



29 January 2025

John Morrell
Environment and Heritage
Planning and Technical Services Directorate

Dear John

Anketell Rd Upgrade *Leioproctus douglasiellus* and *Neopasiphae simplicior* Targeted Survey: Summary of Findings

Please find attached a report detailing targeted surveys for two Threatened bee species (Prendergast 2025) in relation to the Anketell Road Upgrade (Leath Road to Kwinana Freeway) Project. Here, I present a summary of the impetus, methods and results of the surveys.

Introduction

Two species of Threatened native short-tongued bee were selected for targeted work due to previous records in proximity to the Referral area for the project:

- *Neopasiphae simplicior*, which is listed as critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and endangered under the *Biodiversity Conservation Act 2016* (BC Act); and
- *Leioproctus douglasiellus*, which is listed as critically endangered under the EPBC Act and endangered under the BC Act.

The closest record of *Neopasiphae simplicior* to the Referral area is from Forrestdale Lake Nature Reserve (9 km to the northeast). When proposed for listing in 2009 (Threatened Species Scientific Committee 2008, Department of the Environment 2025b), *Neopasiphae simplicior* was known only from three locations, however, since then there has been a major increase in localities of records, spanning from Geraldton in the northwest to Israelite Bay in the southeast. The species has nevertheless undergone declines in its historic geographic distribution. The bulk of records are from around Perth on the Swan Coastal Plain (ALA 2024), an area that has undergone extensive and ongoing urbanisation. *N. simplicior* does not appear as specialised as *Leioproctus douglasiellus* in foraging habits but still has relatively few flowering species that it visits. It has been collected from the perennial herbs *Goodenia pulchella* and *Velleia* sp. (Goodeniaceae), and the annual herbs *Lobelia tenuior* (Campanulaceae), and *Angianthus preissianus* (Asteraceae), and recently, *Stylidium caespitosum* (Stylidiaceae).

The closest record of *Leioproctus douglasiellus* is from Jandakot Regional Park approximately 3 km northeast of the Referral area (ALA 2024). Furthermore, recent surveys by DBCA assisted by Dr Kit Prendergast in November - December 2024 have confirmed the species is still present in Forrestdale (9 km northeast of the Referral area). The species has a

very restricted geographic range (24.3 km², with an area of occupancy of only 0.2 km²). Moreover, *L. douglasiellus* appears to be highly specialised to collect pollen only from native flora in the family Goodeniaceae, and bee specimens have only been collected on two plant species: *Goodenia pulchella* (misnamed as *G. filiformis* in the Approved Conservation Advice for the species) and *Anthotium junciforme* (Threatened Species Scientific Committee 2013, Department of the Environment 2025a).

For both species, there is information available on preferred foraging plants as detailed above, however breeding habitat preferences remain largely unknown. Both species are believed to be ground-nesting but no nests of either *N. simplicior* or *L. douglasiellus* have been recorded to date.

The current study included targeted bee sampling in the field across spring and summer covering the phenological range of the bee species and their host plants. An assessment of likelihood of the two species was also provided based on the field survey and available information on the species' distribution and ecology.

Methods

Field sampling was conducted late November, early December 2023, late January, mid-February 2024, and late October 2024. Surveys were led by consulting bee specialist Dr Kit Prendergast, with assistance from Biota Environmental Sciences staff. Bees were collected via sweep-netting and identified by Dr Prendergast.

Sampling was conducted within or directly adjacent to the Referral area (see sampling site locations in Attachment A) and nearby reserves Jandakot Regional Park and Beeliar Regional Park, as well as Forrestdale Lake Nature Reserve; a known locality for both species.

Results

Neopasiphae simplicior was not recorded from five phases of sampling across its known active period. Based on previous records of *Neopasiphae simplicior* in the region, its more generalist diet and recent records across the southwest, it is considered to have low to moderate likelihood of occurrence within the Referral area. We would note that only one of the plant species the bee has previously been recorded from, *Lobelia tenuior*, occurs within the Referral area recorded from only one quadrat towards the western end of Referral area (Biota 2024), while it was recorded at four locations outside the Referral area near Jandakot Regional Park. There is a possibility that *N. simplicior* forages on other host species, given it has been recorded from representatives of a number of plant families and that if host plants occur within a kilometre of the Referral area, it may nest there. However, as nests have never been discovered, it is not possible to determine the suitability of substrate in the Referral area as nesting habitat for this species.

Leioproctus douglasiellus was not recorded and is assessed as having a low likelihood of occurrence, given few records, especially in recent times, and none of its host plants have been recorded in or around the Referral area. It also appears to prefer claypan habitat based on its previous records at Kenwick wetlands, Cannington and Forrestdale Lake; habitat that is not present within the Referral area. The same lack of information regarding nesting habitat of *N. simplicior* also applies to *L. douglasiellus*.

I trust the information provided here may adequately inform environmental impact assessment in relation to the Anketell Upgrade Project and the targeted bee species.

If you have any queries, please do not hesitate to contact me.

Yours sincerely,

Biota Environmental Sciences Pty Ltd

Dr Victoria Ford
Principal Zoologist

Attachments

Attachment A: Bee sampling sites in relation to the Referral area and contextual reserves.
Attachment B: Prendergast (2025) Anketell Road Upgrade (Leath Road to Kwinana Freeway) Project: Native Bee Surveys

References

ALA (2024). Atlas of Living Australia [WWW Document]. Database, . Retrieved from bie.ala.org.au.

Biota (2024). Anketell Road Upgrade Consolidated Biological Survey. Unpublished report prepared for Main Roads WA, March 2024, Biota Environmental Sciences, West Perth, WA.

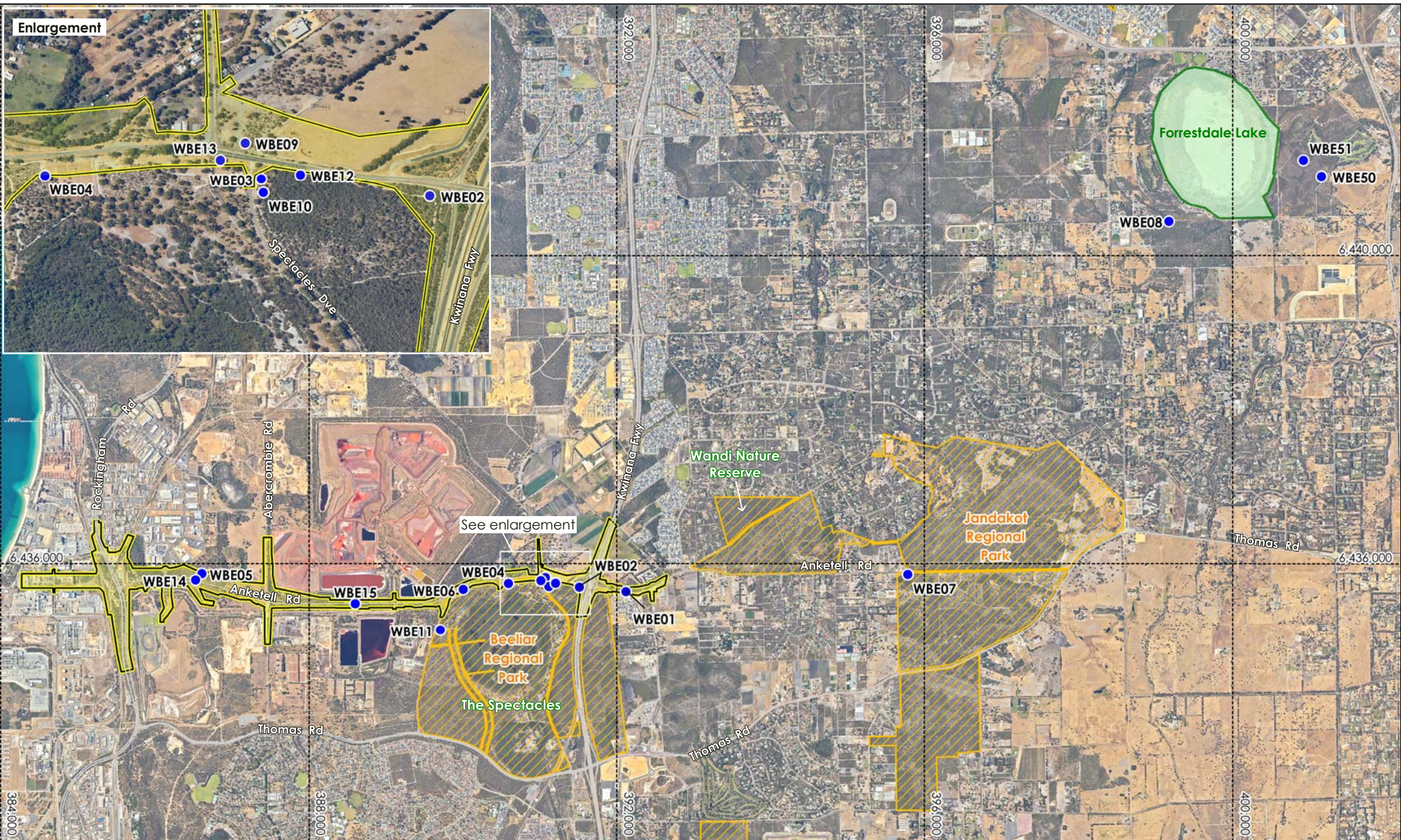
Department of the Environment (2025a). *Leioproctus douglasiellus* — a short tongued bee SPRAT Profile [WWW Document]. Retrieved from http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1060.

Department of the Environment (2025b). *Neopasiphae simplicior* — a native bee SPRAT Profile [WWW Document]. Department of the Environment, Canberra, . Retrieved from <https://www.environment.gov.au/sprat>.

Prendergast, K. (2025). Anketell Road Upgrade (Leath Road to Kwinana Freeway) Project: Native Bee Surveys. Unpublished Report Prepared for Main Roads Western Australia on Behalf of Biota Environmental Sciences, Perth, Western Australia.

Threatened Species Scientific Committee (2013). Approved Conservation Advice for *Leioproctus douglasiellus* (a short-tongued bee). Department of the Environment.

Threatened Species Scientific Committee (2008). Approved conservation advice for *Neopasiphae simplicior* (a short-tongued bee) under the *Environment Protection and Biodiversity Conservation Act 1999* . Department of the Environment, Water, Heritage and the Arts.



Location Map

Map Area

LEGEND

 Survey area	 Regional park (DBCA 2023)
● Sampling site location	 Forrestdale Lake Nature Reserve

N

0 2

kilometres

**Anketell Road Upgrade
(Leith Road to Kwinana Freeway)
Targeted Bee Sampling Sites**

Author: V Ford Drawn: M Robinson Job No.: 1803 Date: 21 Aug 2024 Revised: 14 Nov 2024 Projection: MGA Z50 (GDA2020) Scale: 1:62,500 @ A4

Anketell Road Upgrade (Leath Road to Kwinana Freeway) Project:

Native Bee Surveys

Prepared by Dr Kit Prendergast

On behalf of Biota Environmental Sciences

Peer review: Dr Victoria Ford

RevA January 2025



Leioproctus zephyr Prendergast 2022 © Dr Kit Prendergast

Introduction

Native bee surveys were conducted to document the assemblage of native bees in the vicinity of the Anketell Road (Leith Road to Kwinana Freeway) upgrade referral area (hereafter the 'Referral area'). Emphasis was placed on searching for two native bee species listed under both the WA *Biodiversity and Conservation Act 2016* (BC Act) and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act): *Leioproctus (Andrenopsis) douglasiellus* (Colletidae) and *Neopasiphae simplicior* (Colletidae).

Leioproctus douglasiellus is listed as critically endangered under the EPBC Act and endangered under the BC Act. At the time of listing (May 2013), it was believed to have a restricted geographic distribution (24.3 km², with an area of occupancy of only 0.2 km²). More recently, as of April 2024, there are 21 records of this species on the Atlas of Living Australia (ALA), ranging in the north from just south of Bullsbrook (9 records), to just north of Kelmscott (6 records), to the southernmost location in Forrestdale (6 records) (Fig. 2). Currently, the closest known record is from Jandakot Regional Park approximately 3 km northeast of the Referral area (ALA). Recent surveys by DBCA assisted by Dr Kit Prendergast in November - December 2024 have confirmed the species is still present in Forrestdale, and a healthy population exists in Brixton Street 7777 Wetlands in Kenwick (K. Prendergast & J. Cullity, pers. obs.) (K. Prendergast, 2024a). The records therefore fall within the urbanised region of the Swan Coastal Plain (Atlas of Living Australia, 2024a) (see also Fig. 2).

Since the first surveys documenting this species in 1954, the area of suitable habitat has declined considerably due to urban development on the Swan Coastal Plain (Threatened Species Scientific Committee, 2013). Moreover, *L. douglasiellus* appears to be highly specialised to collect pollen only from Goodeniaceae, and specimens have only been collected on two plant species: *Goodenia pulchella* (misnamed as *G. filiformis* in the *Approved Conservation Advice*) and *Anthotium junciforme* (Adamson, 2008; Threatened Species Scientific Committee, 2013). It should be noted that a species has been recorded in New South Wales which is very morphologically similar to *L. douglasiellus* (Batley, 2020, 2024). Further taxonomic work, and DNA barcoding, is required to determine if it is part of a cryptic species complex, or whether they are the same species (see also: (Houston & Prendergast, 2022; K. Prendergast & Dorey, 2023)).

Neopasiphae simplicior is listed as critically endangered under the EPBC Act and endangered under the BC Act. When proposed for listing (2009), it was known from three localities: Forrestdale Lake, Armadale Golf Course and at Cannington (Houston, 1994), having an extent and area of occupancy

of only 1 km² (Department of the Environment, 2018a, 2018b), with a previous population known from Cannington (Perth's southern suburbs) according to the species profile on the Department of Climate Change, Energy, the Environment and Water (DCCEEW) Species Profile and Threats Database. There has, however, been a major increase in recorded localities since then (see Figure 2). By 2019, there were five verified records on the ALA: a male collected north of Geraldton (Catalogue number E21498, date unknown); a specimen from the Isralite Bay region (Catalogue number WAM 7500, date unknown); two in the Perth region – Cannington Claypan (male, Catalogue number E7490, date unknown) and Armadale (Catalogue number WAM 13987 date unknown); and a male collected at Kooljerrinup Reserve, in Waroona (Catalogue number E70983, identified date 30th April 2010) (Atlas of Living Australia, 2024b). The latter two records, although published, are not readily available on public databases. Specimen WAM 13987 is a male *Neopasiphae simplicior* collected on 24th October 2010 in a blue bee bowl, located within *Banksia telmatiaea* wet heath at 400368m E, 6443938m N, at Bush Forever Site 342 by Dr Stephen Connell (EnviroWorks Consulting), as part of the 'Survey for Conservation Significant Bee Species Keane Road Strategic Link' and identified by Dr. Terry Houston (WA Museum) (Connell, 2012). *Goodenia pulchella* was present when the specimen was collected (Connell, 2012). *NatureMap* (Department of Parks and Wildlife 2007-2019) indicates eight more recent collections from between Port Gregory and Cape Arid. At Kooljerrinup Reserve two male specimens were collected patrolling along a sandy track on the 28th of November and 1st of December, 2008 (H. Adamson and T. Houston, pers. comm.). Since its listing, the species range has been found to be more extensive: there are two verified records were from Dr Terry Houston and C.A. Howard, recorded west of Esperance, and there are two records north of Geraldton. The most recent record is a photo of a male *N. simplicior* on *Stylidium caespitosum* – a new host record, taken November 2023 by Kate Brown and uploaded to iNaturalist (<https://www.inaturalist.org/observations/194971849>), also outside the species previously recorded range at the time of listing, located north of Albany. There is also an unconfirmed record from A. Hall in May 2023 near La Grange Dongata Reserve. As on April 2024, there were 48 records on the Atlas of Living Australia (Atlas of Living Australia, 2024b) . *N. simplicior* has nevertheless undergone declines in its historic geographic distribution. Recent intensive surveys at the type locality failed to relocate it (K. Prendergast, 2019), which is unsurprising given the extensive urban development around Cannington Claypan. The bulk of records are from around Perth on the Swan Coastal Plain (Atlas of Living Australia, 2024b), and area that had undergone extensive and ongoing urbanisation. *N. simplicior* has a limited number of flowering species that it visits, having been collected only from the perennial herbs *Goodenia pulchella* and *Velleia* sp. (Goodeniaceae), and the annual herbs *Lobelia tenuior* (Campanulaceae), and *Angianthus preissianus* (Asteraceae), and, recently, *Stylidium*

caespitosum (Stylidiaceae). Only males have been recorded on these two latter species, and which are therefore unlikely to serve as a pollen source (Houston, 2000). Clearing of bushland for residential and industrial development is considered to be a main threat to *N. simplicior* (Threatened Species Scientific Committee, 2008).

No recovery plan or threat abatement plan is in place for either of these species to ensure the persistence of this species (Department of the Environment, 2018a), and despite their threatened status, monitoring of either species has not occurred following the DEC Rare Native Bee Survey.

Records for both species provided by DBCA Species and Communities Program are provided in Table 1.

Table 1. Records provided by DBCA Species and Communities Program of *Leioproctus douglasiellus* and *Neopasiphae simplicior* (as of 11 Nov 2024)

Species	Date	Record type	N	Location
<i>Leioproctus douglasiellus</i>	1/01/1954	Caught	3	Pearce
<i>Leioproctus douglasiellus</i>	1/10/1954	Caught	1	Pearce
<i>Leioproctus douglasiellus</i>	14/01/1988	Caught	6	Forrestdale
				Kenwick Wetlands Nature
<i>Leioproctus douglasiellus</i>	9/11/2006	Caught	3	Reserve
<i>Leioproctus douglasiellus</i>	13/11/2006	Caught	1	Cannington
<i>Leioproctus douglasiellus</i>	22/11/2006	Caught	2	Forrestdale
<i>Leioproctus douglasiellus</i>	21/11/2017	Caught	1	Kenwick
<i>Neopasiphae simplicior</i>	16/10/1954	Caught	1	Cannington
<i>Neopasiphae simplicior</i>	21/10/1982	Caught	8	Mount Ragged
<i>Neopasiphae simplicior</i>	28/10/1987	Caught	8	Forrestdale
<i>Neopasiphae simplicior</i>	6/11/1987	Caught	4	Forrestdale
<i>Neopasiphae simplicior</i>	5/10/1998	Caught	1	Port Gregory
<i>Neopasiphae simplicior</i>	22/11/2006	Caught	2	Forrestdale
<i>Neopasiphae simplicior</i>	28/11/2008	Caught	1	Kooljerrenup Nature Reserve
<i>Neopasiphae simplicior</i>	1/12/2008	Caught	1	Kooljerrenup Nature Reserve
<i>Neopasiphae simplicior</i>	24/10/2010	Caught	1	Bushforever site 342, Keane Road
<i>Neopasiphae simplicior</i>	14/11/2018	Day sighting	25	Forrestdale
<i>Neopasiphae simplicior</i>	28/10/1987	Caught	8	Forrestdale

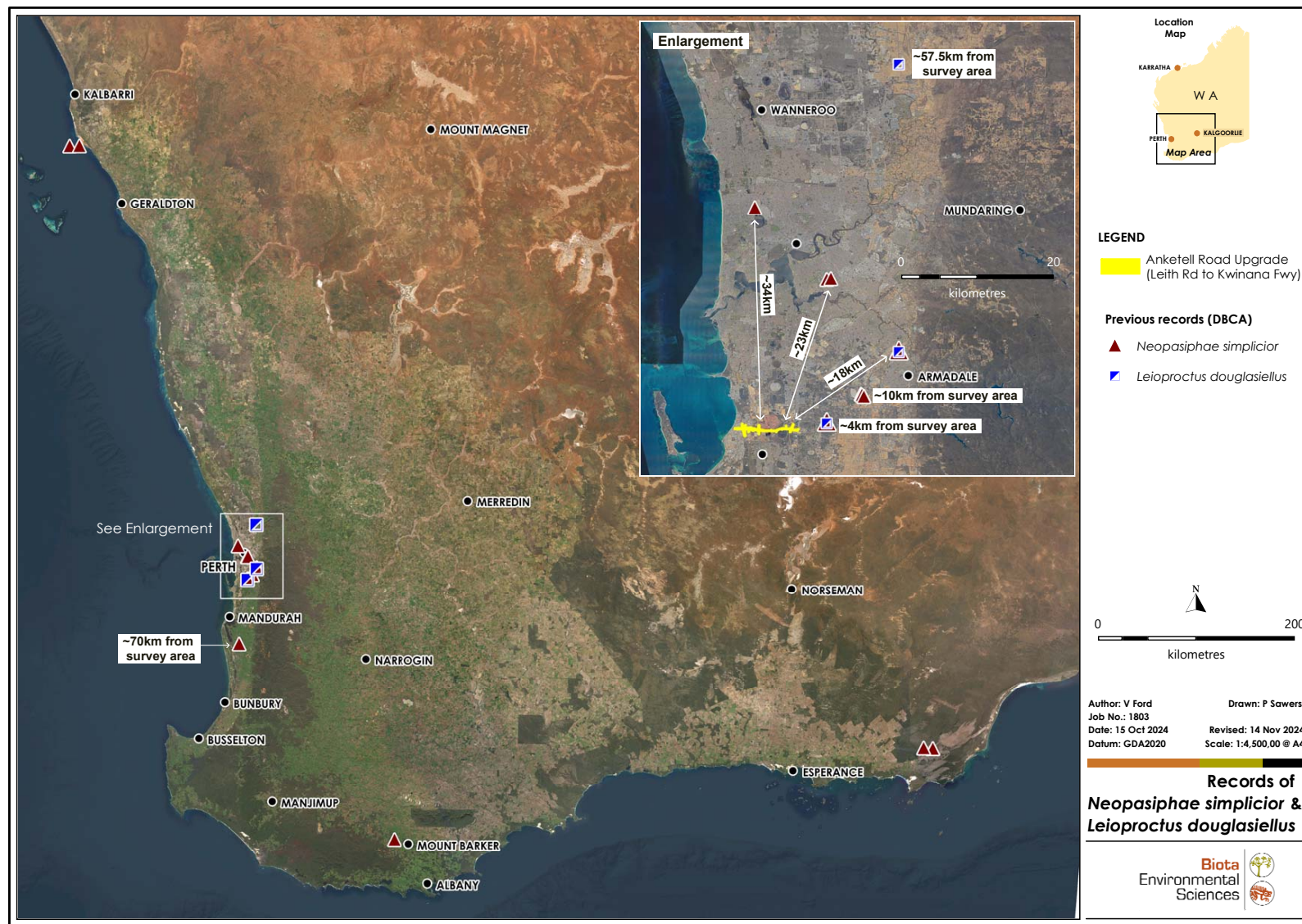


Figure 2. DBCA Threatened and Priority Fauna Database records of *Leioproctus douglasiellus* and *Neopasiphae simplicior*.

Impetus and scope of study

The aim of the current study was to conduct sampling for bees at two-monthly intervals, particularly targeting the listed threatened short-tongued bee species; *Neopasiphae simplicior* and *Leioproctus douglasiellus* and to assess the suitability of the habitat for these Endangered species. Sampling was conducted both within the Referral area and nearby reserves Jandakot Regional Park and Beeliar Regional Park at bimonthly intervals November 2023 to January 2024, and again in October 2024, thus covering the phenological range of the bee species and their host plants.

It should be noted that the conservation status of the vast majority of native bees is unknown as they have not been assessed nor subject to monitoring. These two species are the sole native bees in Australia, out of an estimated 2,000 species (Australian Government Department of the Environment and Energy, 2018) that are included on the EPBC list of threatened fauna species. However, given the specialisation of many native bee species, and their restricted distribution, and being subjected to habitat loss, fragmentation and degradation (Batley & Hogendoorn, 2009), others should be considered for listing. This is apparent for a recently described species of native bee, *Leioproctus zephyr*, which appears to be even more restricted in geographic range and host range than either of these listed species (K. S. Prendergast, 2022). Furthermore, there are many species that remain undescribed in the region (see for example: (K. Prendergast, 2022, 2023a, 2023b, 2023c, 2023d)), with their distribution and threatened status therefore unknown.

Methods

Surveys were conducted late November, early December 2023, late January 2024, mid February 2024, and late October 2024 (Table 2) to cover the active period of the target bee species. Areas in and adjacent to the Referral area were surveyed, as well as additional contextual sites on Jandakot Regional Park (WBE07), Forrestdale Lake Nature Reserve (WB0E8, WBE50, WBE51) and Beeliar Regional Park (WBE11) (The Spectacles) (Figure 1). Forrestdale Nature Reserve is located further from the project area (8.7 km north-east) but represents a known locality for *Neopasiphae simplicior*, providing both an opportunity to gauge activity and compare habitat to that within the project area. Site co-ordinates and descriptions are provided in Table 2.

Native bees were collected by a native bee expert, Dr Kit Prendergast, using targeted sweepnetting with a Biota staff member providing assistance. This method is the most effective at collecting the greatest abundance and diversity of native bees in this region (K. S. Prendergast, Menz, Dixon, & Bateman, 2020), and allows identification of floral hosts (K. S. Prendergast & Hogendoorn, 2021). Using a single, experienced surveyor prevented inter-observer bias, whereby differences between sites or surveys could be due to differences in surveyor expertise rather than actual differences. To minimise disturbance to the native bee fauna, species that were readily identified by sight or a voucher had been collected were recorded but not collected.

Species were pinned and labelled with location, co-ordinates, date of collection, collector, host plant, and given a unique identifier number. Species were identified by K.S. Prendergast using published descriptions, keys to genera (where available) (e.g. see references in (Houston, 2018)), and with reference to a previous collection of native bees collected on the Swan Coastal Plain (K. Prendergast, 2019, 2020b), which in turn were cross-checked with the WA Museum Entomology collection. When a species could not be keyed out or did not match any published descriptions, it was assigned a unique morphospecies identification.

Table 2: Survey site descriptions

Site ID	Search Date/s	Latitude	Longitude	Locality	Site description	Notes
WBE01	27/11/2023	-32.210547	115.855241	Referral area	Jarrah/ Banksia woodland over various Myrtaceous shrubs over both native grasses and invasive species. Some Jarrah in flower	Some evidence of parasitising bees present which indicates the possibly presence of habitat for the burrowing species of interest
WBE02	27/11/2023	-32.209964	115.848842	Referral area	Jarrah/ Banksia woodland over <i>Jacksonia</i> and <i>Kunzea</i> over native grasses and invasive species.	Multiple bee species collected as well as a number of parasitic wasp species indicating possible host presence
WBE03	27/11/2023, 19/2/2024, 23/10/2024	-32.209557	115.844562	Referral area (adjacent)	Jarrah/ Banksia woodland over <i>Xylomelum</i> and <i>Jacksonia</i> over <i>Macrozamia</i> and various grasses.	<i>L. zephyr</i> collected, as well as other bee species predominantly on flowering <i>Jacksonia</i>
WBE04	27/11/2023	-32.209436	115.839083	Referral area	Open <i>Melaleuca</i> and <i>Kunzea</i> over pink flowering <i>Chamelaucium</i> (?) Over assorted grasses.	Some native bee species recorded and many honey bees
WBE05	27/11/2023, 19/02/2024, 23/10/2024	-32.207889	115.796797	Referral area	Predominantly open Tuart/ Banksia woodland over assorted <i>Acacia</i> species, <i>Xanthorrhoea</i> and <i>Macrozamia</i> over assorted grasses.	Very little in flower besides Banksias.
WBE06	27/11/2023	-32.21008	115.832812	Referral area	Scattered Jarrah over predominantly Banksia woodland.	<i>Heniandra</i> present supporting bee species
WBE07	13/12/2023	-32.208885	115.894167	Contextual site - Jandakot Regional Park	Sandy loam soil dominated by open Banksia woodland. At least four species of <i>Banksia</i> , also <i>Allocasuarina</i> over <i>Adenanthos</i> and <i>Kunzea</i> over <i>Xanthorrhoea</i> and <i>Macrozamia</i> over <i>Conostylus</i> and other native grasses and small shrubs.	Native bee species collected
WBE08	13/12/2023	-32.167842	115.930592	Contextual site - Forrestdale Lake Nature Reserve	<i>Kunzea</i> shrubland on sandy loam.	Bees collected from site as comparison and to see if can replicate same veg/ soil types for target species.
WBE09	13/12/2023	-32.208786	115.844166	Referral area	Largely cleared private block of land. Sandy loam soil, open mixture of Marri, Jarrah, <i>Melaleuca</i> and <i>Allocasurina</i> over <i>Kunzea</i> and <i>Xanthorrhoea</i> over mostly invasive weed species.	Native bees collected
WBE10	13/12/2023	-32.209852	115.844613	Referral area (adjacent)	Open Jarrah/ Banksia woodland over dense <i>Xylomelum</i> Over <i>Jacksonia</i> , <i>Kunzea</i> and <i>Macrozamia</i> over invasive grasses. Adjacent WBE03SRE.	Native bees collected (nearby WBE03)
WBE11	29/1/2024, 19/02/2024	-32.214792	115.829631	Contextual site - Beeliar Regional Park	Tuart/Jarrah/Banksia woodland over <i>Jacksonia</i> and weedy grasses.	Native bees collected
WBE12	23/10/2024	-32.209478	115.845554	Referral area (adjacent)	Very dense and mature <i>Jacksonia furellata</i> site, one of the more dominant species on site, some of which are beginning to	No bees collected (nearby WBE03 and WBE10).

Site ID	Search Date/s	Latitude	Longitude	Locality	Site description	Notes
					flower. Soil is a sandy loam and dominated by taller eucalypts over Banksias over <i>Jacksonia</i> and <i>Kunzea</i> over many weed species of grass and herbs.	
WBE13	23/10/2024	-32.209144	115.843528	Referral area	Several large <i>Callistemon</i> in full flower on a sandy loam soil. Covered in honey bees.	No native bees recorded
WBE14	23/10/2024	-32.208627	115.795940	Referral Area	Large grove of flowering <i>Callistemon</i> along road verge over shadowed by Jarrah over banksia and Sheoaks over <i>Acacias</i> . Soil a sandy clay loam, sloping from north down toward roadway. Banks covered in weeds predominantly grasses	<i>Callistemon</i> as with other flowering plants is covered in honey bees but no native bees recorded.
WBE15	23/10/2024	-32.160828	115.949219	Referral area	Large grove of flowering <i>Callistemon</i> in road reserve. Upper storey Jarrah, Banksia, Sheoak and Acacia.	Dominated by introduced honey bees. No native bees recorded.
WBE50	23/10/2024	-32.162732	115.951668	Contextual site - Forrestdale Lake Nature Reserve	Known short-tongued bee locality (DBCA pers. comm.). Marri and Melaleuca line adjacent roadway however majority of survey area treeless and dominated by short, narrow leaved <i>Melaleuca</i> and <i>Acacia</i> (approx between 1-2m in height), over lower growing <i>Melaleuca</i> , <i>Acacia</i> , <i>Verticordia</i> and various sedges, over <i>Thysanotus</i> and various herbs and grasses. No sign of <i>Goodenia</i> nor <i>Lobelia</i> (two preferred feeding genera). <i>Verticordia</i> , various species of Daisy and <i>Thysanotus</i> all flowering. No <i>Jacksonia</i> present	Honey bees present but no sign of short tongue bees.
WBE51	23/10/2024	-32.160827	115.949218	Contextual site - Forrestdale Lake Nature Reserve	Known short-tongued bee locality (DBCA pers. comm.). Predominantly low (up to head height) heathland, some <i>Calitris</i> over <i>Melaleuca</i> , <i>Acacia</i> and <i>Hakea</i> over <i>Kunzea</i> , <i>Melaleuca</i> . <i>Thysanotus</i> and daisies flowering. Area bordered by trees, <i>Melaleuca</i> , <i>Nuytsia</i> and <i>Banksia</i> . Substrate still damp and mainly clay loam, not as sandy as site 50. No <i>Jacksonia</i> present	Only honey bees present.

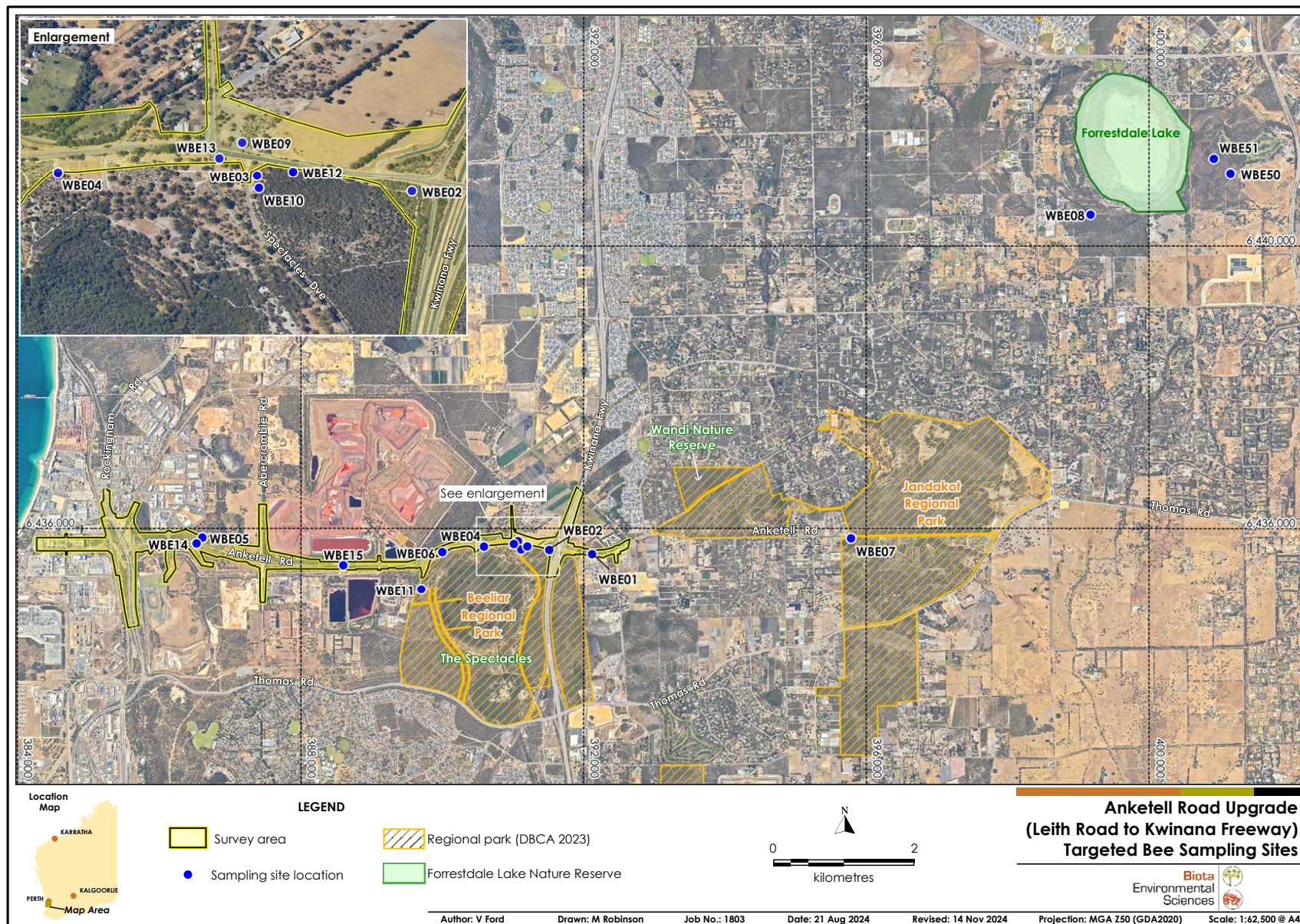


Figure 1. Native bee survey sites in relation to Anketell Road upgrade project.



Plate 1: Site WBE01 habitat



Plate 2: Site WBE02 habitat



Plate 3: Site WBE03 habitat



Plate 4: Site WBE04 habitat



Plate 5: Site WBE05 habitat



Plate 6: Site WBE06 habitat



Plate 7: Site WBE07 habitat



Plate 8: Site WBE08 habitat



Plate 9: Site WBE09 habitat



Plate 10: Site WBE10 habitat



Plate 11: Site WBE11 habitat



Plate 12: Site WBE12 habitat



Plate 13: Site WBE13 habitat



Plate 14: Site WBE14 habitat



Plate 15: Site WBE15 habitat



Plate 16: Site WBE50 habitat



Plate 17: Site WBE51 habitat

Weather data for the survey dates is presented in Table 3 and was collected from the Bureau of Meteorology's Jandakot Aero station 009172 located 13 km north of the project area. Conditions during the survey days were dry and warm to hot.

Long-term monthly mean rainfall, maximum temperature and minimum temperature data for Jandakot are presented in Figure 3 together with the monthly data for the year preceding the survey. Total rainfall for the year preceding the survey was considerably lower than average (November 2022 – October 2023 total 597 mm versus long-term average of 808.4 mm).

Table 3: Weather observations from Jankdakot Aero (#009172) for the field survey dates.

Survey Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)
27/11/2023	19.3	26.2	0.4
13/12/2023	13.5	-*	0
29/1/2024	16.8	28.8	0
19/2/2024	28	42.8	0
23/10/24	8.7	28.6	0

*BoM data missing

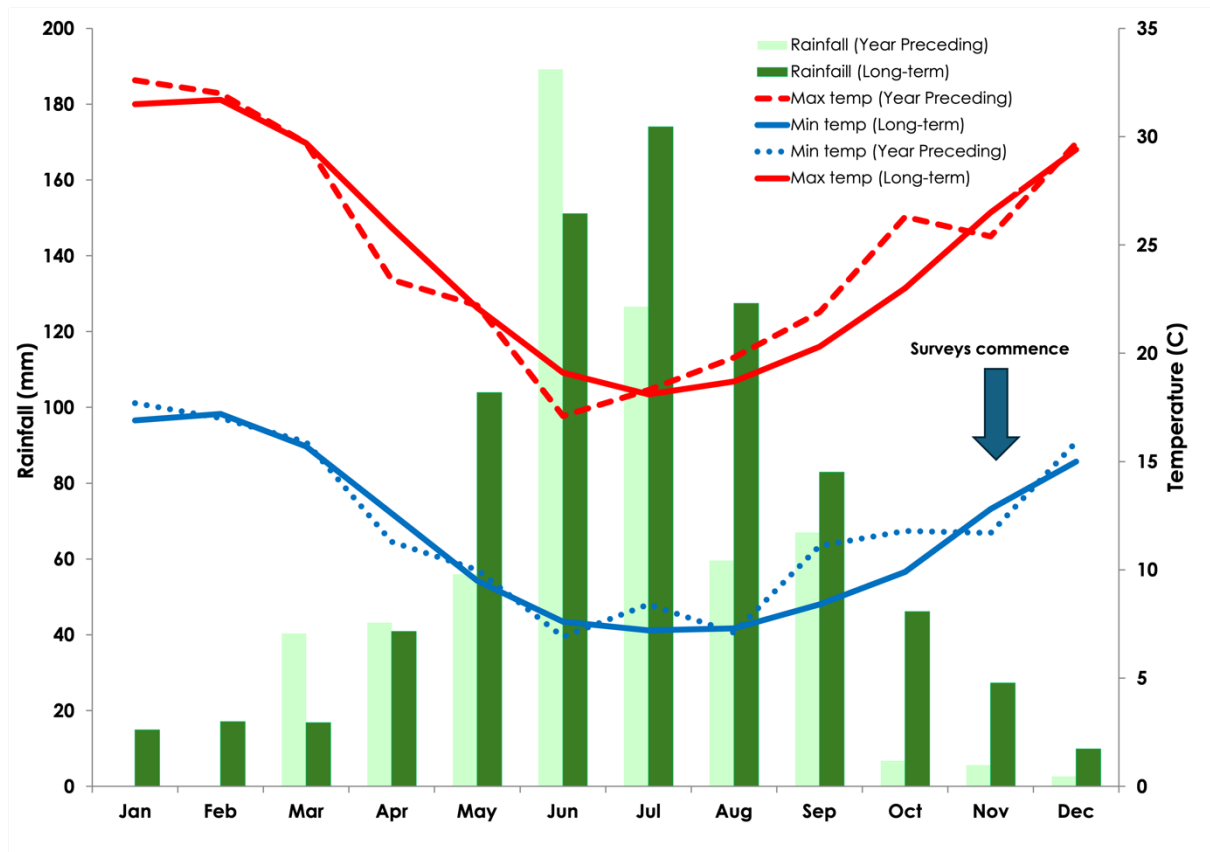


Figure 3: Long-term average monthly rainfall, maximum temperature and minimum temperature together for monthly averages for the year preceding surveys (Bureau of Meteorology Station 009172I; 1972 – 2024).

Limitations potentially affecting the study have been addressed in Table 4.

Table 4: Potential limitations and constraints of the targeted bee survey.

Potential Constraint	Statement of Limitations
1. Availability of contextual information at a regional and local scale	<ul style="list-style-type: none"> There have been limited surveys for the two threatened species: there has been no ongoing regular monitoring of the species in and around areas they were previously recorded at, nor of host plants in other locations. There is also no knowledge of their nesting biology. Contextual information is considered a limitation for the study.
2. Competency/ experience of the team carrying out the survey, including experience in the bioregion surveyed	<ul style="list-style-type: none"> The surveys were led by a bee specialist with 8 year experience and having conducted 20 surveys targeting <i>Neopasiphae simplicior</i> and/or <i>Leioproctus douglasiellus</i>, and over 100 surveys on ecologically similar bee species (Neopasiphaeinae species). Competency was not considered to be a limitation.

Potential Constraint	Statement of Limitations
3. Proportion of species recorded and/or collected, any identification issues (scope of the survey)	<ul style="list-style-type: none"> • The basic and targeted reconnaissance fauna survey recorded species via targeted and opportunistic methods, and verified habitats with the potential to support significant species. • Overall, identification and proportion of species recorded was not considered to be a limitation given the objectives of the surveys.
4. Appropriate area fully surveyed (effort and extent)	<ul style="list-style-type: none"> • The fauna survey targeted specific bee species of significance. The survey area was surveyed thoroughly with numerous sampling sites assessed and foot traverses completed by the team, including some in areas adjacent to the survey area and in known areas of occurrence more distance from the survey area. • Survey effort and extent were not considered to be limitations.
5. Access restrictions within the survey and contextual areas	<ul style="list-style-type: none"> • The survey area was readily accessible on foot, being located adjacent to the Bussell Highway. • Access was not a limitation.
6. Survey timing, rainfall, season of survey	<ul style="list-style-type: none"> • The area received lower than average rainfall in the year preceding the survey and conditions were particularly dry by the January/February 2024 phases of sampling. Lower than average rainfall in 2023 was considered to represent a moderate limitation for the current study.
7. Disturbance that may have affected the results of survey such as fire, flood or clearing	<ul style="list-style-type: none"> • The survey area occurs adjacent to a major road and as such included areas that were degraded, cleared and weed infested. • Disturbance was not considered to be a limitation for the purposes of fauna survey.

Results and Discussion

A total of thirty-five species belonging to nine genera and three families were recorded (Table 5). Neither of the listed threatened species targeted, *Leioproctus douglasiellus* or *Neopasiphae simplicior*, were recorded.

Surprisingly, only one Halictidae was collected. Halictids are generalist, ground-nesting bees, and whilst not dominant, there are typically a few, relatively abundant species. They remain active over the time period sampled in this study (November to February) and their absence may be due to a lack of suitable ground-nesting substrate. Only a single species of *Leioproctus* was recorded, again suggesting that this habitat may be poor for ground-nesting bees. However, there is currently no records of the nests of either *N. simplicior* or *L. douglasiellus*, and hence it cannot be stated with certainty that the areas surveyed are inappropriate nesting substrates for these listed species.

Table 5. Native bee species recorded November 2023 to October 2024. Null sites removed.

		27/11/2023						13/12/2023				29/01/2024						19/02/2024		23/10/2024	Total
		Referral area						Referral area		Contextual		Referral area				Contextual		Referral area	Contextual	Referral area	
Family	Species	WBE01	WBE02	WBE03	WBE04	WBE05	WBE06	WBE03	WBE09	WBE07	WBE08	WBE01	WBE03	WBE05	WBE09	WBE11	WBE07	WBE03	WBE11	WBE03	
Apidae	<i>Amegilla (Notomegilla) chlorocyanea</i>	1	5	1	1		10		2	6	6				2		2				36
	<i>Exoneurella setosa</i>										14										14
	<i>Thyreus waroonensis</i>	1								4	1										6
Colletidae	<i>Euhesma sp.1</i>		1																		1
	<i>Euhesma sp.2</i>										1										1
	<i>Euryglossina (Euryglossina) argocephala</i>																1				1
	<i>Euryglossina (Microdontura) mellea</i>									11	1		1								13
	<i>Hylaeus (Euprosopis) violaceus</i>									1											1
	<i>Hylaeus (Euprosopoides) ruficeps kalamundae</i>				1	1			3	7	4						7				23
	<i>Hylaeus (Gnathoprosopis) amicus</i>									4			1	1				1			7
	<i>Hylaeus (Gnathoprosopis) euxanthus</i>										1		1	1							3
	<i>Hylaeus (Macrohylaeus) alcyoneus</i>	1														1			6		8
	<i>Hylaeus (Prosopistemon) aralis</i>	1																			1
	<i>Hylaeus (Rhodohylaeus) lateralis</i>										10		2	1							13
	<i>Hyleoides zonalis</i>		1																		1
	<i>Leioproctus zephyr</i>			1																	1
	<i>Colletids</i>																	100			100
Halictidae	<i>Lipotriches (Austronomia) flavoviridis species-group</i>										2										2
Megachilidae	<i>Megachile "Beesintheburbs 29M cf. remotula"</i>									11											11
	<i>Megachile "gold-butt"</i>																		2		2
	<i>Megachile "houstoni"</i>							21	5	3											29
	<i>Megachile "KSP Meg19M" sp. nov.</i>				1					1	1										3
	<i>Megachile "KSP Meg27F BurrowingMegWH000560A" cf. ferox</i>				1																1
	<i>Megachile (Eutricharaea) chrysopyga</i>		3	1																	4
	<i>Megachile (Eutricharaea) macularis</i>													1							1
	<i>Megachile (Eutricharaea) obtusa</i>										1	1									2
	<i>Megachile (Eutricharaea) sp. Westport</i>		1																		1
	<i>Megachile (Hackeriapis) monkmani</i>					4															4
	<i>Megachile (Mitchellapis) fabricator</i>													1							1
	<i>Megachile fultoni</i>									7	18										25
	<i>Megachile leeuwinensis</i>			7																	7
	<i>Megachile preissi</i>									11											11
	<i>Megachile speluncarum</i>							21			1									1	23
	<i>Rozenapis ignita</i>			5									1			2					8
	<i>Megachile aurifrons</i>																1				1
	Species richness	4	5	5	4	2	1	2	3	11	13	1	5	5	1	2	4	2	2	1	35
	Abundance	4	11	15	4	5	10	42	10	66	61	1	6	5	2	3	11	101	8	1	366

A number of ground-nesting and predatory wasps were observed nesting at WBE01 and WBE02 in November. This suggests that the substrate is suitable for nesting for at least some Hymenopteran species. Of note, were parasitoid wasps and flies whose hosts are bees, including a Bombyliidae fly at WB02 in November, and a Gasteruptiidae wasp at WB05 in January. There is no information on the parasitoid associations of either of the threatened bee species, but the presence of bee parasitoids does suggest that there are healthy host populations present.

The number of bee species per site surveyed ranged from zero to five at sites in or adjacent to the Referral boundary, and 11 and 13 species in the contextual sites. In general the contextual sites (Jandakot RP and Forrestdale NP) had higher abundances and diversities of bees, as can be expected given their larger area of contiguous undisturbed habitat.

Of the sites in or adjacent to the Referral area, WBE03, 20 m south Beeliar Regional Park hosted a high diversity and abundance of native bees on *Jacksonia furcellata* (Table 5). Of particular interest was finding *Leioproctus zephyr*, a rare native bee described in 2022 (K. S. Prendergast, 2022). This species was previously known from five locations in southwest Western Australia, and has been recorded from two plant species in the genus *Jacksonia* (K. S. Prendergast, 2022). Whilst it has not been assessed formally to designate a conservation status, based on IUCN criteria it should be considered Vulnerable (K. S. Prendergast, 2022). This species is in the process of being formally listed (Kit Prendergast and Jessica Marsh (Invertebrates Australia), pers. comms. 2024). This represents a new location and host record (*J. furcellata*). It is unusual as despite thousands of hours surveying *J. furcellata*, including at sites where *L. zephyr* was recorded, it had not been found on *J. furcellata* before. As with *Neopasiphae simplicior* and *Leioproctus (Andrenopsis) douglasiellus*, the nests of this species are unknown, and similar to these species, all we can be confident in is that it is a ground-nesting species based on the nesting biology of nests recorded of other species in these genera.

No bees were recorded alongside ALCOA land (WRF02MC, WRF03MC, WRF04MC). However at the time of surveys, the *Melaleuca* trees which were present by the side of the road (and which bees had been collected on at WBE05) had largely dried out, and surveys were conducted in the later hours of the day (past 1500hr) when bee activity dies down.

Abundances ranged from zero to 101, and in the 60s for the contextual sites (Table 5). The highest abundance was recorded at WBE03 in February but unfortunately the bees were too high to collect with the sweepnet, foraging in the canopy of *Eucalyptus*, however they were native bees, and video

footage was recorded. Without collection they could not be identified to species but based on their body size, shape and behaviour they appeared to be Euryglossines and/or Hylaeinaes, concentrating activity on the eucalypt as there was almost nothing else in flower at the time. The next highest abundances were recorded also at WBE03 in December.

In October 2024 native bee surveys were conducted both within the Referral area, and localities where the Threatened native bee species had been previously recorded at Forrestdale Lake Nature Reserve (provided with permission through DBCA). Despite relatively good rainfall and clear conditions, no native bees were observed at Forrestdale Lake, or at sites within or nearby the Referral area, with the exception of a single male *Megachile speluncarum*, flying presumably in search of females. During the October 2024 sampling phase, there were overall relatively few flowering resources, however, at Forrestdale Lake Nature Reserve there was good cover of *Verticordia*, and in the Referral area, *Callistemon*, *Calothamnus* and *Xanthorrhoea preissii*; known resources for native bees based on previous surveys in the southwest. Only two *Goodenia* (host of the rare bees) were observed at Forrestdale Lake Nature Reserve. The lack of native bees is unexpected, given that surveys conducted in Armadale and Roleystone by the author a week before found native bees to be present and relatively active. There was however high densities of the introduced European honey bees, *Apis mellifera*, on these plants during the survey, such that they may be excluding native bees (K. S. Prendergast, Dixon, & Bateman, 2022; K. S. Prendergast & Ollerton, 2022).

Bee-plant interaction matrices are presented in Appendix A. Myrtaceae and Fabaceae were the main foraging resources. In particular, *Jacksonia furcellata* was a key resource especially for megachilids; *Corymbia calophylla*, *Regelia ciliata* and *Eucalyptus gomphocephala* were also highly visited. The host plants of *Leioproctus douglasiellus* and *Neophasiphae simplicior* were not observed.

As noted previously, rainfall in the year preceding the surveys to November 2023 was much lower than average (Figure 3; 597 mm versus 808.4 mm) and by February 2024 vegetation was dry and very little was in flower. Nevertheless, one species was collected exclusively in February 2024, emphasising the value of still conducting surveys during this month. A high biodiversity of native bees was recorded during this survey period, however, given the dry season, it may not be a comprehensive representation of the native bee assemblages of the area. This can be seen even comparing the sites visited between months here (Table 5). For example, at WBE05, bee abundance and diversity varied over the four months from five individuals and two species in

November, no records in December, five individuals and five species in January, and no records in February or October. This pattern of shifts in bee abundance, diversity and composition between months even when surveying the same location has also been underscored in previous surveys in the southwest of WA (K. Prendergast, 2019, 2020a, 2021a, 2021b, 2021c, 2023a, 2023b, 2023c, 2023d).

Likelihood of threatened species occurrence within the project area

Neopasiphae simplicior was not recorded in the current study from five phases of sampling across its known active period. Based on previous records of *Neopasiphae simplicior* in the region, its more generalist diet and recent records across the southwest, it is considered to have low to moderate likelihood of occurrence within the Referral area. We would note all but one of the plant species from which it has previously been recorded have been found absent from the survey area during detailed flora surveys (Biota 2024) and were also not observed during the bee surveys at contextual sites within the reserves. Only one host plant, *Lobelia tenuior*, was recorded by Biota during botanical surveys; in one quadrat towards the western end of Referral area, as well as at four locations near Jandakot Regional Park. There is a possibility that *N. simplicior* forages on other host species, given it has been recorded from a number of plant families (including, recently Stylidiaceae, see above). There is the possibility that if host plants occur within a kilometre of the Referral area, it may nest there, however as nests have never been discovered, it is not possible to determine the suitability of substrate in the Referral area as nesting habitat for this species.

Leioproctus (Andrenopsis) douglasiellus is assessed as having a low likelihood of occurrence, given fewer records, especially few recent records, and none of its host plants have been recorded in or around the Referral area. It also appears to prefer claypan habitat based on its previous records at Kenwick wetlands, Cannington and Forrestdale Lake – habitat that is not within the Referral area. The same considerations regarding nesting habitat of *N. simplicior* apply to *L. douglasiellus*.

To better understand these species, their phenology, hosts, and importantly, conservation status, returning to sites where these species and their hosts has been recorded is also needed, which requires obtaining the exact locality information from state records.

Leioproctus zephyr is confirmed to occur adjacent to the proposed project area (K. Prendergast, 2024b). As its conservation listing is imminent, and its conservation status as rare and specialised is

clear, the project needs to take into consideration the risks posed to this newly described species (K. Prendergast, 2024b).

Attachments:

Appendix A: Bee-plant interaction matrix Nov-Feb Westport surveys

References

- Biota (2024). Anketell Road Upgrade Consolidated Biological Survey. Unpublished report prepared for Main Roads WA, March 2024, Biota Environmental Sciences, West Perth, WA.
- Atlas of Living Australia. (2024a). Atlas of Living Australia website. Species page: *Leioproctus (Andrenopsis) douglasiellus*. Retrieved from [https://biocache.ala.org.au/occurrences/search?q=taxa%3A%22Leioproctus%20\(Andrenopsis\)%20douglasiellus%22&qualityProfile=ALA&q=-_nest_parent_%3A*&fq=state%3A%22Western+Australia%22#tab_mapView](https://biocache.ala.org.au/occurrences/search?q=taxa%3A%22Leioproctus%20(Andrenopsis)%20douglasiellus%22&qualityProfile=ALA&q=-_nest_parent_%3A*&fq=state%3A%22Western+Australia%22#tab_mapView). Retrieved 24/04/2024, from Atlas of Living Australia [https://biocache.ala.org.au/occurrences/search?q=taxa%3A%22Leioproctus%20\(Andrenopsis\)%20douglasiellus%22&qualityProfile=ALA&q=-_nest_parent_%3A*&fq=state%3A%22Western+Australia%22#tab_mapView](https://biocache.ala.org.au/occurrences/search?q=taxa%3A%22Leioproctus%20(Andrenopsis)%20douglasiellus%22&qualityProfile=ALA&q=-_nest_parent_%3A*&fq=state%3A%22Western+Australia%22#tab_mapView)
- Atlas of Living Australia. (2024b). Atlas of Living Australia website. Species page: *Neopasiphae simplicior*. Retrieved from https://biocache.ala.org.au/occurrence/search?q=lsid%3Ahttps%3A%2F%2Fbiodiversity.org.au%2Fafd%2Ftaxa%2Fb7d93328-22ac-4489-bf2a-1db61cc8e703&qualityProfile=ALA&q=-_nest_parent_%3A*. Retrieved 24/04/2024, from Atlas of Living Australia https://biocache.ala.org.au/occurrence/search?q=lsid%3Ahttps%3A%2F%2Fbiodiversity.org.au%2Fafd%2Ftaxa%2Fb7d93328-22ac-4489-bf2a-1db61cc8e703&qualityProfile=ALA&q=-_nest_parent_%3A*
- Batley, M. (2020). A tale of two sites. *The Cross Pollinator*(12). Retrieved from <https://resources.austplants.com.au/stories/a-tale-of-two-sites/>
- Batley, M. (2024, 13/2/2024). How poorly we understand the distribution and abundance of bees. Retrieved from <https://www.anba.org.au/news/how-poorly-we-understand-the-distribution-and-abundance-of-bees/>
- Connell, S. (2012). *Survey for Conservation Significant Bee Species Keane Road Strategic Link*. Retrieved from Perth, Western Australia:
- Department of the Environment. (2018a). *Leioproctus douglasiellus* in Species Profile and Threats Database. Retrieved from http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=66756
- Department of the Environment. (2018b). *Neopasiphae simplicior* in Species Profile and Threats Database. Retrieved from http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=66821
- Houston, T. F. (1994). *Proposed addition deletion or change to the schedules of declared threatened or specially protected fauna or the reserve list. Neopasiphae simplicior*. Retrieved from Perth:
- Houston, T. F. (2018). *A Guide to the Native Bees of Australia*: CSIRO Publishing.
- Houston, T. F., & Prendergast, K. S. (2022). The tiny bee *Euryglossina (Microdontura) mellea* (Cockerell) (Hymenoptera: Colletidae, Euryglossinae) in Western Australia—introduced, or indigenous and long-overlooked? *The Australian Entomologist*, 49(4), 287-295.
- Prendergast, K. (2019). *Southern Link Road Native Bee Surveys*. Retrieved from Fremantle, Western Australia:

https://www.epa.wa.gov.au/sites/default/files/Referral_Documentation/Attachment%205%20Native%20Bee%20Survey.pdf

- Prendergast, K. (2020a). *Plant-pollinator network interaction matrices and flowering plant species composition in urban bushland remnants and residential gardens in the southwest Western Australian biodiversity hotspot*. Retrieved from: <https://doi.org/10.25917/5f3a0aa235fda>, <https://researchdata.edu.au/plant-pollinator-network-biodiversity-hotspot>
- Prendergast, K. (2020b). *Species of native bees in the urbanised region of the southwest Western Australian biodiversity hotspot*. Retrieved from: <https://doi.org/10.25917/5ee09df795b7c>, <https://researchdata.edu.au/species-native-bees-biodiversity-hotspot>
- Prendergast, K. (2021a). *City of Bayswater Native Bee Surveys November – February 2020/21*. Retrieved from City of Bayswater, Western Australia: <https://www.bayswater.wa.gov.au/CityOfBayswater/files/35/3511fbd7-0d69-4cd5-8841-f59888917161.pdf>
- Prendergast, K. (2021b). *Kalamunda Native Bee Surveys Spring-Summer 2020/21 at Ledger Hill Reserve, Maida Vale Reserve, and Poison Gully Reserve*. Retrieved from Kalamunda, Western Australia:
- Prendergast, K. (2021c). *Kooljerrinup Nature Reserve Native Bee Report. Results of native bee surveys September – January 2020/21 with a focus on the Critically Endangered Neopasiphae simplicior. Report produced by Dr Kit Prendergast for the Western Australian Government's Department of Biodiversity, Conservation and Attractions (DBCA)*. Retrieved from Western Australia:
- Prendergast, K. (2022). *City of Bayswater Native Bee Surveys October – February 2021/22*. Retrieved from City of Bayswater, Western Australia:
- Prendergast, K. (2023a). *DBCA Jarrah Forest Native Bee Report: Chandler Forest Block. Report produced by Dr Kit Prendergast for the Western Australian Government's Department of Biodiversity, Conservation and Attractions (DBCA)*. Retrieved from
- Prendergast, K. (2023b). *DBCA Jarrah Forest Native Bee Report: Cooke. Report produced by Dr Kit Prendergast for the Western Australian Government's Department of Biodiversity, Conservation and Attractions (DBCA)*. Retrieved from
- Prendergast, K. (2023c). *DBCA Jarrah Forest Native Bee Report: Flint. Report produced by Dr Kit Prendergast for the Western Australian Government's Department of Biodiversity, Conservation and Attractions (DBCA)*. Retrieved from
- Prendergast, K. (2023d). *DBCA Jarrah Forest Native Bee Report: Gordon. Report produced by Dr Kit Prendergast for the Western Australian Government's Department of Biodiversity, Conservation and Attractions (DBCA)*. Retrieved from
- Prendergast, K. (2024a, 27/11/2024). *Leioproctus douglasiellus*. iNaturalist. Retrieved from <https://www.inaturalist.org/observations/255832288>
- Prendergast, K. (2024b). *TECHNICAL MEMO: Leioproctus zephyr*. Retrieved from
- Prendergast, K., & Dorey, J. B. (2023). *Xanthesma (Xenohesma) perpulchra and Xanthesma (Xanthesma) brachycera are conspecific based on DNA barcodes. Australian Journal of Taxonomy*, 39, 1-10. doi:<https://doi.org/10.54102/ajt.df83w>
- Prendergast, K. S. (2022). *Leioproctus zephyr* Prendergast (Hymenoptera, Colletidae, Leioproctus), an oligolectic new bee species with a distinctive clypeus. *Journal of Hymenoptera Research*, 93, 167-188. Retrieved from <https://doi.org/10.3897/jhr.93.85685>
- Prendergast, K. S., Dixon, K. W., & Bateman, P. W. (2022). The evidence for and against competition between the European honeybee and Australian native bees. *Pacific Conservation Biology*, -. doi:<https://doi.org/10.1071/PC21064>
- Prendergast, K. S., & Hogendoorn, K. (2021). FORUM: Methodological shortcomings and lack of taxonomic effort beleaguer Australian bee studies. *Austral Ecology*, n/a(n/a). doi:<https://doi.org/10.1111/aec.13041>

- Prendergast, K. S., Menz, M. H. M., Dixon, K. W., & Bateman, P. W. (2020). The relative performance of sampling methods for native bees: an empirical test and review of the literature. *Ecosphere*, 11(5), e03076. doi:10.1002/ecs2.3076
- Prendergast, K. S., & Ollerton, J. (2022). Impacts of the introduced European honeybee on Australian bee-flower network properties in urban bushland remnants and residential gardens. *Austral Ecology*, 47(1), 35-53. doi:<https://doi.org/10.1111/aec.13040>

November	<i>Eucalyptus marginata</i>	<i>Calothamnus quadrifidus</i>	<i>Jacksonia furcellata</i>	<i>Melaleuca lanceolata</i>	<i>Hemiandra pungens</i>	<i>Banksia attenuata</i>	<i>Taxandria linearifolia</i>
<i>Amegilla chlorocyanea</i>	1	5		1	10		
<i>Megachile chrysopyga</i>			4				
<i>Rozenapis ignita</i>			6				
<i>Megachile leeuwinensis</i>			6				
<i>Megachile (Hackeriapis) monkmani</i>			5				
<i>Hylaeus (Macrohylaeus) alcyoneus</i>						1	
<i>Hylaeus (Prosopistemon) aralis</i>						1	
<i>Megachile "houstoni"</i>			1				
<i>Hyleoides zonalis</i>		1					
<i>Euhesma</i> sp.			1				
<i>Megachile (Eutricharaea) sp. Westport</i>			1				
<i>Leioproctus zephyr</i>			1				
<i>Hylaeus (Euprosopoides) ruficeps kalamundae</i>				2			
<i>Megachile "KSP Meg27F Burrowing Meg WH000560A" cf. ferox</i>							1
<i>Megachile "KSP Meg19M" sp. nov.</i>							1

December	<i>Jacksonia furcellata</i>	<i>Baeckea camphorosmae</i>	<i>Corymbia calophylla</i>	<i>Isotropis cuneifolia</i>	<i>Melaleuca lanceolata</i>	<i>Nyctia floribunda</i>	<i>Pericalymma ellipticum</i>	<i>Scholtzia involucrata</i>
<i>Megachile "houstoni"</i>	23	2					11	
<i>Megachile speluncarum</i>	22							
<i>Megachile "KSP Meg19M" sp. nov.</i>		1					1	
<i>Euryglossina (Microdontura) mellea</i>			11					
<i>Hylaeus (Gnathoprosopis) euxanthus</i>								
<i>Hylaeus (Gnathoprosopis) amicus</i>			4		1			
<i>Hylaeus (Euprosopoides) ruficeps kalamundae</i>			7		3		5	
<i>Hylaeus (Euprosopis) violaceus</i>			1					
<i>Megachile preissi</i>				11				
<i>Megachile "Beesintheburbs 29M cf. remotula"</i>				11				
<i>Rozenapis ignita</i>	2							
<i>Thyreus waroonensis</i>						2		
<i>Megachile fultoni</i>								7
<i>Megachile (Eutricharaea) obtusa</i>	1							
<i>Hylaeus (Rhodohylaeus) lateralis</i>							10	
<i>Exoneurella setosa</i>								
<i>Amegilla (Notomegilla) chlorocyanea</i>				1		1		
<i>Lipotriches (Austronomia) flavoviridis species-group</i>								
<i>Euehesma</i> sp.							2	

December (cont'd)	<i>Thryptomene saxicola</i>	<i>Eucalyptus macrandra</i>	<i>Vitex trifolia</i>	<i>Echium plantagineum</i>	<i>Lechenaultia floribunda</i>	<i>Banksia attenuata</i>	<i>Regelia ciliata</i>
<i>Megachile "houstoni"</i>		1	5		1		
<i>Megachile speluncarum</i>							
<i>Megachile "KSP Meg19M" sp. nov.</i>							
<i>Euryglossina (Microdontura) mellea</i>							
<i>Hylaeus (Gnathoprosopis) euxanthus</i>						1	
<i>Hylaeus (Gnathoprosopis) amicus</i>							
<i>Hylaeus (Euprosopoides) ruficeps kalamundae</i>							
<i>Hylaeus (Euprosopis) violaceus</i>							
<i>Megachile preissi</i>							
<i>Megachile "Beesintheburbs 29M cf. remotula"</i>							
<i>Rozenapis ignita</i>							
<i>Thyreus waroonensis</i>					2		1
<i>Megachile fultoni</i>	1			2			15
<i>Megachile (Eutricharaea) obtusa</i>							
<i>Hylaeus (Rhodohylaeus) lateralis</i>							
<i>Exoneurella setosa</i>				14			
<i>Amegilla (Notomegilla) chlorocyanea</i>			1		4		4
<i>Lipotriches (Austronomia) flavoviridis species-group</i>							2
<i>Euehesma</i> sp.							

January	<i>Jacksonia furcella</i>	<i>Eucalyptus gomphocephala</i>	<i>Persoonia saccata</i>	<i>Scholtzia involucrata</i>	<i>Banksia menziesii</i>	<i>Melaleuca lanceolata</i>	<i>Calytrix fraseri</i>	<i>Corymbia calophylla</i>
<i>Megachile (Eutricharaea) obtusa</i>	1							
<i>Hylaeus (Gnathoprosopis) euxanthus</i>		1				1		
<i>Hylaeus (Gnathoprosopis) amicus</i>		1				1		
<i>Euryglossina (Microdontura) mellea</i>		1						
<i>Hylaeus (Rhodohylaeus) lateralis</i>		2				1		
<i>Rozenapis ignita</i>	3	3						
<i>Amegilla (Notomegilla) chlorocyanea</i>			1				1	
<i>Megachile aurifrons</i>				1				
<i>Hylaeus (Macrohylaeus) alcyoneus</i>					1			
<i>Megachile (Mitchellapis) fabricator</i>						1		
<i>Megachile (Eutricharaea) macularis</i>						1		
<i>Hylaeus (Euprosopoides) ruficeps kalamundae</i>								1
<i>Euryglossina (Euryglossina) argocephala</i>								1

February	<i>Banksia prionotes</i>	<i>Jacksonia sternbergiana</i>	<i>Eucalyptus gomphocephala</i>
<i>Hylaeus (Macrohylaeus) alcyoneus</i>	6		
<i>Megachile "gold-butt"</i>		2	
<i>Hylaeus (Gnathoprosopis) amicus</i>			1
<i>Colletids</i>			100