability were assessed at a landscape scale – including vegetation density, canopy closure, proximity to drainage features, and observable indicators of moisture retention where visible.

All incidental fauna observations were recorded during aerial and ground-based surveys. No targeted trapping or species-specific detection methods were undertaken due to the species' cryptic behaviour and the reconnaissance-level scope of the survey.

Results and discussion

Refuge habitat for the Northern Blue-tongued Skink was identified in a patchy, but widespread distribution across the northern portion of the study area (CHKP 0 to MAKP 137). Key areas included Bullwaddy-dominated vegetation communities, mixed-structure woodlands, and drainage-associated landforms – including minor drainages, swamps and seasonally-moist depressions. These areas are considered to provide the highest likelihood of supporting the species due to their greater structural complexity and potential for cooler, moister microclimates.

Northern Blue-tongued Skinks were not incidentally observed during aerial or ground-based habitat surveys. Given the species' cryptic behaviour, low detectability and reliance on discrete shelter sites within structurally-complex vegetation, absence of observations is not considered evidence of absence.

SREBA and land type datasets have been used to depict areas that many support potential refuge habitat for the species within the region surrounding the study area due to presence of dense vegetation and/or wet-alluvial based landforms, these include:

- SREBA – BVG 2, 3, 5, 6, 9, 10, 15, 16, 18 and 19 (refer to Table 2-3 for summary description)
- Land types – bt2, bt2a and p1a (refer to Table 3-1 for summary description)

Based on the SREBA vegetation mapping detailed in Section 2.4.3, there is 3,219 ha of refugia habitat within the study area (as mapped by EcOz during the field survey), compared to 1,113,738 ha of such habitat within a 50 km buffer within the SREBA extent alone (which only covers about two-thirds of the expected extent of Northern Blue-tonged Skink habitat intersected by the study area). From these findings, it is concluded that:

- Across the region, potential refuge habitat is common and widespread; it is not restricted to study area.
- Within the study area north of MAKP 137, potential refuge habitat is present but is fragmented.
- Small patches of refuge habitat (such as Bullwaddy patches) may provide local islands of habitat, therefore avoiding impacts to those features will minimise impacts to the species (if those areas are indeed used by the species as refuge habitat).

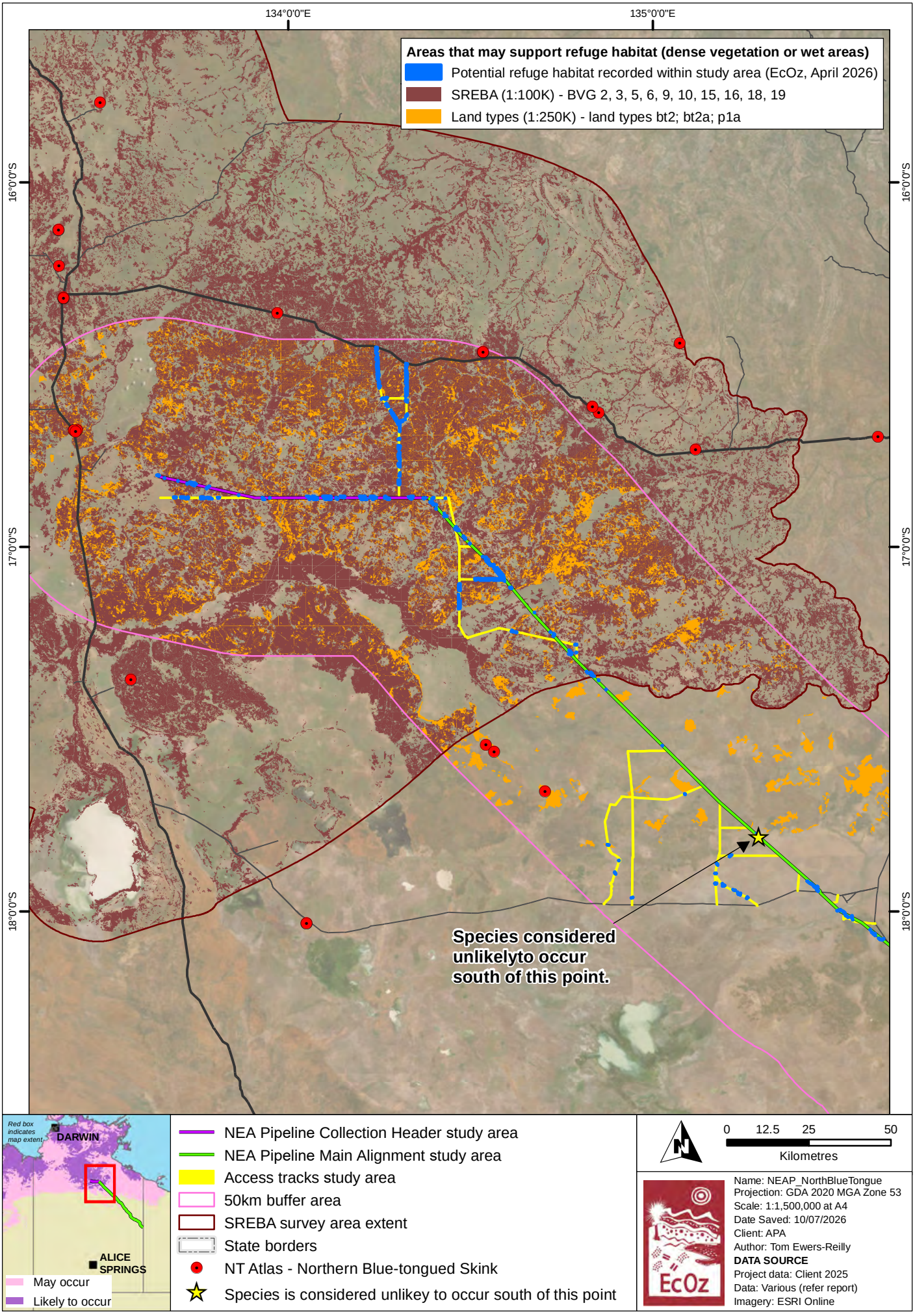

Figure 5-11. Map of Northern Blue-tongued Skink NT Atlas records and areas of potential refuge habitat

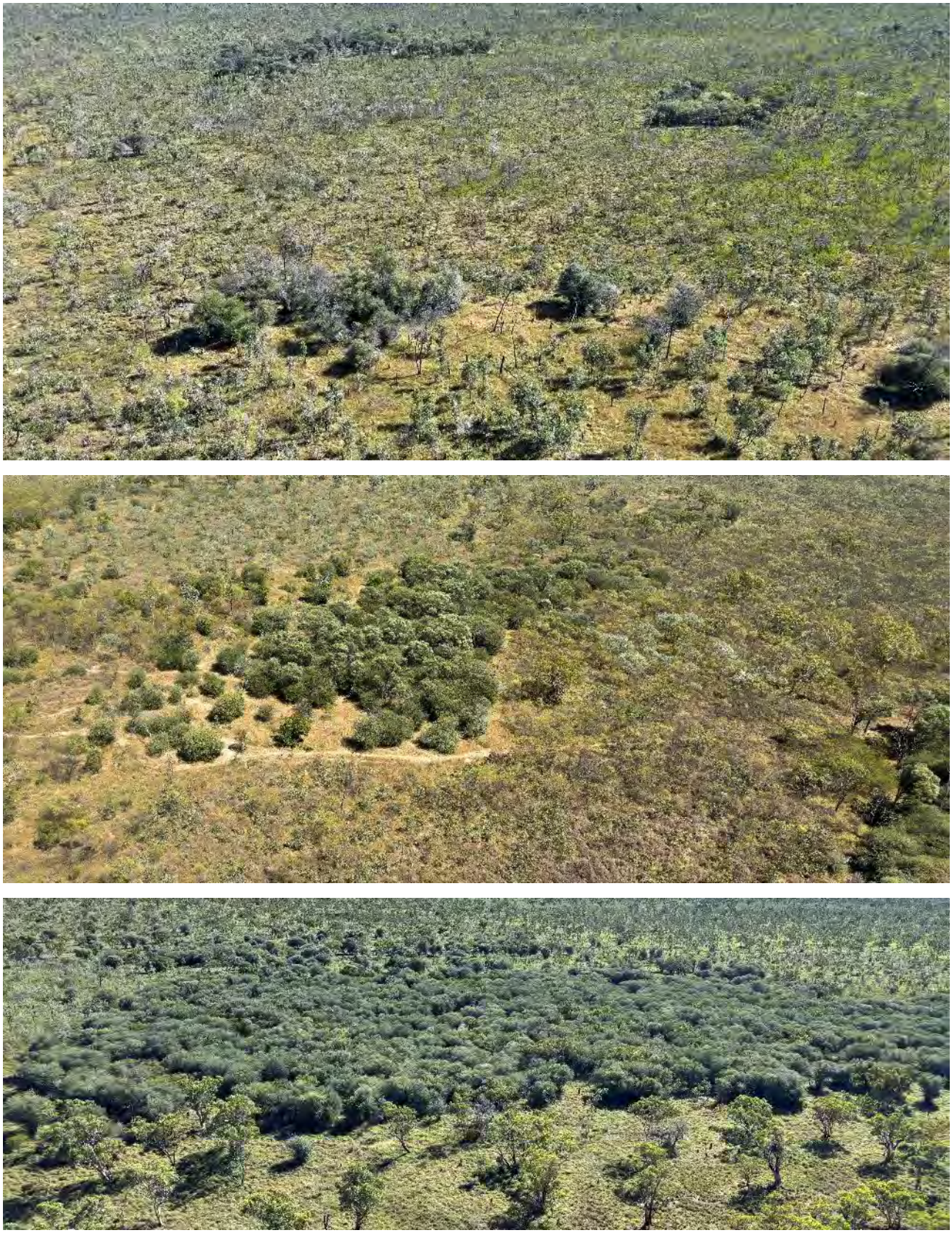

Figure 5-12. Example photographs of isolated patches of Bullwaddy that may be refuge areas for Northern Blue-tongued Skink within the study area

Figure 5-13. Example photographs of extensive areas of Bullwaddy and Bullwaddy-Lancewood that be provide potential refuge habitat for Northern Blue-tongued Skink

5.3 Revised threatened species assessment

Based on the habitat suitability survey that was undertaken in the field, the threatened species likelihood of occurrence assessment that was undertaken in Section 5.1 was updated and is presented in Table 5-4.

Table 5-4. Revised threatened species' likelihood of occurrence based on field observations

Class	Name	EPBC	TPWC	Expected occurrence
High likelihood of occurrence				
REPTILE	Plains Death Adder *Acanthophis hawkei*	VU	VU	Not recorded during the field survey. Many relevant NT Atlas records*. Potential to occur in black soil / clay (downs) plains (vertosols) – especially areas that have a high incidence of fissures/cracks. Most likely to be encountered within the Mitchell Grass Downs bioregion (i.e. south of MAKP 137); however, could occur anywhere where suitable habitat is present.
	Yellow-spotted Monitor *Varanus panoptes*	-	VU	Species was recorded during the survey. Many relevant NT Atlas records. Species most likely to be encountered within alluvial and clay (downs) plains, drainage systems and adjacent plains; however, could be present anywhere because the species occurs in a wide variety of habitat and landforms. Not expected to occur south of MAKP 410 (outside of species distribution).
Medium likelihood of occurrence				
BIRD	Grey Falcon *Falco hypoleucos*	VU	VU	Not recorded during the field survey. A few relevant NT Atlas records. Entire study area is considered within species' distribution. The study area crosses 13 major waterways (all south of MAKP 168); these areas may support suitable nesting habitat (typically the tallest Coolibah trees on larger waterways and surrounding ephemeral swamps). Potential foraging habitat present throughout the entire study area.
REPTILE	Northern Blue-tongued Skink *Tiliqua scincoides intermedia*	CR	-	Not recorded during the field survey. A few NT Atlas records in the region. Northern section of study area is on the southern edge of species' distribution. Areas with dense ground vegetation – particularly near water – in the northern portion of the study area may provide suitable refuge habitat – these include Bullwaddy, Bullwaddy-Lancewood, ephemeral swamps and drainages.
Low likelihood of occurrence[6]				
BIRD	Gouldian Finch *Chloebia gouldiae*	EN	VU	Not recorded during the field survey. A few NT Atlas records in the region (but appears uncommon). The field survey confirmed that preferred areas of nesting habitat (Snappy Gum with suitable hollows) is uncommon within the study area and surrounds.
BIRS	Painted Honeyeater *Grantiella picta*	VU	VU	Not recorded during the field survey. A few NT Atlas records in the region (but appears uncommon). Entire study area occurs within species' distribution. However, the field survey confirmed that potential feeding/nesting habitat (high concentrations mistletoe) is not present within the study area.

CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened.

** 'Relevant records' are those that are recent (last few decades) and from habitats likely to be present within the study area.*

[6] This threatened species validation table only include species that were subject to targeted field-based habitat suitability assessments. There are numerous other species considered to have a low likelihood of occurrence (refer to Table 5-1), all of which are confirmed as low likelihood based on survey habitat assessments.

6 MIGRATORY SPECIES

Australia is a signatory to three bilateral migratory bird agreements with Japan, China and the Republic of Kora, as well as the Bonn Convention. These agreements provide a basis for cooperation on activities for the conservation of migratory animals that move between each country. Species listed on the annexes of these agreements are a Matter of National Environmental Significance (MNES) under the *EPBC Act* as listed migratory species. Generally, a project will not have a significant impact on migratory species unless there is important habitat for, and/or significant occurrences of, migratory species.

The EPBC Protected Matters Search Tool report (see Appendix A) identified the possibility of migratory species protected under international agreements occurring within the region. This includes seven threatened migratory species which are assessed in Section 5 as having a low likelihood of occurrence within the study area. To assess the likelihood of the remaining migratory species from the EPBC PMST report occurring within the study area, the same procedure that was applied for threatened species was used (see Section 5). The results are presented in Table 6-1.

Table 6-1. Migratory species 'likelihood of occurrence' assessment summary

Likelihood	Species	Justification
Migratory terrestrial species		
HIGH	Fork-tailed Swift (*Apus pacificus*)	Regularly recorded throughout Australia
LOW	Red-rumped Swallow (*Cecropis daurica)*	Vagrant in Australia, known from only a few, widespread records in the NT.
	Barn Swallow (*Hirundo rustica*)	
	Oriental Cuckoo (*Cuculus optatus*)	Well outside known distribution
	Grey Wagtail (*Motacilla cinerea*)	Vagrant in Australia, known from only a few, widespread records in the NT.
	Yellow Wagtail (*Motacilla flava*)	Locally-common visitor near the coast in the Top End, vagrant elsewhere.
Migratory wetland species		
LOW	Oriental Reed-warbler (*Acrocephalus orientalis)*	Significant wetland features do not occur within the study area. There are some minor wetland habitats that are subject to seasonal inundation within the study area (most are not intersected by the Rev 1.0 of the NEA pipeline). If individual members of some migratory species were to seasonally utilise this habitat, this occurrence is expected to be for a short period and in low abundances. Additionally, any migratory species that could utilise habitat within the study area would be expected to preferentially utilise the larger, more suitable wetland areas in the region.
	Common Sandpiper (*Actitis hypoleucos*)	
	Pectoral Sandpiper (*Calidris melanotos*)	
	Oriental Plover (*Charadrius veredus*)	
	Oriental Pratincole (*Glareola maldivarum*)	

The likelihood of occurrence assessment summarised in Table 6-1 identified one species of migratory bird that with a high likelihood of being present in the study area – the Fork-tailed Swift (*Apus pacificus*). This species occurs in Australia between October and April as a non-breeding migrant only (Menkhorst et al. 2017). Exclusively aerial whilst in Australia, the species is recorded over a wide range of habitats including all terrestrial areas (DoE 2015b). Records coincide with the major road network for most of the NT, with the highest concentration within the greater Darwin area. This therefore means that the Fork-tailed Swift could occasionally occur in the airspace above the project.

The aerial field surveys included incidental observations of migratory species. All incidental sightings of relevant species and suitable habitat were recorded where encountered. No significant habitat for migratory species was identified within the study area. The minor wetland features present (including small swamps,

drainage depressions and seasonally inundated areas) are limited in extent, highly ephemeral, and do not constitute important habitat for listed migratory species at a local or regional scale.

Where present, these wetland features may support short-term or opportunistic use by highly mobile migratory wetland birds; however, such use is expected to be minimal given the lack of permanent water and the surrounding land types.

Overall, the study area is not considered to contain habitat features of significance for migratory species listed under the EPBC Act. However, during the field survey there were expanses of inundated floodplains, at least 30 km to the west (downstream) of the study area, some of which supported large flocks of waterbirds – see, e.g. Figure 6-1.

Figure 6-1. Photograph of waterbird congregation on shores of Lake Sylvester, located approximately 30 km west (downstream) of the study area

7 OTHER SIGNIFICANT SPECIES

Near Threatened[7] or Data Deficient[8] species are known to occur in the region of the study area. Such species are typically only included in risk assessments for project approvals if they have a restricted range (because those species have a much higher potential to be significantly impacted if a project footprint overlaps a population or occurrence). Subsequently, only species that have restricted ranges require consideration for project approvals.

7.1 Near Threatened species

NT Atlas records indicate there are 50 Near Threatened species within 50 km of the study area (Appendix F). Only one of these species is considered to have a restricted range – Carpentarian Pseudantechinus (*Pseudantechinus mimulus*) – however, this species only occurs within rugged rocky habitat, which is not present within, or adjacent to, the study area.

7.2 Data Deficient species

NT Atlas records indicate there are 74 Data Deficient species within 50 km of the study area (Appendix G). Only one of these species is considered to have a restricted range – *Digitaria cowiei* (a tussock grass).

Little is known about specific habitat preferences for *Digitaria cowiei*. Records indicate occurrence within lateritic plains and rises (which is a widespread land type in the region). Therefore, it appears that the species does not occur within 'atypical' habitat types that are typically associated with restricted-range species (such as rocky ranges or waterholes). The closest record to the study area is 40 km north of CHKP 73 (Collection Header Alignment). There are also scattered records of this species across the region spanning 400 km east-west, indicating that this species may not have a true restricted range and may instead be under-collected (hence the current Data Deficient listing). Subsequently, no further assessment of *Digitaria cowiei* is warranted.

7.3 Restricted-range species

In addition to the assessment above, the NT Herbarium was also contacted to provide advice on restricted-range flora species known to occur within the Sites of Botanical Significance (SOBS) intersected by the study area (see Section 2.3). The NT Herbarium confirmed there are no threatened or highly-significant flora species of interest in those areas; however, there are a number of significant (non-threatened) species associated with these SOBS that would be worth documenting if encountered along the pipeline alignment study area, particularly those with associations with permanent/semi-permanent waterholes or swamps (e.g. for *Nymphaea georginae*). Species of interest and general advice for each species are provided in Table 7-1.

It is noted that two SOBS are intersected by proposed access routes: Buchanan Rises (site # 19-6-1) and Connells Lagoon (site # 18-6-1); however, because these tracks are currently well-established and do not need to be widened, field assessment at these locations was not undertaken as potential for impact to vegetation is considered to be inherently low.

[7] A Near Threatened species when it is not classified in one of the above threatened categories, but it is close or likely to be in a threatened category soon.

[8] A Data Deficient (DD) species is when there is not enough information to make a direct, or indirect, assessment of its risk of extinction based on distribution and/or population. DD is not a category of threatened species, but DD species should not be assumed to be safe. A species in this category may be well studied and well known, but there is not enough specific data on numbers and distribution. Species in this category need more information and future research may show that they need to be classified as threatened.

Table 7-1. Flora species of interest within SOBS within the study area

SOBS	MAKP	Significant flora (TPWC status*)	Advice from NT Herbarium
Brunette Creek Waterholes (site # 18-5-1)	267 - 269	*Austrobryonia argillicola* (NT)	Of interest if encountered
		Corchorus pascuorum (DD)	Likely LC at the national scale
		Goodenia nigrescens (DD)	'Barkly Region' restricted species of interest
		Iotasperma sessilifolium (DD)	Possibly should be LC rather than DD
		Nymphaea georginae (NT)	Survey recommended if intersecting permanent / semi-permanent waterholes
Lorne Creek Waterholes (site # 19-6-2)	446 - 448	*Nymphaea georginae* (NT)	Survey recommended if intersecting permanent / semi-permanent waterholes
James River Waterholes (site # 20-6-2)	494 - 496	*Commelina tricarinata* (DD)	Widespread, but under collected
		Corchorus pascuorum (DD)	Likely LC at the national scale
		Fimbristylis sp. Connells Lagoon (NT)	'Barkly Region' restricted species of interest
		Ixiochlamys integerrima (NT)	Of interest if encountered
		Nymphaea georginae (NT)	Survey recommended if intersecting permanent / semi-permanent waterholes
		Rotala tripartita (NT)	Widespread, but under collected
Georgina River (site # 20-6-1)	554 - 557	*Acacia chisholmii* (NT)	Only recorded from 2 sites in the NT. Priority for collection if encountered; some recording of abundance to inform possible further survey effort would be beneficial.
		Astrebla lappacea (DD)	Widespread, but under collected
		Cenchrus basedowii (DD)	Widespread – likely to be LC at national scale
		Commelina tricarinata (DD)	Widespread, but under collected
		Corchorus pascuorum (DD)	Likely to be LC at national scale
		Cynanchum brevipedicellatum (DD)	Likely to be LC at national scale
		Ixiochlamys integerrima (NT)	Of interest if encountered
		Iotasperma sessilifolium (DD)	Possibly should be LC rather than DD
		Iseilema calvum (DD)	Likely to be LC at national scale
		Mentha australis (NT) (DD)	Likely to be LC at national scale
		Polymeria calycina (DD)	Of interest, but unlikely to be threatened

Status key: NT – Near Threatened; DD – Data Deficient; LC – Least Concern

8 WEEDS

Some species of introduced flora are declared weeds under the NT *Weeds Management Act* because of the environmental and/or economic harm they can cause. Class A weeds are to be eradicated by landowners and occupiers. Class B weeds must have their growth and spread controlled by landowners and occupiers. The remaining introduced flora species are referred to as *environmental weeds*. The Commonwealth Government has also categorised some species as Weeds of National Significance (WoNS).

Within the region of the study area, weed distribution is often related to environmental disturbances caused by the construction of roads and tracks, cattle grazing and feral animals. Weeds are typically most prevalent on land under pastoral lease, with infestations generally concentrated around infrastructure such as water points, fence lines and tracks, and along the banks of watercourses where cattle and feral animals tend to congregate.

The study area lies within the *Tennant Creek Regional Weeds Strategy 2021-2026* (DEPWS, 2021a). That strategy focuses on the weeds that are most important (i.e. priority) to the region, categorising them as either:

- Category 1 – Priority weeds for eradication
- Category 2 – Priority weeds for strategic control (including eradication of outliers)
- Category 3 – Weeds of concern – prevent spread
- Category 4 – Hygiene or biosecurity weeds – prevent spread
- Category 5 – Alert weeds – eradication on detection.

A review of the NT Weed Branch weed dataset identified 14,025 records (75 species)[9] within a 50 km radius of the study area (records shown on Figure 8-1). Of these, 39 species are declared and/or considered priority species in the *Tennant Creek Regional Weeds Strategy 2021-2026* (see Table 8-1).

Most records occur within major watercourses and other alluvial habitats (lakes, swamps and floodplains). The most recorded priority species are Mesquite (*Prosopis pallida*), Prickly Acacia (*Vachellia nilotica*), Hyptis (*Mesosphaerum suaveolens*), Parkinsonia (*Parkinsonia aculeata*) and Rubber Bush (*Calotropis procera*), with a higher concentration of records in the central part of the study area between MPKP 137 and KP 364.

Table 8-1. Weed species relevant to the study area

Common name	Botanical name	Class*	WoNS	Category TCRWS**	Existing records***	Habitat
Athel Pine	*Tamarix aphylla*	A	Yes	2	33	Watercourses
Bellyache Bush	*Jatropha gossypiifolia*	A	Yes	1	15	Watercourses
Chinese Apple	*Ziziphus mauritiana*	A	No	-	1	Woodland, grassland, watercourses
Gamba Grass	*Andropogon gayanus*	A	Yes	1	26	Grassland, woodland
Mesquite	*Prosopis pallida*	A	Yes	1	2,132	Watercourses
Mesquite	*Prosopis velutina*	A	Yes	1	30	Grasslands, watercourses
Mimosa	*Mimosa pigra*	A	Yes	-	1	Watercourses, wetlands
Parthenium Weed	*Parthenium hysterophorus*	A	Yes	5	1	Watercourses, grassland, woodland
Prickly Acacia	*Vachellia nilotica*	A	Yes	1	1,220	Watercourses

[9] Weeds only; native species identified in the *Tennant Creek Regional Weeds Strategy 2021-2026* are excluded.

Common name	Botanical name	Class*	WoNS	Category TCRWS**	Existing records***	Habitat
Prickly Pear	*Opuntia puberula*	A	Yes	1	4	Woodland, shrubland, rocky slopes
Rope Cactus	*Cylindropuntia spp.*	A	Yes	1	0	Woodland, grassland
Rubber Vine	*Cryptostegia grandiflora*	A	Yes	1	0	Watercourses, woodland
Rubber Vine	*Cryptostegia madagascariensis*	A	No	-	7	Watercourses, forest
Thornapple	*Datura ferox*	A	No	-	1	Around infrastructure
Caltrop	*Tribulus cistoides*	B	No	4	0	Around infrastructure, sandy soils
Coffee Senna	*Senna occidentalis*	B	No	4	1	Around infrastructure, grassland, woodland
Flannel Weed	*Sida cordifolia*	B	No	-	3	Around infrastructure, grassland, woodland
Grader Grass	*Themeda quadrivalvis*	B	No	5	2	Woodland, grassland
Hyptis	*Hyptis capitata*	B	No	-	3	Around infrastructure, watercourses, woodland
Hyptis	*Mesosphaerum suaveolens*	B	No	-	129	Around infrastructure, grassland, woodland, watercourses
Khaki Weed	*Alternanthera pungens*	B	No	-	8	Around infrastructure, grassland
Mexican Poppy	*Argemone ochroleuca*	B	No	4	1	Watercourses, road/rail corridors
Mission Grass (perennial)	*Cenchrus polystachios*	B	No	-	11	Grassland, woodland
Mossman River Grass	*Cenchrus echinatus*	B	No	3	1	Grassland, woodland, watercourses
Neem	*Azadirachta indica*	B	No	2	24	Watercourses
Noogoora Burr	*Xanthium strumarium*	B	No	3	63	Watercourses
Paddy Lucerne	*Sida rhombifolia*	B	No	-	6	Around infrastructure, grassland, woodland
Parkinsonia	*Parkinsonia aculeata*	B	Yes	2	9,834	Watercourses, grassland, woodland
Rubber Bush	*Calotropis procera*	B	No	2	125	Watercourses, grassland, woodland
Siam Weed	*Chromolaena odorata*	B	Yes	5	0	Watercourses, disturbed areas
Sicklepod	*Senna obtusifolia*	B	No	4	3	Watercourses, woodland, disturbed areas

Common name	Botanical name	Class*	WoNS	Category TCRWS**	Existing records***	Habitat
Spiny-head Sida	*Sida acuta*	B	No	-	7	Woodlands, watercourses
Buffel Grass	*Cenchrus ciliaris*	Yes	No	3	16	Watercourses, grassland, woodland
Giant Rats Tail Grass	*Sporobolus natalensis*	-	No	5	0	Disturbed areas, grassland, woodland
Giant Rats Tail Grass	*Sporobolus pyramidalis*	-	No	5	1	Disturbed areas, grassland, woodland
Kapok	*Aerva javanica*	-	No	4	0	Roadsides, sandy / calcareous soils
Mission grass (annual)	*Cenchrus pedicellatus*	-	No	4	41 (with one additional record of *C. pedicellatus* subsp. *unispiculus*)	Grassland, woodland
Asbestos Grass	*Cenchrus basedowii*	Native	No	3	12	Grassland, woodland, shrubland
Mimosa Bush	*Vachellia farnesiana*	Native	No	3	11	Grassland, woodland, watercourses

** As per the NT Weed Management Act; ** TCRWS - Tennant Creek Regional Weeds Strategy 2021-2026 (DEPWS, 2021a); *** NT Atlas records 50km clip from study area*

8.1 Methodology

A targeted weed survey was conducted during the aerial survey and associated ground assessments. If a weed species was observed, data was recorded in accordance with the NT Weed Data Collection Guidelines.

The following attributes of any weed infestations were recorded in the ArcGIS Fieldmaps app:

- Landform
- Weed name
- ID confidence
- Date of record
- Coordinates
- Recorder
- Infestation size (i.e. 5 m^2, 20 m^2, 50 m^2, 100 m^2, >100 m^2)
- Infestation density (1 = Absent, no weeds of this species in the area; 2 = < 1%; very few, not many weeds; 3 = 1 – 10%; more than one or two isolate plants; 4 = 11 – 50%; Many plants, covering up to half the area; 5 = > 50%; Weed forms the dominant cover)

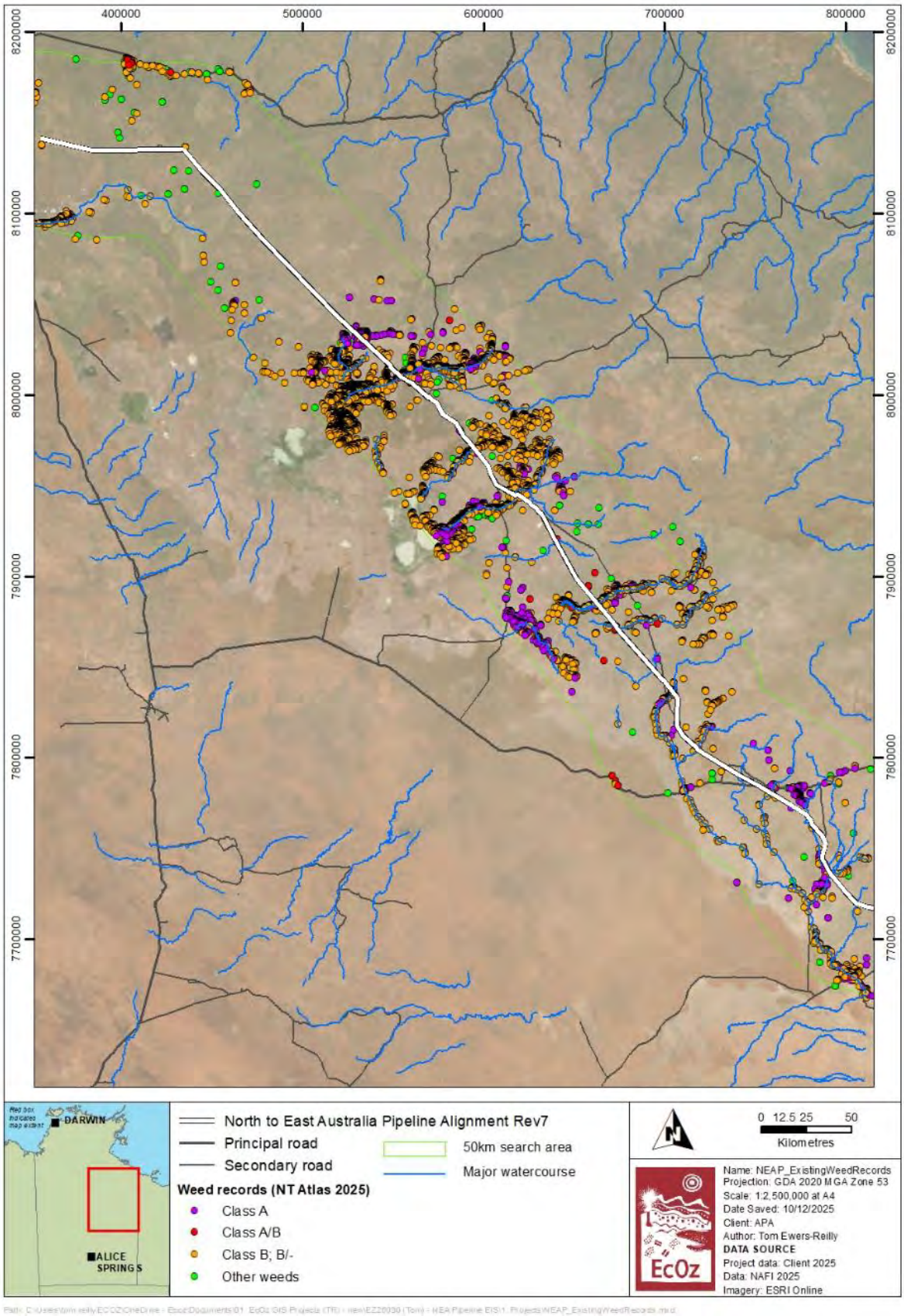

Figure 8-1. Map showing NT Atlas weed records within 50 km of the study area

8.2 Results

Weeds were recorded at 51 sites during the survey, comprising 9 different weed species (summarised Table 8-2; locations shown on Figure 8-2; dataset provided in Appendix H) – relatively few given the size of the study area. All species were identified with high confidence. The most recorded species were Buffel Grass (13 records), Parkinsonia (10 records) and Spiked Malvastrum (7 records). Other weeds recorded included Athel Pine, Rubber Bush, Mesquite, Noogoora Burr and Kapok. Mimosa Bush was also commonly encountered within the study area; however, site records have not been presented because this species is considered as a naturalised weed species present across northern and inland Australia. Example photographs of declared weeds recorded within the study area are provided in Figure 5-13.

Weed infestations were most concentrated in the southern portion of the study area, in the Mitchell Grass Downs bioregion, particularly within drainage systems and alluvial plains. Fewer infestations were recorded in the central section of the alignment, whilst the northern section supported scattered infestations associated with riparian areas and localised disturbance.

Woody weeds – particularly Parkinsonia, Mimosa Bush and Mesquite – were associated with riparian corridors and drainage features. Buffel Grass was at relatively low densities and occurred across a range of landforms and disturbance areas (access tracks and cattle) and established under tree and shrub canopies.

Recorded infestations were generally small to moderate in extent and variable in density, ranging from isolated plants to locally-dense infestations beneath mature trees and around drainage features.

Weed observations were limited to infestations visible during aerial surveys and intermittent ground checks and, therefore, should not be considered a complete inventory of weeds within the study area. The field survey confirmed the presence of several declared and environmentally-significant weed species within the study area, supporting the implementation of standard weed hygiene and management measures during project activities. Measures should include vehicle and machinery hygiene protocols, management of topsoil movement and rehabilitation practices to minimise weed spread and establishment in disturbed areas.

Table 8-2. Summary of weed data recorded during the field survey

Common name	Scientific name	Class*	WONS	Category TCRWS**	Number of site records***
Athel Pine	*Tamarix aphylla*	A	Yes	2	3
Buffel Grass	*Cenchrus ciliaris*	Yes	No	3	13
Kapok	*Aerva javanica*	No	No	4	6
Mesquite	*Prosopis pallida*	A	Yes	1	2
Noogoora Burr	*Xanthium strumarium*	B	No	3	1
Parkinsonia	*Parkinsonia aculeata*	B	Yes	2	12
Rubber Bush	*Calotropis procera*	B	No	2	4
Spiked Malvastrum	*Malvastrum americanum*	No	No	NA	7
Stylo	*Stylosanthes hamata*	No	No	NA	3

** As per the NT Weed Management Act; ** TCRWS - Tennant Creek Regional Weeds Strategy 2021-2026 (DEPWS, 2021a); *** Survey records EcOz April 2026, refer to Appendix H*

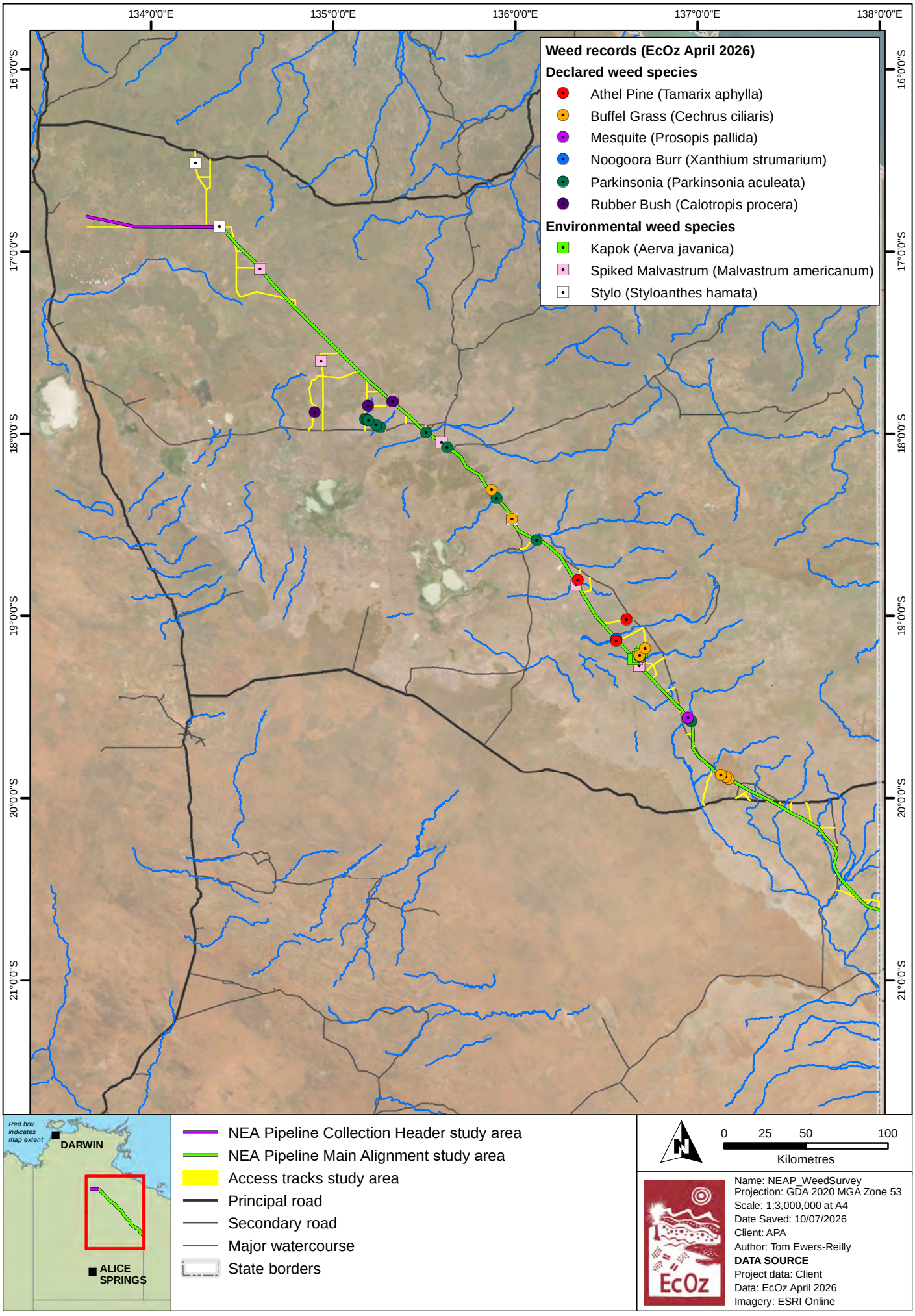

Figure 8-2. Map of weed species recorded during the field survey

Parkinsonia

Parkinsonia

Athel Pine

Athel Pine

Mesquite

Kapok

Noogoora Burr

Buffel Grass patches

Rubber Bush

Figure 8-3. Example photograph of weeds recorded during the field survey