Vascular Plants Report

Kiwirrkurra Indigenous Protected Area, Western Australia

6/9/15 – 18/9/15

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Vascular Plants

Contents

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List of contributors to this report.			
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Abstract

The Kiwirrkurra Indigenous Protected Area (IPA) lies in the far south-east of Western Australia's East Pilbara Shire on the boundary of the Gibson Desert and Great Sandy Desert bioregions. Its rectangular boundary runs *c.* 140 km N-S and *c.* 300 km E-W fom the North Territory (NT) border, to the south-west of Lake Mackay. The area was identified as a high priority for biological survey following CSIRO Gap Analysis. A Bush Blitz expedition to the IPA in early September 2015 made 585 vascular plant collections, comprising 316 taxa from 48 families; 170 of these (54%) were new records for the IPA. Five of these taxa were collected for the first time in WA, with eight new names to be erected on the WA plant census. Seven liverwort specimens were also collected, representing at least four taxa from a single genus.

Many of these collections are important in that they fill significant gaps in the ranges of widespread species, or significantly extend the ranges of species otherwise known from further east or west, thus contributing greatly to our knowledge of the flora of the Gibson and Great Sandy Deserts. In addition, a number of specimens are atypical and could not be placed confidently in any known taxon; some of these may represent atypical representatives of described species, but some very likely represent new taxa. There is potential for up to eight new taxa to be described from specimens collected during this Bush Blitz. A total of 435 vascular plant taxa have now been recorded from the IPA, most vouchered in an Australian herbarium.

No EPBC-listed plant species were collected during this Bush Blitz, but nine taxa with Priority (P) conservation-listing in Western Australia ranging from Priority 1 (P1) to Priority 3 (P3) were. In addition, four weed species and one naturalised taxon were collected, with the status of the latter considered uncertain. A fifth weed species was returned from AVH records.

1. Introduction

The Kiwirrkurra Indigenous Protected Area (IPA) was declared in September 2014. The IPA lies in the far south-east of Western Australia's East Pilbara Shire. It has an area of 45,867 km^2 and extends from the northern edge of Lake Mackay on the Northern Territory(NT) border south to Lake Macdonald and *c.* 300 km west, beyond Jupiter Well (Figure 1). The IPA spans two IBRA regions and three subregions: Great Sandy Desert bioregion (*c.* 21,585 km^2; subregion Mackay), which is well-represented in the National Reserve System, and Gibson Desert bioregion (*c.* 24,193 km^2; subregions Lateritic Plain and Dune Field), of which <10% is reserved. Kiwirrkurra IPA shares its southern boundary with Ngaanyatjarra IPA and most of its eastern boundary with Southern Tanami IPA, forming part of an extensive network of central desert reserves and conservation areas, under both Indigenous and non-Indigenous management. The IPA contains the permanent settlement of Kiwirrkurra and several intermittently used outstations, including Nyinmi and Marruwa, and is traversed E-W by the Gary Junction Road (Paltridge 2010; Tjamu Tjamu 2014).

Little formal biological survey work has been conducted in the Kiwirrkurra region; there has been no quantitative survey of the IPA and no quadrat-based floristic data has been collected (Kendrick 2001). A valuable synthesis of biological knowledge about the IPA was produced by Paltridge (2010), who summarised all known scientific data, derived from Nature Map (Department of Parks and Wildlife 2007–) and Desert Wildlife Services' field trips undertaken during 2000–2003. In addition, a wealth of undocumented Indigenous ecological knowledge exists due to the close and continuous connection between the Pintubi people and their country. Many Kiwirrkurra residents are still engaged in traditional land-use practices including hunting, gathering bush foods, patch burning, and fresh water harvesting (Paltridge 2010; Tjamu Tjamu 2014). The Tjamu Tjamu Aboriginal Corporation is highly supportive of integrating scientific and Indigenous knowledge and fostering two-way learning opportunities between scientists and Traditional Owners, to accomplish their land management aims and develop conservation strategies for the Kiwirrkurra IPA.

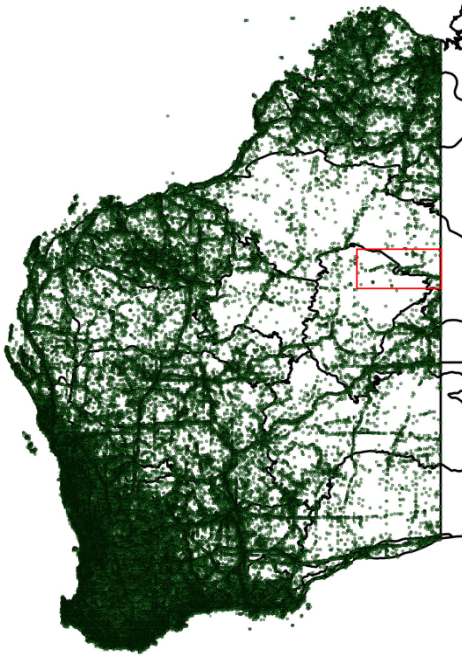

Figure 1. Map of Western Australia showing the locations of the Kiwirrkurra IPA (red rectangle) and all vascular plant specimen records in Australia's Virtual Herbarium (AVH; Council of Heads of Australasian Herbaria 2015). Interim Biogeographic Regionalisation for Australia (IBRA) v. 7 boundaries are shown in black, with the Kiwirrkurra IPA straddling the boundary between the Gibson Desert (SW corner) and Great Sandy Desert (NE corner) bioregions.

Based on AVH records, previous collecting effort for vascular plants has been concentrated along the Gary Junction Road and areas around the Kiwirrkurra settlement, Buck Hills, Dovers Hills, Pollock Hills and north-western Lake Mackay, including the Marruwa outstation area (Figure 2). Collections have mostly been opportunistic, with usually a handful of specimens collected in any one year (Figure 3). Clear peaks are associated with the collection efforts of A.S. George in 1967 (157 collections) and P.K. Latz in 1998 (33 collections) and 2000 (73 collections). In comparison, close to 600 collections were made on the Bush Blitz expedition. George's collection localities indicate that he made an abundance of general collections along the Gary Junction Road and in the various small ranges to the north and south. Latz's collections in 1998 are similar, with his 2000 collections showing movement along the Balgo Road and a specific targeting of soaks and wetlands around Marruwa, and habitats on the west side of Lake Mackay. Lake Mackay was also targeted by G.M. Chippendale (1957) and R.H. Kuchel (1962), although they made very few collections (Figure 3). The only records of collections from Lake Macdonald are historical (e.g. by W.H. Tietkens).

Figure 2. Map of vascular plant collection records in the Kiwirrkurra IPA, pre the September 2015 Bush Blitz, from Australia's Virtual Herbarium (AVH; Council of Heads of Australasian Herbaria 2015).

Paltridge (2010) reported that 119 plant species had been collected from the IPA but that this was expected to be a small percentage of the actual species present, and that rare plants may be found in areas that have not been explored, particularly around Lake Macdonald (P.K. Latz, pers. comm, *fide* Paltridge 2010). Helicopter access available during this Bush Blitz will allow collecting from a wider range of sites and more-remote sites than has previously been possible. With relatively few collections made from the region (Figure 1), the Kiwirrkurra IPA was identified as being a high priority biological survey area through CSIRO gap modelling. This Bush Blitz expedition therefore provided the opportunity to undertake targeted surveys of the IPA, with the aim of discovering taxonomic novelties and providing baseline biodiversity data (i.e. species lists) to the Tjamu Tjamu Aboriginal Corporation . to assist them in implementing their *Plan for Country* (Tjamu Tjamu 2014).

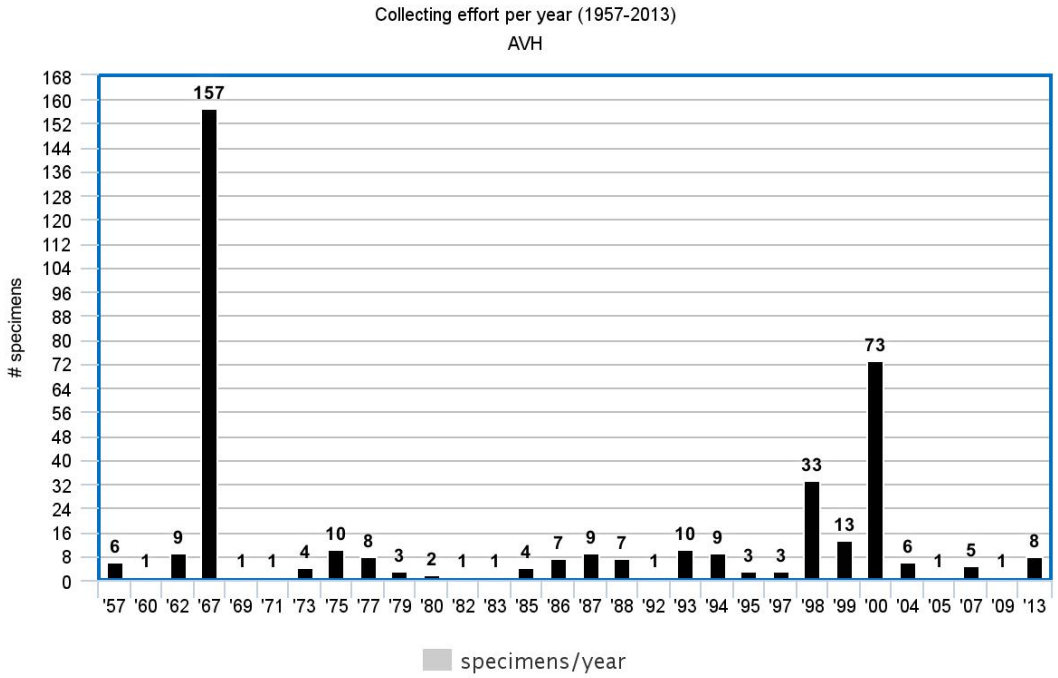

Figure 3. Collecting effort for vascular plants within the Kiwirrkurra IPA prior to the Bush Blitz expedition, based on AVH data (with duplicate specimens identified and pruned) for which collecting year was supplied (nine collections not graphed).

2. Methods

2.1 Site selection

The Kiwirrkurra IPA climate is arid, with very hot summers (January hottest; mean max. 40° C, mean min. 26° C), mild winters (June/July coolest, mean max. 23° C, mean min. 11° C), and an average annual rainfall of *c.* 220 mm (BOM data based on Kintore weather station, from 2000).

The landscape is dominated by extensive spinifex (*Triodia* spp.) covered dunefields interspersed with laterised uplands and playas. Red sand dunes are typically E-W in orientation, with sandy swales *c.* 1 km wide in between. Common iconic taxa include *Grevillea stenobotrya* on dunes and *Corymbia chippendalei* on dune crests, with swales supporting shrubland (*Acacia*, *Grevillea* and *Hakea* spp. dominant) over spinifex. The reticulated dune fields surrounding Jupiter Well support *Allocasuarina decaisneana*. A variety of spinifex species occur in the region with their distributions determined primarily by habitat (Paltridge 2010; Tjamu Tjamu 2014).

Two large salt lakes (Lake Mackay; Lake Macdonald) lie on the eastern boundary of the IPA and are only inundated after periods of heavy rain. A chain of much smaller salt lakes occurs along a palaeodrainage channel running south-west of Jupiter Well, and a series of freshwater claypans occurs in dune swales to the south and west of Lake Mackay. Gently undulating lateritic plains occur in the SW corner and support mulga shrubland over *Triodia basedowii*. There are a few low rocky ranges and hills (Pollock Hills and Angas Hills) dominated by spinifex (Paltridge 2010; Tjamu Tjamu 2014).

1:1,000,000 vegetation mapping of the Kiwirrkurra area was produced by Beard and Webb (1974) who identified ten vegetation associations at this small scale. Their vegetation descriptions were as follows:

- Shrublands; mulga scrub
- Hummock grasslands, shrub steppe; *Acacia pachycarpa* over *Triodia basedowii*
- Bare areas; salt lakes
- Mosaic: Hummock grasslands, open low tree steppe; desert bloodwood and feathertop spinifex on sandhills/Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills [dominant]
- Hummock grasslands, patchy shrub steppe; mulga over hard spinifex on laterite
- Hummock grasslands, shrub steppe; mixed shrubs over soft spinifex
- Hummock grasslands, steppe woodland; desert oak & soft spinifex
- Hummock grasslands, grass steppe; soft & hard spinifex & *T. basedowii*
- Hummock grasslands, steppe woodland; desert oak & soft spinifex between sandhills
- Succulent steppe with scrub; tea-tree over salt-flats

Patch burning – part of traditional Pintubi land-use – has created a vegetation mosaic in the dunefield habitat. Broad-scale patch burning is no longer extensively practised, however, with activities now localised and concentrated around Kiwirrkurra. Although approximately the same total area has been burnt, changing fire practices over the 41 years between 1953 and 1994 has seen fewer individual burnt patches, but these of much larger size (a tenfold increase; Burrows *et al.* 2006). These changes have impacted local refugia and the species diversity of mosaics (Paltridge 2010), and in areas of too-frequent or too-intense fire, have opened up habitats to weed invasion.

CSIRO Gap Analysis and environmental modelling identified a number of target areas within the IPA, suggesting survey locations that thoroughly sampled the full range of biophysical characteristics (soil characteristics, elevation, temperature, moisture etc.) on the property. These were ranked by a prediction of likelihood of discovering new species. Prior to arrival at the site the area was extensively (virtually) explored using Google Earth and GIS imagery, including maps of tenure, base geology, soil categories, vegetation and fire history provided by Bush Blitz. Discussions were held with field botanists with experience in the region to identify landforms and habitats that should be targeted. As the area had been poorly collected away from main access routes, as broad a range of habitats and vegetation communities as possible were selected for field sampling. Particular attention was given to areas of differing geologies, with complex geological mosaics, geologies known to have endemic taxa (e.g. gypsums), good water-holding properties (clay pans, soaks, wetland areas), and peculiar habitats. Preliminary sites were chosen to maximise the chance of finding significant specimens (i.e. novelties and range extensions).

Conditions in early September were found to be dry, with the drive from Alice Springs to Kiwirrkurra allowing us to assess that many taxa had finished flowering. These on-ground observations made it necessary to re-assess our site selection. Seemingly uniform landscape elements (dunes and swales) were found to be variable in species composition due to their mosaic vegetation structure, and brief reconnaissance trips found that adjacent dunes did not necessarily support identical species. The

influences of microclimate and fire history were apparent and dune sites burnt within the previous five years were observed to have high species diversity with more taxa flowering in the swales where moisture haad been retained. Similarly, given the dry conditions, areas around wetlands and moist clay pans were found to be the most productive for general collecting, and were targeted on the ground more than would have been the case earlier in the season when flowering would have been more widespread.

The expectation of the vascular plant team was that our collections would substantially increase the number of taxa known from the reserve, given how little of it had been surveyed, and that those collections would probably contain numerous range extensions, given the obvious gap in collections in the Kiwirrikurra area, the relatively low number of collections in the Gibson Desert and Great Sandy Desert bioregions overall, and the concentration of these along road networks (Figures 1, 2). The expectation of finding novel taxa was not particularly high given what was known of the regional flora and its diversity, the large areas of quite uniform habitat, and the late collecting time. The collection strategy was therefore directed towards sampling as wide a range of habitats as possible in order to obtain as much baseline data as possible while looking for new species.

2.2 Collection methods

The vascular plant team comprised four botanists, two from the Western Australian Herbarium (PERTH), one from the Northern Territory Herbarium at Alice Springs (NT), and one from the Australian National Herbarium (CANB) with extensive experience in the flora of Central Australia. The overall team was usually divided into two and teams were accompanied at times byTraditional Owners, who approved access to country. At each site, all available flowering or fruiting vascular plants were collected. Many species (particularly in drier parts of the landscape) were neither flowering nor fruiting, and these were not collected.

Specimens were generally pressed in the field to maximise quality; however, time constraints associated with helicopter schedules meant that many were pressed at the base camp following collection into large plastic bags. DNA samples were collected from targeted taxa (e.g. *Calandrinia*, *Lawrencia*, *Peplidium*, *Ptilotus*, *Stylidium*, *Tephrosia*; groups in Asteraceae, Cyperaceae), as were flowers into ethanol. Small seedlots of all available *Tephrosia* taxa were collected for taxonomic research, by sampling soil below plants. Most collections were duplicated so that all participating herbaria would have a full set of specimens from the expedition; however, a small number of collections were not, because insufficient material was available (i.e. low numbers of plants present or fertile in the field).

2.2.1 Methods used at standard survey sites

Two standard survey sites were established near Kiwirrkurra. The first in dunefields to the north-east of the settlement, the second in mulga woodland on a laterised plain to the south of the settlement. At both sites a 20 × 20 m quadrat was established to encompass a single vegetation community and all fertile (flowering or fruiting) vascular plant species were collected.

2.3 Identifying the collections

Collections were preliminarily identified in the field and at the base camp, and then formally identified at the participating herbaria, where specimens could be compared against research collections. At the conclusion of the expedition all specimens were taken to the Alice Springs herbarium to finish drying. They were then sorted by collector and distributed in batches to their collector's herbarium for identification and processing (i.e. specimens collected by R. Butcher and R. Davis – sent to PERTH; D.E. Albrecht – sent to CANB; P.C. Jobson – retained at NT). Duplicates will be distributed between these herbaria in due course.

At each herbarium, specimens were accessioned into the institution and species that were straightforward were identified without detailed examination. Specimens were identified using standard botanical resources (*Flora of Australia*, *Flora of Central Australia* and appropriate up-to-date keys and literature as available) and comparison with material held in the reference and research collections. A small number of specialist taxa or anomalous specimens (e.g. in *Corynotheca*, *Eremophila*, *Goodenia*, *Newcastelia*, *Tecticornia*, *Tephrosia*) were passed to experts in those groups for identification or confirmation. Some experts were outside the institution in which the specimens were held, necessitating an exchange of a small number of specimens between herbaria. Some specimens were also scanned and images sent to external specialists (e.g. Bruce Maslin, *Acacia*; Bill Barker, *Peplidium*).

Specimen identifications were collated at PERTH where nomenclature was checked and updated if necessary. Due to outdated published taxonomies and active unpublished research a handful of taxa were identified to non-current names, including excluded names. The taxonomic status of those collections was investigated further, sometimes with assistance from specialists (e.g. Robyn Barker, *Sida* issues). These investigations led to some significant taxonomic outcomes, such as determining that the phrase-named taxon *Sida* sp. sand dunes (A.A. Mitchell PRP1208), erected on the WA plant census in 2007 following the name's publication in a key to WA *Sida* (Barker 2007), is a later informal synonym of *Sida* sp. Western sand dunes (P.K. Latz 11980), a concept dating back to 1981 (as '*Sida* sp. A'; Barker 1981). This discovery has prevented inflation of taxon numbers in this report and will be reflected in AVH and APC in due course. The name *Sida* sp. sand dunes is to be removed from the WA plant census and replaced with *Sida* sp. Western sand dunes.

Taxa collected from the Kiwirrkurra IPA in 2015 were compared against those recorded in AVH from a polygon describing the IPA, as well as in Appendix D of Paltridge (2010), to produce an expanded species list (Appendix 1). It is worth noting that occurrence data retrieved through AVH contains errors, and that while considerable effort was taken to cross-reference taxonomies and distribution data when compiling the full species list, some specimens may still have been misidentified or inaccurately georeferenced. For example, a record of the mistletoe *Amyema pendula* subsp. *pendula* (*R. Helms s.n.*; Elder Expedition, 1891) was determined to be both taxonomically and spatially suspect with *A. pendula* not known from WA and the collection locality being given as Barrow Ranges, which are south of Warburton, itself some 400 km south of Kiwirrkurra. The name was therefore excluded from species lists, and the specimen flagged for curation attention by NSW through AVH. An additional 11 taxa were excluded from the AVH download for similar reasons (Appendix 1, Table 2).

As it was not possible to assess specimens outside PERTH that were identified only to 'sp.' within a genus it was not possibe to determine whether this ID meant that the specimen was poor and did not have the parts necessary for identification, whether it represented a known species but had not been identified in full, or whether it could not be matched to any known species and may be a novel taxon. These records were therefore retained, for the interest of land managers, but are presented in grey text in Apppendix 1, Table 1 and did not contribute to taxon numbers.

3. Results and Discussion

In summary, 585 vascular plant specimens were collected by the botanical team, representing 316 vascular plant taxa from 48 families (Figure 4). The five most speciose families collected in this expedition were Fabaceae (legumes; 55 taxa in 15 genera), Poaceae (grasses; 32 taxa in 12 genera), Chenopodiaceae (saltbushes/samphires; 28 taxa in 13 genera), Malvaceae (mallows; 25 taxa in 9 genera) and Goodeniaceae (fan-flowers; 21 taxa in 6 genera). Four accepted weed species were collected, including one (*Cenchrus echinatus*) listed under WA, NT and NSW legislation, and classed as problematic in Qld. A fifth taxon, *Cyperus hamulosus*, is listed as naturalised in WA, SA and Victoria; however, its status is uncertain in the NT (Northern Territory Government 2013). AVH records returned a fifth weed species (*Dactyloctenium aegyptium*), collected from the IPA in 2013. In addition,

seven liverwort specimens were collected, representing at least four species of *Riccia* (Ricciaceae). While all of these are widespread across Australia, none had previously been collected within the IPA.

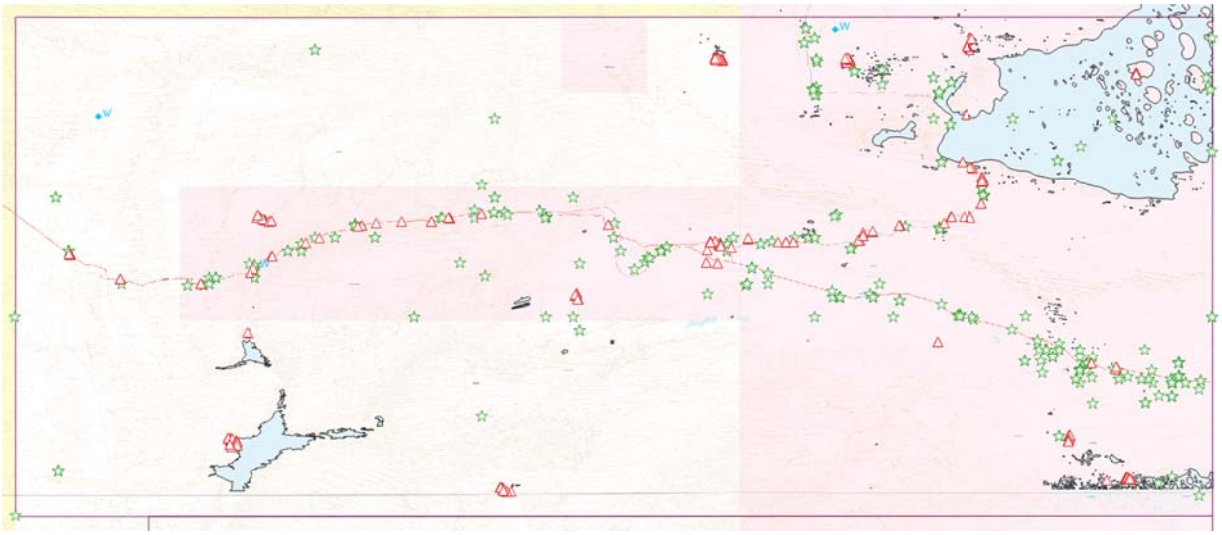

Figure 4. Map of Kiwirrkurra IPA showing the locations of vascular plant specimen records from AVH (1967–2013; green stars) and specimens collected on the Bush Blitz expedition (2015; red triangles). Wells (W) are shown in blue. In addition to being well-distributed along the east-west traverse of the IPA, Bush Blitz collections are also aggregated at sites in which intensive sampling of different habitats was undertaken.

No EPBC-listed plant species were collected during this Bush Blitz, but nine taxa with Priority (P) conservation-listing in Western Australia were: *Isotropis winneckei* (P1), *Rothia indica* subsp. *australis* (P1), *Eremophila pallida* (P2), *Goodenia virgata* (P2), *G. modesta* (P3), *Dampiera atriplicina* (P3), *Elatine macrocalyx* (P3), *Sauropus arenosus* (P3) and *Stackhousia clementii* (P3). A tenth Priority-listed taxon – *Atriplex flabelliformis* (P3) – was retrieved from AVH; however, the record is geospatially suspect and the specimen was most likely collected just east of the WA/NT border. As suitable habitat occurs on both sides of the border around Lake Makay, the record has been retained in the final species list, but in grey text; it was not, however, included in taxon counts.

A total of 435 taxa have now been recorded for Kiwirrkurra IPA. Of these, seven taxa are new for WA or PERTH, with eight new names to be erected on the WA vascular plant census. One of these – *Corymbia deserticola* subsp. *mesogeotica* – was not collected on the expedition but its occurrence in WA was confirmed through AVH records (WA specimens lodged at AD and CANB) and discussions with the collector; it was recently collected from the IPA on request, with material to be lodged at PERTH. In addition, one phrase name was removed from the census and replaced with an earlier informal synonym (i.e. *Sida* sp. sand dunes (A.A. Mitchell PRP1208) was removed and *Sida* sp. Western sand dunes (P.K. Latz 11980) was erected).

Of the collections made, 16 were known undescribed taxa (i.e. taxa having phrase names recognised in APC); ongoing specialist taxonomic interest in *Peplidium*, *Sida*, *Stackousia* and *Tephrosia* suggests formal publication of some of the collected species in these genera in the near future.

There were three potentially new taxa in *Acacia*, *Newcastelia* and *Triodia* collected, each of which requires additional material and further taxonomic study before their status can be resolved. Additional collections from a variety of genera were found to display some variation from accepted morphology, with multiple collections of some entities (e.g. *Indigofera georgei* variant) showing consistent differences from the norm. Future studies may find that some of these anomalous collections represent novel taxa (see Figure 5 for examples); however, it is also likely that some of these represent end-of-range variation that will require expansion of taxonomic concepts and descriptions.

A

B

Figure 5. Examples of taxa which are likely to be described as new following further research. A – *Tephrosia* aff. sp. sparse pinnae (C.R. Michel 2202); B – *Tephrosia rosea* [small, cuneate leaflet form], for which white-flowered variants were also collected.

3.1 Named taxa newly recorded for the reserve

As expected, given the availability of helicopters and hence the ability to access areas remote from the Gary Junction Road and well-collected areas in the Buck Hills, Dover Hills and around Lake Mackay, many new records were made from the IPA (Table 1). In many cases, these records fill a significant collection gap in PERTH specimen records, expanding the geographic range of some taxa by greater than 500 km in WA. Because the Great Sandy Desert bioregion extends across the WA/NT border, many taxa characteristic to it are distributed in both geopolitical areas. Thus, for some taxa, the nearest collection to a specimen that was highly disjunct from others in WA was located in the NT.

A total of 170 taxa were newly recorded for the Kiwirrkurra IPA, with 159 of these being formally named (Table 1) and 11 being phrase-named (Table 2).

Table 1. Formally named taxa newly recorded from Kiwirrkurra IPA	
Taxon	**Comment**
Acacia adsurgens	
Acacia aneura	
Acacia colei	
Acacia murrayana	
Acacia sibirica	
Allocasuarina decaisneana	
Alternanthera angustifolia	
Alyogyne pinoniana	
Amphipogon caricinus	
Amphipogon sericeus	
Bergia henshallii	
Bergia occultipetala	First record for WA; new name for WA census
Bergia trimera	
Brachyachne prostrata	
Brunonia australis	
Calandrinia balonensis	
Calandrinia reticulata	
Calocephalus platycephalus	
Calotis multicaulis	
Cassytha capillaris	
**Cenchrus biflorus*	
Chrysocephalum apiculatum subsp. *glandulosum*	
Cleome uncifera subsp. *microphylla*	
Corymbia opaca	
Corynotheca micrantha var. *divaricata*	
Corynotheca micrantha var. *gracilis*	
Crotalaria cunninghamii subsp. *sturtii*	
Cucumis argenteus	
Cullen cinereum	
[*]*Cyperus hamulosus*	
Dampiera dentata	
Dicrastylis beveridgei	
Dodonaea coriacea	

Dodonaea viscosa subsp. *angustissima*	
Dodonaea viscosa subsp. *mucronata*	
Drosera finlaysoniana	
Dysphania rhadinostachya subsp. *rhadinostachya*	
Einadia nutans subsp. *eremaea*	
Elatine macrocalyx	
Eragrostis laniflora	
Eragrostis setifolia	
Eragrostis speciosa	
Eremophea spinosa	
Eremophila glabra subsp. *glabra*	
Eremophila latrobei subsp. *latrobei*	
Eremophila maculata subsp. *maculata*	
Eremophila pallida	
Eremophila platythamnos subsp. *exotrachys*	
Eremophila willsii subsp. *integrifolia*	
Eriachne aristidea	
Eriachne lanata	
Eriachne mucronata	
Euphorbia australis var. *hispidula*	
Euphorbia australis var. *subtomentosa*	
Euphorbia biconvexa	
Euphorbia tannensis subsp. *eremophila*	
Euphorbia wheeleri	
Exocarpos sparteus	
Ficus brachypoda	
Fimbristylis caespitosa	
Frankenia cinerea	
Gompholobium polyzygum	
Goodenia armitiana	
Goodenia halophila	First record for WA; new name for WA census
Goodenia ? *lamprosperma*	
Goodenia microptera	
Goodenia triodiophila	
Gyrostemon ramulosa	

Hakea chordophylla	
Hakea leucoptera subsp. *sericipes*	
Halgania cyanea	
Halgania erecta	
Helichrysum luteoalbum	
Heliotropium curassavicum	
Heliotropium glabellum	
Heliotropium pachyphyllum	
Heliotropium tenuifolium	
Hibiscus burtonii	
Hibiscus leptocladus	
Hibiscus sturtii var. *grandiflorus*	
Hybanthus aurantiacus	
Indigofera georgei	
Indigofera linnaei	
Isotoma petraea	
Isotropis winneckei	
Lawrencia glomerata	
Marsilea hirsuta	
Myriophyllum verrucosum	
Neobassia astrocarpa	
Oldenlandia pterospora	
Orianthera centralis	
Paractaenum refractum	
Paraneurachne muelleri	
Paspalidium basicladum	
Paspalidium reflexum	
Pluchea dunlopii	
Pluchea ferdinandi-muelleri	
Pluchea rubelliflora	
Pluchea tetranthera	
Prostanthera striatiflora	
Psydrax latifolia	
Pterocaulon sphacelatum	
Ptilotus astrolasius	

Ptilotus macrocephalus	
Ptilotus schwartzii	
Ptilotus sessilifolius	
Rhagodia spinescens	
Salsola australis	
Santalum lanceolatum	
Sarcostemma viminale subsp. *australe*	
Sauropus arenosus	
Scaevola amblyanthera var. *centralis*	
Scaevola basedowii	
Scaevola collaris	
Scaevola parvifolia subsp. *parvifolia*	
Schenkia australis	
Schenkia clementii	
Schoenoplectus dissachanthus	
Sclerolaena clelandii	
Sclerolaena cuneata	
Sclerolaena diacantha	
Sclerolaena fimbriolata	
Sclerolaena parviflora	
Sclerolaena symoniana	
Senna artemisioides subsp. *alicia*	First record for WA; new name for WA census
Senna curvistyla	
Senna symonii	
Sida arenicola	
Sida cardiophylla	
Sida cunninghamii	
Sida fibulifera	
Sida rohlenae subsp. *rohlenae*	
Solanum centrale	
Solanum cleistogamum	
Sporobolus actinocladus	
Stemodia florulenta	
Stenopetalum decipiens	
Streptoglossa bubakii	

Streptoglossa decurrens	
Streptoglossa liatroides	
Streptoglossa odora	
Stylidium inaequipetalum	
Swainsonia tanamiensis	
Tecticornia halocnemoides subsp. *longispicata*	
Tecticornia aff. *halocnemoides* subsp. *longispicata*	
Tecticornia indica subsp. *leiostachya*	
Tecticornia pergranulata subsp. *elongata*	
Tecticornia tenuis	
Tecticornia undulata	
Tephrosia rosea s. lat. [small cuneate leaflet form]	
Tephrosia rosea ? var. *clementii*	
Trianthema turgidifolium	
Trichodesma zeylanicum var. *zeylanicum*	
Triglochin hexagona	
Triodia latzii	First record for WA; new name for WA census
Triodia pungens	
Triodia salina	
Triodia spicata	
Wahlenbergia caryophylloides	

3.2 Un-named or not formalised taxa

Sixteen established phrase-named taxa were collected, 11 of which were not previously known from Kiwirrkurra IPA. None of these taxa are currently conservation-listed; however, *Peplidium* sp. Tanami (P.K. Latz 11904) is being recommended for conservation assessment as a Priority 2 taxon in WA as part of the process of erecting the phrase name on the WA plant census. *Stackhousia* sp. Lake Mackay (P.K. Latz 12870) is thought to be restricted to gypsum outcrops in samphire vegetation communities on islands and edges of Lake Mackay (White *et al.* 2000); however, a fruiting collection from *c.* 4.5 km WSW of Yanneri Lake, Little Sandy Desert bioregion (PERTH 7013825), was made from similar habitat and has been tentatively identified as *S.* sp. Lake Mackay. This taxon requires further study and survey; it may require conservation listing.

Table 2. Putatively un-named or informal taxa collected from Kiwirrkurra IPA (in Bush Blitz 2015)		
Taxon	**Collecting number**	**Comment**
Acacia sp. Lake Mackay (P.K. Latz 12836)	PCJ 12062 PCJ 12154 PCJ 12169 RB 2019 RD 12685	Previously recorded.
Calotis sp. Carnarvon Range (D.J. Edinger & K.F. Kenneally D 2708 K 12243)	RD 12624	Not recorded previously.
Eragrostis eriopoda subsp. Sandy fireweed (P.K. Latz 12908)	PCJ 12109	First record for WA; new name for WA census. There are many taxonomic issues in *Eragrostis*, and a number of informal infraspecific taxa are recognised in *E. eriopoda*. A widespread and problematic complex.
Eragrostis sp. Limestone (P.K. Latz 5921)	DEA 14272 DEA 14467	Not recorded previously.
Halgania solanacea var. Mt Doreen (G.M. Chippendale 4206)	PCJ 12075 DEA 14437 RB 2090	Previously recorded.
Peplidium sp. Tanami (P.K. Latz 11904)	RB 2018 RB 2027 RD 12647	First record for WA; new name for WA census. Taxon has been informally recognised, and recognised as occurring in WA, since the early 1980s (Barker 1981, 1982), but no collections are held at PERTH and the name had not been erected on the census. Taxonomically relatively straightforward; can be readily distinguished from others by its four anthers (Barker 1981). To be described by W. Barker.
Sida sp. Excedentifolia (J.L. Egan 1925)	DEA 14450	Not recorded previously. One of two informally named taxa recognised out of the excluded (from WA) name *S. filiformis*. To be described by R. & W. Barker.
Sida sp. Pindan (B.G. Thompson 3398)	DEA 14431	Not recorded previously.
Sida sp. Rabbit Flat (P.K. Latz 12326)	PCJ 12157 DEA 14274	Not recorded previously.
Sida sp. Western sand dunes (P.K. Latz 11980)	RB 2026 RD 12629 PCJ 12055 PCJ 12173	Recorded previously under two different phrase names; new name for WA census. Studies during this project resulted in the WA phrase name *Sida* sp.

	DEA 14458	sand dunes (A.A. Mitchell PRP1208) being synonymised under this earlier informal name. To be described by R. Barker.
Stackhousia sp. Lake Mackay (P.K. Latz 12870)	PCJ 12178 DEA 14223	Recorded previously.
Stackhousia sp. Swollen gynophore (W.R. Barker 2041)	DEA 14446	Not recorded previously.
Stemodia sp. Tanami (P.K. Latz 8218)	RD 12631 DEA 14400	Not recorded previously.
Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)	RB 2059	Not recorded previously. A widespread taxon occurring across northern WA, the NT and into Qld. Variable in form with regional differences, and needs further study to determine if it's discrete from *T. benthamii*.
Tephrosia sp. deserts (J.R. Maconochie 1403)	RB 2003	Recorded previously. Widespread in the central deserts and apparently fire-responsive. Recently segregated from *T. sphaeospora* and very similar to *T. clementii*; to be described by R. Butcher.
Tephrosia sp. Willowra (G.M. Chippendale 4809)	RB 2108	Not recorded previously. A widespread taxon occurring across central Australia (NT & Qld; known by different informal names in these places), with <5 specimens known from WA. Closely allied to *T.* sp. OT Station (widespread in NT & Qld; <5 in WA) and *T. supina s. str.* (Pilbara). To be described by R. Butcher in collaboration with I. Cowie and L. Pedley following further study of the complex.

3.3 Putative new species (new to science)

Thirteen potentially new flowering plant taxa were collected during this Bush Blitz, with three specimens unable to be matched to any known species. It is unlikely that all of the entities in Table 3 will withstand closer taxonomic scrutiny, as some may simply represent extra variation in recognised taxa, or have been difficult to place for other reasons. However, it is clear that at least some of these will require naming as new taxa after further study.

Table 3. Putative new species (new to science) collected from Kiwirrkurra IPA

Taxon	Collecting number	Comment
Acacia sp.	DEA 14422	Few collections, in bud only. Images viewed by Bruce Maslin who can't place it based on combination of inflorescence form and leaf morphology/venation.
Newcastelia sp. [aff. *bracteosa*]	DEA 14286	Differs from *N. bracteosa* in its smaller leaves, which have the upper surface weakly bullate and only weakly dentritic to stellate-hairy, the hairs held ± against the leaf surface; greater separation of the flowers/young fruits into discrete units along the flowering spikes;

		little separation between the spike and the leaves. In early fruit; more collections needed.
Triodia sp. [aff. *angusta*/ *longiceps*]	DEA 14502	Leaf material sent to Matt Barrett for DNA analysis. Found to not be the same as an informal taxon '*A.* sp. Well 30' [M.D. Barrett] that is also problematic. Both are part of the *A. angusta*/*longiceps* complex. ITS puts both of them outside the *A. angusta* complex however, and there is a chance of DNA capture in the lineage. Although different, ITS is more similar to *A. angusta* group than *A. longiceps*. Morphologically, the papillate epidermal cells on the leaves are more like *A. longiceps*. Fertile material needed.
Complexes and anomalous collections (further studies required)		
Dampiera cinerea	PCJ 12108 PCJ 12118	Swale plants noted to be smaller in all parts than dune plants. *Dampiera cinerea*, *D. atriplicina* and *D. conospermoides* require further study to understand variation between the species.
Dicrastylis exsuccosa	DEA 14498	Long-haired variant.
Frankenia cordata	PCJ 12061 PCJ 12150 PCJ 12168 PCJ 12183	Close to *F. cinerea* and possibly a form of that species; hairs similar to *F. cordata* but bases of leaves not very cordate.
Indigofera georgei	PCJ 12021 PCJ 12033 PCJ 12056 PCJ 12106	Shorter staminal tubes than proposed by Wilson & Rowe (2015) for *I. georgei* (i.e. '≥ 5 mm') and most specimens are consistently 3-foliolate rather than 'usually 5–7 (rarely 3 or 9)'. Range ext. ~100-150 km. A potentially new taxon.
Osteocarpum salsuginosum	DEA 14513	Variant approaching *Sclerolaena urceolata*.
Sclerolaena crenata	PCJ 12182	Leaves short and retain their hairs longer than usual; fruit a perfect match.
Solanum centrale	PCJ 12095	Peduncles much shorter than normal.
Tecticornia halocnemoides subsp. ?*longispicata*	DEA 14225 DEA 14483	This species is widespread and variable with a number of ±recognisable forms; this form does not match typical subsp. *longispicata* (which may be elevated to species rank in the future).
Tephrosia rosea s. lat.	RB 1998 RB 2011	Small cuneate leaflet form; specimens of this form segregated at PERTH and DNA, but not phrase-named pending revisionary work. *Tephrosia rosea* is a widespread and variable species extending from WA's Pilbara across the northern NT and north-western Qld; the complex contains a number of named and phrase-named taxa (at different ranks). Flower colour variation noted with most plants (e.g. RB 1998) having typically purple flowers and a small population (e.g. RB 2011) having pink-cream flowers. A potentially new taxon.
Tephrosia aff. sp. sparse pinnae (C.R. Michel	RB 1991 RB 2051 RB 2052	*Tephrosia* sp. sparse pinnae is a poorly diagnosed taxon, at present known from a handful of collections in sandstone country in the North Kimberley (WA) and the NT. Specimens are generally poor,

2202)		with very few flowers and only juvenile fruits, making its taxonomic assessment difficult. Some very slender-leafleted specimens of *T. subpectinata* are undoubtedly included under this name in AVH records. Kiwirrkurra specimens are distinctive in their habitat (crests of sand dunes), larger leaflets, and very prominent, pungent stipules. A possible new taxon requiring further study.

3.4 Weed or pest species

Relatively few weeds were noted. Partly this was because we targeted areas remote from the Kiwirrkurra community, which were mostly accessed by helicopter, therefore reducing the probability of collecting common roadside weeds transported through the landscape by vehicles. The absence of cattle stocking on Kiwirrkurra is likely to also be a factor behind low weed numbers. None of the weeds recorded are listed under Commonwealth legislation; however, *Cenchrus echinatus* is recognised as a widespread noxious weed in Australia and is listed under the following State/Territory legislations:

- Western Australia: Prohibited (on the prohibited species list and not permitted entry into the state)
- Northern Territory: Class B (growth and spread to be controlled throughout all of the Territory) and Class C (not to be introduced into the Territory)
- New South Wales: Class 5 (restricted weed that must not be sold, bought or knowingly distributed throughout the entire state)

It is also considered a problem weed in Queensland, where its removal is recommended.

While *Cenchrus ciliaris* was a dominant species within the Kiwirrkurra community area, the others were relatively minor at the sites where they were recorded.

Cenchrus biflorus is currently limited in distribution but is clearly being moved along roadsides by graders.

Aerva javanica is native to Africa and south-west and southern Asia. The species was introduced into Australia in the 1880s to assist in the revegetation of degraded rangelands; now widespread across northern Australia, spreading by wind-borne seeds.

Cyperus hamulosus is listed as naturalised in WA (Western Australian Herbarium 1998–), SA (Government of South Australia 2007–) and Victoria (Royal Botanic Gardens Victoria 2015); however, its status is uncertain in the NT (Northern Territory Government 2013). Wilson (1981) reported that the species is native to Central Asia and Africa, and sporadically naturalised in inland Australia, probably being introduced with camels last century. In *FloraNT* (Northern Territory Government 2013) it is noted that southern NT populations appear to be native (and possibly a novel taxon), and D. Albrecht has observed that the species always occurs in the best quality wetlands and he doesn't believe it to be a weed (pers. comm. 6/6/2016). As the voucher specimen (DEA 14409) was collected in WA, it is regarded as a naturalised taxon in this report, albeit contentiously (i.e. marked as [*]).

Dactyloctenium aegyptium (Coastal Button Grass) was collected from the IPA in 2013 (Council of Heads of Australasian Herbaria 2015), illustrating the spread of this species from coastal to inland habitats.

Table 4. Weed species recorded in Kiwirrkurra IPA			
Pest/weed species	**Location sighted/observed**	**Indication of abundance**	**Comments**
**Aerva javanica*	Kiwirrkura township.	Common.	RD 12617 Collected previously from IPA.
**Cenchrus biflorus*	Nyinmi outstation and also along the Gary Junction Rd to the E and W of Nyinmi.	Localised near buildings, on edge of track and pull-off area. Can be locally common in disturbed areas.	DEA 14496 As with buffel (*C. ciliaris*) it is being spread further along roadsides by graders. First collection from IPA.
**Cenchrus ciliaris*	A serious weed in the township. Also present at Nyinmi outstation and probably occurs around other outstations in the IPA. Occurs as scattered patches along the Gary Junction Rd, particularly W of Kiwirrkurra.	Abundant in disturbed areas around the Kiwirrkurra community where it was the dominant species, and abundant around dwellings at Nyinmi.	PCJ 12019 DEA 14222 Collected previously from IPA.
**Cenchrus echinatus*	Only seen in domestic garden in Kiwirrkurra township.	Locally occasional.	DEA 14486; listed in WA, NT and NSW legislation, and problematic in QLD. Collected previously from IPA.
[*]*Cyperus hamulosus*	Margins of freshwater wetland, west-north-west of Lake Mackay.	Scattered. Range extension >200 km from nearest collection (in NT).	DEA 14409 Noted as a naturalised taxon in WA on FloraBase, but status is contentious. DEA has observed that it's always in the best quality wetlands (i.e. no other weeds present). First collection from IPA.
**Dactyloctenium aegyptium*	On red sand plain burned within last 3 years.	>50 plants seen in 100–1000 m^2 area; with other alien taxa.	Not collected; AVH records a 2013 collection (PERTH

			08718261). A highly significant range extension in WA from current coastal collections; central Australian collections known from the NT.

3.5 Vulnerable, threatened or endangered species

Relatively few taxa collected are conservation-listed under WA regulations, and none listed under the EPBC Act. Note, however, that this is partly a reflection of the relatively poor state of knowledge of plant distributions and abundances in the central deserts. On the one hand, some taxa currently listed in WA under Priority (IUCN Poorly Known) status are likely to be more widespread than currently known; on the other hand, some listed (and unlisted) taxa are likely to be rare and threatened.

Nine Priority-listed taxa were collected from the IPA: *Isotropis winneckei* (P1), *Rothia indica* subsp. *australis* (P1), *Eremophila pallida* (P2), *Goodenia virgata* (P2), *G. modesta* (P3), *Dampiera atriplicina* (P3), *Elatine macrocalyx* (P3), *Sauropus arenosus* (P3) and *Stackhousia clementii* (P3).

Atriplex flabelliformis, which is conservation-listed in WA (P3), appeared in AVH records for the IPA but its occurrence there cannot be confirmed. An apparent duplicate record (AD 96050029) occurs in the NT and the data quality assertions for the IPA specimen (MEL 0609762A) show that the record's coordinates don't match the supplied state/territory name. As the collection was made from near the edge of Lake Mackay, however, it is worth considering that the species may occur in the IPA near the NT border.

Table 5. Vulnerable, threatened or endangered species from Kiwirrkurra IPA

Species	Listing status and level (EBPC, State/Territory)	Location sighted/observed	Indication of abundance
Isotropis winneckei	WA Priority 1	-22.7947, 128.1267 (PCJ 12115)	Infrequent.
Rothia indica subsp. *australis*	WA Priority 1	-22.655, 128.4275 (DEA 14509)	Rare.
Eremophila pallida	WA Priority 2	-22.7438, 126.6083 (DEA 14427)	Infrequent.
Dampiera atriplicina	WA Priority 3	-21.2403, 127.0424 (RB 2066) -23.305, 126.5391 (DEA 14464) -22.7513, 127.0886 (DEA 14490) -22.8469, 126.643 (DEA 14497)	Relatively locally frequent.
Elatine macrocalyx	WA Priority 3	-22.3197, 128.3852	Frequent.

		(DEA 14401)	
Goodenia modesta	WA Priority 3	-22.3601, 128.0841 (RD 12661)	Locally frequent.
Sauropus arenosus	WA Priority 3	-22.9035, 126.2652 (RD 12688)	Occasional, 10–15 plants seen. Fire-responsive.
Stackhousia clementii	WA Priority 3	-22.9552, 127.4119 (DEA 14258)	Occasional.

3.6 Range extensions

Five taxa currently known to occur in the NT were collected for the first time in WA during this Bush Blitz. These, and three other taxa known from WA material held at other herbaria, are to be newly erected on the WA plant census (Table 6.1). Many specimens collected represent range extensions within the Gibson and Great Sandy Desert bioregions, some being the first collections from these bioregions in their entirety, or within WA (for GSD). Of the taxa already known from WA, there were 17 significant range extensions (2 x >500 km; 3 x ~/>400 km; 2 x ~/>300 km; 9 x ~/>200 km; 1 x ~/>100). Of these, 1 x >400 km and 1 x ~300 km are extensions from WA collections only, with closer collections occurring in the NT.

These range extensions are consistent with the relatively poor understanding of distributions in the central desert region and particularly the low state of knowledge for areas away from major thoroughfares. While significant (i.e. >100 km; very poorly known for WA etc.) range extensions are presented below (Table 6.2), many of the taxa listed in Table 1 will be range extensions of varying extents.

Table 6.1. New for WA		
Goodenia halophila	RB 2008, RB 2015	New name for WA plant census. First record for WA.
Peplidium sp. Tanami (P.K. Latz 11904)	RB 2018, RB 2027, RD 12647	New name for WA plant census. First record for WA.
Senna artemisioides subsp. *alicia*	RD 12701	New name for WA plant census. First record for WA.
Triodia latzii	DEA 14425	New name for WA plant census. First record for WA.
Bergia occultipetala	DEA 14511	New name for WA plant census. First record for WA.
Sida sp. Western Sand Dunes (P.K. Latz 11980)	RB 2026, RD 12629, PCJ 12055, PCJ 12173, DEA 14458	New name for WA plant census. First WA record for PERTH [WA specimens held at DNA/NT].
Eragrostis eriopoda subsp. Sandy fireweed (P.K. Latz 12908)	PCJ 12109	New name for WA plant census. Specimen to be lodged at CANB [WA specimens held at DNA/NT].

Triumfetta winneckeana	RB 2101, PCJ 12089, DEA 14263	First WA record for PERTH. [WA specimens held at DNA/NT].
Corymbia deserticola subsp. *mesogeotica*	No collection (AVH record)	New name for WA plant census [no WA specimen at PERTH; held AD, CANB]. Confirmed with collector, D. Nicolle. Specimens for PERTH collected by P.K. Latz and D.E. Albrecht from Kiwirrkurra IPA, June 2016.

Table 6.2. Significant range extensions and distributions

Wahlenbergia caryophylloides	DEA 14298	Range ext. >500 km. First record for GD or GSD.
Triglochin hexagona	RD 12649	Range ext. >500 km [from WA records]. First record for GD or GSD.
Schenkia clementii	RD 12650	Range ext. >400 km. First record for GD or GSD.
Eriachne lanata	DEA 14426	Range ext. >400 km. Eastern limit.
Sclerolaena fimbriolata	RB 2079	Range ext. ~400 km.
Stemodia florulenta	RB 2009	Range ext. >300 km. First record for GD or GSD.
Indigofera linnaei	RD 12632	Range ext. ~300 km [from WA records]. First record for GD.
Dodonaea viscosa subsp. *mucronata*	RB 2116	Range ext. >200 km. First record for GD or GSD.
Sclerolaena parviflora	RB 1995	Range ext. >200 km. Second record for GD; first record for GSD.
Calotis multicaulis	RB 2112	Range ext. >200 km. Second record for GD; first record for GSD.
Euphorbia biconvexa	RD 12655a	Range ext. >200 km. First record for GSD in WA.
Swainsona tanamiensis	RB 2006	Range ext. >200 km. First record for GD or GSD (in WA; @ PERTH).
Dicrastylis beveridgei	RD 12687	Range ext. ~200 km. First record for GD or GSD.
Einadia nutans subsp. *eremaea*	RD 12690	Range ext. ~200 km. First record for GD or GSD (in WA)
Fimbristylis caespitosa	DEA 14299	Range ext. ~200 km. Southern limit in WA.
Eremophila forrestii subsp. *forrestii*	RD 12673	Range ext. ~200 km.
Gompholobium polyzygum	RB 2005	Range ext. ~100–150 km. Second record for GSD (in WA).
Centipeda racemosa	RB 2030	Third record for WA.
Stemodia sp. Tanami	RD 12631	Third record for WA.

(P.K. Latz 8218)		
Dampiera dentata	RB 2055	First record for GSD.
Isotoma petraea	RD 12665	Second record for GSD in WA.

4. Information on species lists

Records of previously collected vascular plant taxa were derived from AVH (Council of Heads of Australasian Herbaria 2015) and from Paltridge (2010). AVH data contained numerous errors and inconsistencies; thorough cleaning was required before it could be used to generate a full species list. Nomenclature has been updated in this report where it was found to be out of date, and taxonomically suspect records have been indicated (e.g. *Atriplex flabelliformis*) or excluded (e.g. *Amyema pendula* subsp. *pendula*). Details for all specimens collected by P.C. Jobson are now available through AVH, with D.E. Albrecht records entered into the CANB database. R. Butcher and R. Davis specimens are currently in a temporary database at PERTH, pending their mounting and incorporation in WAHERB.

5. Information for land managers

In general, the areas surveyed were all of high quality, and represented good examples of the vegetation of the Great Sandy Desert and Gibson Desert bioregions. Weed sightings were low and were centred on areas of human-mediated disturbance and vehicle movement (i.e. Kiwirrkurra township and Nyinmi outstation, and roadsides nearby). Areas where vehicles are parked after coming in from outside areas should be monitored for weeds and control measures implemented. Road grading actions require review and education to prevent further spread of weeds out from Kiwirrkurra and Nyinmi. Particular attention needs to be paid to eradicating the noxious weed *Cenchrus echinatus* (Burr Grass, Mossman River Grass) from the Kiwirrkurra township, where it is currently only known from a single site. Monitoring and eradication of *Dactyloctenium aegyptium* is also recommended.

Dedicated surveys for *Stackhousia* sp. Lake Mackay on gypsophilous soils would be highly useful to determine its true distribution range and plant numbers at individual populations. These data would assist in its conservation status assessment.

6. Conclusions

This was a successful Bush Blitz for the botanical collections. Its success is measurable by the large number (170) of new records for the IPA, including five first records for WA, the addition of eight new names to the WA vascular plant census, the identification of significant range extensions for a number of taxa, and the collection of a dozen or so taxonomically interesting specimens, some at least of which will undoubtedly be found to be new under closer examination.

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Appendices

Appendix 1. List of vascular plants occurring on Kiwirrkurra IPA.

Reserve Name: Kiwirrkurra Indigenous Protected Area

Number of taxa: 435 (including subspecies and varieties but without double counting).

Appendix 1, Table 1. Full vascular plant species list for Kiwirrkurra IPA compiled from AVH records, Appenix D of Paltridge (2010) and Bush Blitz collections (2015).

Family	Species	Common name	New record	Putative new species	EPBC Listed	State or Territory Listed	Weed or Pest
Aizoaceae	*Trianthema glossostigmum*						
Aizoaceae	*Trianthema pilosum*						
Aizoaceae	*Trianthema turgidifolium*		✓				
Aizoaceae	*Trianthema* sp.						
Amaranthaceae	*Aerva javanica*	Kapok bush					✓
Amaranthaceae	*Alternanthera angustifolia*		✓				
Amaranthaceae	*Ptilotus arthrolasius*						
Amaranthaceae	*Ptilotus astrolasius*		✓				
Amaranthaceae	*Ptilotus axillaris*	Mat Mulla Mulla					
Amaranthaceae	*Ptilotus calostachyus*	Weeping Mulla Mulla					
Amaranthaceae	*Ptilotus clementii*	Tassel Top					
Amaranthaceae	*Ptilotus fusiformis*						
Amaranthaceae	*Ptilotus latifolius*	Tangled Mulla Mulla					
Amaranthaceae	*Ptilotus macrocephalus*	Featherheads	✓				
Amaranthaceae	*Ptilotus nobilis* subsp. *nobilis*	Pink Mulla Mulla; Lamb's Tail					
Amaranthaceae	*Ptilotus obovatus*	Cotton bush					
Amaranthaceae	*Ptilotus schwartzii*						

Amaranthaceae	*Ptilotus sessilifolius*		✓				
Amaranthaceae	*Ptilotus* sp.						
Amaranthaceae	*Surreya diandra*						
Apocynaceae	*Carissa lanceolata* [*spinarum* in some states]	Conkerberry; Bush Plum					
Apocynaceae	*Sarcostemma viminale* subsp. *australe*		✓				
Asparagaceae	*Thysanotus exiliflorus*	[if ID OK = v large range extension]					
Asteraceae	*Angianthus cyathifer*						
Asteraceae	*Brachyscome cilliaris*	Variable Daisy					
Asteraceae	*Brachyscome* sp.						
Asteraceae	*Calocephalus platycephalus*	Billybuttons	✓				
Asteraceae	*Calotis erinacea*	Tangled Burr-daisy					
Asteraceae	*Calotis multicaulis*	Many-stemmed Burr-daisy	✓				
Asteraceae	*Calotis* sp. Carnarvon Range (D.J. Edinger & K.F. Kenneally D 2708 K 12243)		✓				
Asteraceae	*Centipeda racemosa*	Snuffweed					
Asteraceae	*Chrysocephalum apiculatum*	Common Everlasting					
Asteraceae	*Chrysocephalum apiculatum* subsp. *glandulosum*		✓				
Asteraceae	*Chrysocephalum eremaeum*						
Asteraceae	*Chrysocephalum semipapposum*	Clustered Everlasting					
Asteraceae	*Helichrysum luteoalbum*	Jersey Cudweed	✓				

Asteraceae	*Ixiochlamys filicifolia*						
Asteraceae	*Myriocephalus rudallii*						
Asteraceae	*Olearia stuartii*						
Asteraceae	*Peripleura virgata*						
Asteraceae	*Pluchea dunlopii*		✓				
Asteraceae	*Pluchea ferdinandi-muelleri*		✓				
Asteraceae	*Pluchea rubelliflora*		✓				
Asteraceae	*Pluchea tetranthera*		✓				
Asteraceae	*Podolepis eremaea*						
Asteraceae	*Podolepis* sp.						
Asteraceae	*Pterocaulon serrulatum* var. *velutinum*						
Asteraceae	*Pterocaulon sphacelatum*	Apple Bush	✓				
Asteraceae	*Rhodanthe tietkensii*						
Asteraceae	*Rutidosis helichrysoides* subsp. *helichrysoides*						
Asteraceae	*Streptoglossa bubakii*		✓				
Asteraceae	*Streptoglossa decurrens*		✓				
Asteraceae	*Streptoglossa liatroides*		✓				
Asteraceae	*Streptoglossa macrocephala*						
Asteraceae	*Streptoglossa odora*		✓				
Asteraceae	*Vittadinia eremaea*						
Boraginaceae	*Halgania cyanea*	Rough Halgania	✓				
Boraginaceae	*Halgania erecta*		✓				
Boraginaceae	*Halgania solanacea*						

Boraginaceae	*Halgania solanacea* var. Mt Doreen (G.M. Chippendale 4206)						
Boraginaceae	*Halgania* sp. A Kimberley Flora (H.A. Johnson 5123)						
Boraginaceae	*Heliotropium curassavicum*	Smooth Heliotrope	✓				
Boraginaceae	*Heliotropium epacrideum*						
Boraginaceae	*Heliotropium glabellum*		✓				
Boraginaceae	*Heliotropium glanduliferum*						
Boraginaceae	*Heliotropium ovalifolium*	Native Heliotrope					
Boraginaceae	*Heliotropium pachyphyllum*		✓				
Boraginaceae	*Heliotropium tenuifolium*	Mamukata	✓				
Boraginaceae	*Trichodesma zeylanicum* var. *zeylanicum*		✓				
Brassicaceae	*Stenopetalum decipiens*		✓				
Campanulaceae	*Isotoma petraea*	Rock Isotome	✓				
Campanulaceae	*Wahlenbergia caryophylloides*		✓				
Casuarinaceae	*Allocasuarina decaisneana*	Desert Oak	✓				
Celastraceae	*Macgregoria racemigera*	Snow Flower; Carpet of Snow					
Celastraceae	*Stackhousia clementii*					P3	
Celastraceae	*Stackhousia* sp. Lake Mackay (P.K. Latz 12870)						
Celastraceae	*Stackhousia* sp. Swollen gynophore (W.R. Barker 2041)		✓				

Chenopodiaceae	*Atriplex flabelliformis*					P3	
Chenopodiaceae	*Atriplex vesicaria*	Bladder Saltbush					
Chenopodiaceae	*Dissocarpus paradoxus*	Curious Saltbush					
Chenopodiaceae	*Dysphania kalpari*	Rat's Tail					
Chenopodiaceae	*Dysphania platycarpa*						
Chenopodiaceae	*Dysphania rhadinostachya* subsp. *rhadinostachya*		✓				
Chenopodiaceae	*Einadia nutans* subsp. *eremaea*	Climbing Saltbush	✓				
Chenopodiaceae	*Enchylaena tomentosa*	Barrier Saltbush					
Chenopodiaceae	*Eremophea spinosa*		✓				
Chenopodiaceae	*Maireana georgei*	Satiny Bluebush; Golden Bluebush					
Chenopodiaceae	*Maireana luehmannii*						
Chenopodiaceae	*Maireana planifolia*	Low Bluebush					
Chenopodiaceae	*Maireana tomentosa* subsp. *tomentosa*						
Chenopodiaceae	*Neobassia astrocarpa*		✓				
Chenopodiaceae	*Osteocarpum salsuginosum*						
Chenopodiaceae	*Rhagodia spinescens*	Spiny Saltbush	✓				
Chenopodiaceae	*Salsola australis*		✓				
Chenopodiaceae	*Sclerolaena clelandii*		✓				
Chenopodiaceae	*Sclerolaena cornishiana*	Cartwheel Burr					
Chenopodiaceae	*Sclerolaena crenata*						

Chenopodiaceae	*Sclerolaena cuneata*	Yellow Bindii	✓				
Chenopodiaceae	*Sclerolaena deserticola*						
Chenopodiaceae	*Sclerolaena diacantha*	Grey Copperburr	✓				
Chenopodiaceae	*Sclerolaena fimbriolata*		✓				
Chenopodiaceae	*Sclerolaena lanicuspis*	Spinach Burr; Copper Burr					
Chenopodiaceae	*Sclerolaena parviflora*	Small-flower Saltbush	✓				
Chenopodiaceae	*Sclerolaena symoniana*		✓				
Chenopodiaceae	*Sclerolaena urceolata*	Squash Bush					
Chenopodiaceae	*Tecticornia calyptrata*						
Chenopodiaceae	*Tecticornia halocnemoides* subsp. *longispicata*		✓				
Chenopodiaceae	*Tecticornia* aff. *halocnemoides* subsp. *longispicata*		✓				
Chenopodiaceae	*Tecticornia indica* subsp. *leiostachya*	Samphire	✓				
Chenopodiaceae	*Tecticornia pergranulata* subsp. *elongata*		✓				
Chenopodiaceae	*Tecticornia tenuis*		✓				
Chenopodiaceae	*Tecticornia undulata*		✓				
Chenopodiaceae	*Tecticornia verrucosa*						
Cleomaceae	*Cleome uncifera* subsp. *microphylla*		✓				
Convolvulaceae	*Bonamia erecta*						
Convolvulaceae	*Evolvulus alsinoides*	Tropical Speedwell					
Convolvulaceae	*Ipomoea polpha* subsp. *latzii*	Morning Glory					
Cucurbitaceae	*Cucumis argenteus*		✓				

Cyperaceae	*Bulbostylis barbata*						
Cyperaceae	*Cyperus blakeanus*						
Cyperaceae	*Cyperus concinnus*						
Cyperaceae	*Cyperus cunninghamii*						
Cyperaceae	*Cyperus hamulosus*		✓				?
Cyperaceae	*Cyperus rigidellus*						
Cyperaceae	*Fimbristylis caespitosa*		✓				
Cyperaceae	*Fimbristylis dichotoma*	Common Fringe-rush; Eight Day Grass					
Cyperaceae	*Fimbristylis eremophila*						
Cyperaceae	*Schoenoplectus dissachanthus*		✓				
Droseraceae	*Drosera finlaysoniana*		✓				
Elatinaceae	*Bergia ammannioides*	Water-fire					
Elatinaceae	*Bergia henshallii*		✓				
Elatinaceae	*Bergia occultipetala*		✓				
Elatinaceae	*Bergia perennis*						
Elatinaceae	*Bergia perennis* subsp. *obtusifolia*						
Elatinaceae	*Bergia trimera*		✓				
Elatinaceae	*Elatine macrocalyx*		✓			P3	
Euphorbiaceae	*Euphorbia albrechtii*						
Euphorbiaceae	*Euphorbia australis* var. *hispidula*		✓				
Euphorbiaceae	*Euphorbia australis* var. *subtomentosa*		✓				
Euphorbiaceae	*Euphorbia biconvexa*		✓				
Euphorbiaceae	*Euphorbia boophthona*						
Euphorbiaceae	*Euphorbia*	Caustic Weed					

	drummondii						
Euphorbiaceae	*Euphorbia tannensis* subsp. *eremophila*	Desert Spurge	✓				
Euphorbiaceae	*Euphorbia wheeleri*		✓				
Euphorbiaceae	*Euphorbia* ? *wheeleri*		✓				
Euphorbiaceae	*Euphorbia* sp.						
Fabaceae	*Acacia adoxa* var. *adoxa*	Grey Whorled Wattle					
Fabaceae	*Acacia adsurgens*		✓				
Fabaceae	*Acacia ancistrocarpa*	Fitzroy Wattle					
Fabaceae	*Acacia aneura*	Mulga	✓				
Fabaceae	*Acacia aptaneura*	Slender Mulga					
Fabaceae	*Acacia colei*		✓				
Fabaceae	*Acacia cowleana*	Halls Creek Wattle					
Fabaceae	*Acacia cuthbertsonii* subsp. *cuthbertsonii*						
Fabaceae	*Acacia dictyophleba* (wispy variant)	Sandhill Wattle					
Fabaceae	*Acacia dictyophleba / melleodora*						
Fabaceae	*Acacia dictyophleba*						
Fabaceae	*Acacia elachantha*						
Fabaceae	*Acacia elachantha* (silver hairy variant)						
Fabaceae	*Acacia gilesiana*	Giles' Wattle					
Fabaceae	*Acacia grasbyi*	Miniritchie					
Fabaceae	*Acacia hilliana*	Hill's Tabletop Watttle					
Fabaceae	*Acacia*	Baderi; Corky					

	inaequilatera	Kanji					
Fabaceae	*Acacia ligulata*	Umbrella Bush; Dune Wattle					
Fabaceae	*Acacia lysiphloia*	Turpentine Wattle					
Fabaceae	*Acacia macdonnellensis* subsp. *macdonnellensis*						
Fabaceae	*Acacia maitlandii*	Maitland's Wattle					
Fabaceae	*Acacia melleodora*	Scented Wax Wattle					
Fabaceae	*Acacia monticola*	Gawar; Red Wattle					
Fabaceae	*Acacia murrayana*	Sandplain Wattle	✓				
Fabaceae	*Acacia paraneura*	Weeping Mulga					
Fabaceae	*Acacia pruinocarpa*	Gidgee; Black Gidgee					
Fabaceae	*Acacia pteraneura*	Broad-wing Mulga					
Fabaceae	*Acacia rhodophloia*	Minni Ritchi					
Fabaceae	*Acacia sericophylla*	Cork-bark Wattle					
Fabaceae	*Acacia sibirica*	Bastard Mulga	✓				
Fabaceae	*Acacia* sp. Lake Mackay (P.K. Latz 12836)						
Fabaceae	*Acacia stipuligera*						
Fabaceae	*Acacia tetragonophylla*	Kurara					
Fabaceae	*Acacia wiseana*						
Fabaceae	*Acacia* sp. (DEA 14422)		✓	✓			
Fabaceae	*Aenictophyton reconditum* subsp. *reconditum*						
Fabaceae	*Aeschynomene*	Budda Pea					

	indica						
Fabaceae	*Crotalaria cunninghamii* subsp. *cunninghamii*	Green Birdflower					
Fabaceae	*Crotalaria cunninghamii* subsp. *sturtii*		✓				
Fabaceae	*Crotalaria eremaea* subsp. *strehlowii*	Bluebush Pea					
Fabaceae	*Crotalaria medicaginea* var. *neglecta*	[very disjunct]					
Fabaceae	*Cullen cinereum*		✓				
Fabaceae	*Cullen martinii*						
Fabaceae	*Gompholobium polyzygum*		✓				
Fabaceae	*Gompholobium simplicifolium*						
Fabaceae	*Indigofera georgei*	Bovine Indigo	✓				
Fabaceae	*Indigofera linnaei*	Birdsville Indigo	✓				
Fabaceae	*Indigofera monophylla*						
Fabaceae	*Isotropis atropurpurea*	Poison Sage					
Fabaceae	*Isotropis winneckei*		✓			WA P1	
Fabaceae	*Kennedia prorepens*						
Fabaceae	*Lamarchea sulcata*						
Fabaceae	*Leptosema chambersii*						
Fabaceae	*Petalostylis cassioides*						
Fabaceae	*Rothia indica* subsp. *australis*					P1	
Fabaceae	*Senna artemisioides* subsp. *alicia*		✓				
Fabaceae	*Senna artemisioides* subsp. *helmsii*	Blunt-leaved Cassia					

Fabaceae	*Senna artemisioides* subsp. *helmsii* x subsp. *oligophylla*						
Fabaceae	*Senna artemisioides* subsp. *oligophylla*	Blunt-leaved Cassia					
Fabaceae	*Senna artemisioides* subsp. *qudrifolia*						
Fabaceae	*Senna curvistyla*		✓				
Fabaceae	*Senna glutinosa* subsp. *glutinosa*						
Fabaceae	*Senna glutinosa* subsp. *pruinosa*	White Cassia					
Fabaceae	*Senna glutinosa* subsp. x *luerssenii*						
Fabaceae	*Senna notabilis*	Cockroach Bush					
Fabaceae	*Senna sericea*						
Fabaceae	*Senna symonii*		✓				
Fabaceae	*Senna venusta*						
Fabaceae	*Swainsona cyclocarpa*						
Fabaceae	*Swainsona formosa*	Sturts Desert Pea					
Fabaceae	*Swainsona microphylla*	Small-leaf Swainsona					
Fabaceae	*Swainsona phacoides*	Dwarf Swainsona					
Fabaceae	*Swainsonia tanamiensis*		✓				
Fabaceae	*Swainsonia villosa*						
Fabaceae	*Swainsona* sp.						
Fabaceae	*Tephrosia rosea* var. *rosea*	Flinders River Poison					
Fabaceae	*Tephrosia rosea* s. lat. [small cuneate leaflet form]		✓	✓			
Fabaceae	*Tephrosia rosea* ? var. *clementii*		✓				

Fabaceae	*Tephrosia* sp. D Kimberley Flora (R.D. Royce 1848)		✓				
Fabaceae	*Tephrosia* sp. deserts (J.R. Maconochie 1403)						
Fabaceae	*Tephrosia* sp. Dunes (J.R.Maconochie 938)						
Fabaceae	*Tephrosia* aff. sp. sparse pinnae (C.R. Michel 2202)		✓				
Fabaceae	*Tephrosia* sp. Willowra (G.M. Chippendale 4809)		✓				
Fabaceae	*Tephrosia sphaerospora*	Mulga Trefoil					
Fabaceae	*Tephrosia* sp.						
Fabaceae	*Thinicola incana*						
Fabaceae	*Zornia albiflora*						
Frankeniaceae	*Frankenia cinerea*		✓				
Frankeniaceae	*Frankenia cordata*	Heart Leaves Frankenia					
Gentianaceae	*Schenkia australis*		✓				
Gentianaceae	*Schenkia clementii*		✓				
Goodeniaceae	*Brunonia australis*	Native Cornflower	✓				
Goodeniaceae	*Dampiera atriplicina*					WA P3	
Goodeniaceae	*Dampiera candicans*						
Goodeniaceae	*Dampiera cinerea*						
Goodeniaceae	*Dampiera ? cinerea*		✓				
Goodeniaceae	*Dampiera dentata*		✓				
Goodeniaceae	*Goodenia armitiana*		✓				
Goodeniaceae	*Goodenia azurea*						
Goodeniaceae	*Goodenia azurea* subsp. *hesperia*						
Goodeniaceae	*Goodenia halophila*		✓				

Goodeniaceae	*Goodenia* ? *lamprosperma*		✓				
Goodeniaceae	*Goodenia lyrata*						
Goodeniaceae	*Goodenia maideniana*						
Goodeniaceae	*Goodenia microptera*		✓				
Goodeniaceae	*Goodenia modesta*					WA P3	
Goodeniaceae	*Goodenia triodiophila*		✓				
Goodeniaceae	*Goodenia vilmoriniae*						
Goodeniaceae	*Goodenia virgata*						
Goodeniaceae	*Goodenia* sp.						
Goodeniaceae	*Lechenaultia lutescens*						
Goodeniaceae	*Lechenaultia striata*						
Goodeniaceae	*Scaevola amblyanthera* var. *centralis*		✓				
Goodeniaceae	*Scaevola basedowii*		✓				
Goodeniaceae	*Scaevola collaris*		✓				
Goodeniaceae	*Scaevola parvifolia* subsp. *parvifolia*	Camel weed	✓				
Goodeniaceae	*Scaevola spinescens*	Currant Bush					
Goodeniaceae	*Velleia connata*	Cup Velleia					
Goodeniaceae	*Velleia panduriformis*	Cabbage Poison; Pindal Poison					
Gyrostemonaceae	*Codonocarpus cotinifolius*	Bell-fruit Tree					
Gyrostemonaceae	*Gyrostemon ramulosus*	Corkybark	✓				
Gyrostemonaceae	*Gyrostemon tepperi*						
Haloragaceae	*Haloragis gossei* var. *gossei*						
Haloragaceae	*Gonocarpus eremophilus*						

Haloragaceae	*Myriophyllum verrucosum*	Red Water Milfoil	✓				
Hemerocallidaceae	*Corynotheca micrantha* var. *divaricata*	Sand Lily	✓				
Hemerocallidaceae	*Corynotheca micrantha* var. *gracilis*	Sand Lily	✓				
Juncaginaceae	*Triglochin hexagona*	Six-point Arrowgrass	✓				
Juncaginaceae	*Triglochin nana*						
Lamiaceae	*Clerodendrum floribundum*	Lollybush					
Lamiaceae	*Clerodendrum* sp.						
Lamiaceae	*Dicrastylis beveridgei*		✓				
Lamiaceae	*Dicrastylis doranii*						
Lamiaceae	*Dicrastylis exsuccosa*						
Lamiaceae	*Newcastelia cephalantha*						
Lamiaceae	*Newcastelia cladotricha*	Lambs' Tails					
Lamiaceae	*Newcastelia spodiotricha*						
Lamiaceae	*Newcastelia* sp. (DEA 14286)		✓	✓			
Lamiaceae	*Pityrodia loricata*						
Lamiaceae	*Prostanthera striatiflora*	Striped Mintbush; Striated Mintbush	✓				
Lamiaceae	*Quoya loxocarpa*						
Lauraceae	*Cassytha capillaris*		✓				
Loganiaceae	*Orianthera centralis*		✓				
Malvaceae	*Abutilon lepidum*						
Malvaceae	*Abutilon leucopetalum*	Desert Chinese Lantern					
Malvaceae	*Abutilon*	Desert Chinese					

	otocarpum	Lantern					
Malvaceae	*Alyogyne pinoniana*	Sand Hibiscus	✓				
Malvaceae	*Androcalva loxophylla*						
Malvaceae	*Corchorus sidoides* subsp. *sidoides*	Flannel Weed					
Malvaceae	*Corchorus sidoides* subsp. *vermicularis*						
Malvaceae	*Corchorus walcottii*	Woolly Corchorus					
Malvaceae	*Hibiscus arenicola*						
Malvaceae	*Hibiscus burtonii*		✓				
Malvaceae	*Hibiscus leptocladus*		✓				
Malvaceae	*Hibiscus sturtii* var. *grandiflorus*	Sturt's Hibiscus	✓				
Malvaceae	*Hibiscus sturtii* var. *platychlamys*	Sturt's Hibiscus					
Malvaceae	*Hibiscus sturtii* var. *truncatus*	Sturt's Hibiscus					
Malvaceae	*Keraudrenia velutina* subsp. *elliptica*						
Malvaceae	*Lawrencia glomerata*		✓				
Malvaceae	*Lawrencia squamata*	Thornny Lawrencia					
Malvaceae	*Lawrencia viridigrisea*						
Malvaceae	*Sida arenicola*		✓				
Malvaceae	*Sida cardiophylla*		✓				
Malvaceae	*Sida cunninghamii*		✓				
Malvaceae	*Sida echinocarpa*						
Malvaceae	*Sida fibulifera*	Silver Sida	✓				
Malvaceae	*Sida rohlenae* subsp. *rohlenae*		✓				
Malvaceae	*Sida* sp. Excedentifolia (J.L. Egan 1925)		✓				

Malvaceae	*Sida* sp. Pindan (B.G. Thompson 3398)		✓				
Malvaceae	*Sida* sp. Rabbit Flat (P.K. Latz 12326)		✓				
Malvaceae	*Sida* sp. Western Sand Dunes (P.K. Latz 11980)						
Malvaceae	*Sida* sp.						
Malvaceae	*Triumfetta deserticola*						
Malvaceae	*Triumfetta winneckeana*						
Marsileaceae	*Marsilea hirsuta*	Nardoo	✓				
Menispermaceae	*Tinospora smilacina*	Snake Vine					
Molluginaceae	*Glinus orygioides*	Desert Carpet-weed					
Moraceae	*Ficus brachypoda*		✓				
Myrtaceae	*Aluta maisonneuvei* subsp. *maisonneuvei*						
Myrtaceae	*Calytrix carinata*						
Myrtaceae	*Corymbia aspera*	Rough-leaf Range Gum					
Myrtaceae	*Corymbia candida* subsp. *dipsodes*						
Myrtaceae	*Corymbia chippendalei*	Sand-dune Bloodwood					
Myrtaceae	*Corymbia deserticola* subsp. *mesogeotica* [not on WACensus]						
Myrtaceae	*Corymbia opaca*		✓				
Myrtaceae	*Corymbia zygophylla*						
Myrtaceae	*Eucalyptus gamophylla*	Twin-leaf Mallee; Blue Mallee					
Myrtaceae	*Eucalyptus normantonensis*	Greenvale Box					

Myrtaceae	*Eucalyptus pachyphylla*	Thick-leaved Mallee; Red Bud Mallee					
Myrtaceae	*Eucalyptus victrix*	Smooth-barked Cooolibah					
Myrtaceae	*Melaleuca glomerata*	Desert Paperbark					
Myrtaceae	*Melaleuca interioris*						
Myrtaceae	*Melaleuca lasiandra*						
Myrtaceae	*Melaleuca uncinata*	Broom Bush					
Myrtaceae	*Micromyrtus flaviflora*						
Phrymaceae	*Glossostigma diandrum*	Spoon-leaf Mud-mat					
Phrymaceae	*Mimulus gracilis*	Slender Monkey-flower					
Phyllanthaceae	*Phyllanthus erwinii*						
Phyllanthaceae	*Sauropus arenosus*		✓			WA P3	
Plantaginaceae	*Stemodia florulenta*		✓				
Plantaginaceae	*Stemodia* sp. Tanami (P.K. Latz 8218)		✓				
Poaceae	*Amphipogon caricinus*	Long Greybeard Grass	✓				
Poaceae	*Amphipogon sericeus*		✓				
Poaceae	*Aristida holathera* var. *holathera*						
Poaceae	*Aristida inaequiglumis*	Feathertop Threeawn					
Poaceae	*Austrostipa nitida*	Balcarra Grass					
Poaceae	*Brachyachne prostrata*		✓				
Poaceae	*Cenchrus biflorus*	Gallon's	✓				✓

		Curse					
Poaceae	*Cenchrus ciliaris*	Buffel Grass					✓
Poaceae	*Cenchrus echinatus*	Burrgrass; Mossman River Grass					✓
Poaceae	*Dactyloctenium aegyptium*	Coast Button Grass					✓
Poaceae	*Enneapogon polyphyllus*	Leafy Nineawn					
Poaceae	*Eragrostis desertorum*	Desert Lovegrass					
Poaceae	*Eragrostis dielsii*	Mallee Lovegrass					
Poaceae	*Eragrostis elongata*	Close-headed Lovegrass					
Poaceae	*Eragrostis eriopoda*	Woollybutt Grass					
Poaceae	*Eragrostis eriopoda* subsp. Sandy fireweed (P.K. Latz 12908)		✓				
Poaceae	*Eragrostis falcata*	Sickle Lovegrass					
Poaceae	*Eragrostis laniflora*	Hairy-flowered Woollybutt	✓				
Poaceae	*Eragrostis olida*						
Poaceae	*Eragrostis setifolia*	Neverfail Grass; Bristly Lovegrass	✓				
Poaceae	*Eragrostis* sp. Limestone (P.K. Latz 5921)		✓				
Poaceae	*Eragrostis speciosa*	Handsome Lovegrass	✓				
Poaceae	*Eriachne aristidea*		✓				
Poaceae	*Eriachne benthamii*	Swamp Wanderrie					
Poaceae	*Eriachne lanata*		✓				
Poaceae	*Eriachne mucronata*	Mountain Wanderrie Grass	✓				

Poaceae	*Iseilema dolichotrichum*						
Poaceae	*Leptochloa fusca* subsp. *fusca*	Brown Beetle-grass					
Poaceae	*Paractaenum refractum*		✓				
Poaceae	*Paraneurachne muelleri*	Northern Mulga Grass	✓				
Poaceae	*Paspalidium basicladum*		✓				
Poaceae	*Paspalidium clementii*	Clement's Paspalidium					
Poaceae	*Paspalidium reflexum*		✓				
Poaceae	*Sporobolus actinocladus*	Ray Grass	✓				
Poaceae	*Triodia basedowii*	Lobed Spinifex; Buck Spinifex					
Poaceae	*Triodia epactia*						
Poaceae	*Triodia latzii*		✓				
Poaceae	*Triodia pungens*	Soft Spinifex	✓				
Poaceae	*Triodia salina*		✓				
Poaceae	*Triodia schinzii*						
Poaceae	*Triodia spicata*	Spike Flowered Spinifex	✓				
Poaceae	*Triodia* sp. [aff. *angusta/longiceps*] (DEA 14502)		✓	✓			
Poaceae	*Triraphis mollis*	Feather Top					
Polygalaceae	*Comesperma ciliatum*						
Polygalaceae	*Polygala isingii*						
Polygonaceae	*Duma florulenta*						
Portulacaceae	*Calandrinia balonensis*	Broadleaf Parakeelya	✓				
Portulacaceae	*Calandrinia pleiopetala*						
Portulacaceae	*Calandrinia polyandra*	Parakeelya					

Portulacaceae	*Calandrinia pumila*						
Portulacaceae	*Calandrinia reticulata*		✓				
Portulacaceae	*Calandrinia* ? *reticulata*		✓				
Proteaceae	*Grevillea eriostachya*	Flame Grevillea					
Proteaceae	*Grevillea stenobotrya*						
Proteaceae	*Grevillea wickhamii* subsp. *aprica*	Wickham's Grevillea					
Proteaceae	*Hakea chordophylla*		✓				
Proteaceae	*Hakea divaricata*	Needlewood					
Proteaceae	*Hakea leucoptera* subsp. *sericipes*	Needlewood	✓				
Proteaceae	*Hakea lorea* subsp. *lorea*	Witinti					
Rubiaceae	*Oldenlandia pterospora*		✓				
Rubiaceae	*Psydrax latifolia*		✓				
Rubiaceae	*Synaptantha tillaeacea*	Native Madder					
Rubiaceae	*Synaptantha tillaeacea* var. *hispidula*	Native Madder					
Santalaceae	*Anthobolus leptomerioides*						
Santalaceae	*Exocarpos sparteus*	Broom Ballart	✓				
Santalaceae	*Santalum lanceolatum*	Northern Sandalwood	✓				
Sapindaceae	*Dodonaea coriacea*		✓				
Sapindaceae	*Dodonaea viscosa* subsp. *angustissima*	Sticky Hopbush	✓				
Sapindaceae	*Dodonaea viscosa* subsp. *mucronata*	Sticky Hopbush	✓				
Scrophulariaceae	*Eremophila duttonii*						
Scrophulariaceae	*Eremophila forrestii* subsp.	Wilcox Bush					

	forrestii						
Scrophulariaceae	*Eremophila glabra* subsp. *glabra*	Tar Bush	✓				
Scrophulariaceae	*Eremophila latrobei* subsp. *latrobei*	Warty Fuschia Bush	✓				
Scrophulariaceae	*Eremophila maculata* subsp. *maculata*	Native Fuschia	✓				
Scrophulariaceae	*Eremophila pallida*		✓			WA P2	
Scrophulariaceae	*Eremophila platythamnos* subsp. *exotrachys*		✓				
Scrophulariaceae	*Eremophila tietkensii*						
Scrophulariaceae	*Eremophila willsii* subsp. *integrifolia*		✓				
Scrophulariaceae	*Glossostigma diandrum*						
Scrophulariaceae	*Peplidium aithocheilum*						
Scrophulariaceae	*Peplidium muelleri*						
Scrophulariaceae	*Peplidium* sp. Tanami (P.K. Latz 11904)		✓				
Solanaceae	*Duboisia hopwoodii*	Pituri					
Solanaceae	*Nicotiana benthamiana*	Tjuntiwari; Native Tobacco					
Solanaceae	*Nicotiana occidentalis*	Native Tobacco					
Solanaceae	*Nicotiana occidentalis* subsp. *obliqua*	Native Tobacco					
Solanaceae	*Solanum centrale*	Desert Raisin	✓				
Solanaceae	*Solanum chippendalei*						
Solanaceae	*Solanum cleistogamum*	Hillside Flannel Bush	✓				
Solanaceae	*Solanum gilesii*						
Solanaceae	*Solanum*	Thargominda					

	sturtianum	Nightshade					
Stylidiaceae	*Levenhookia chippendalei*	Chippendale's Stylewort					
Stylidiaceae	*Stylidium desertorum*						
Stylidiaceae	*Stylidium inaequipetalum*		✓				
Surianaceae	*Stylobasium spathulatum*	Pebble Bush					
Violaceae	*Hybanthus aurantiacus*		✓				
Zygophyllaceae	*Tribulopsis angustifolia*						
Zygophyllaceae	*Zygophyllum compressum*	Rabbit-ears Twinleaf					
Zygophyllaceae	*Zygophyllum tesquorum*						

Appendix 1, Table 2. Taxa removed from AVH-download for Kiwirrkurra IPA. Non-current names in AVH and Paltridge (2010) updated and included in Appendix 1, Table 1.

Family	**Taxon name**	**Reason for exclusion**
Acanthaceae	*Dipteracanthus australasicus* subsp. *australasicus*	Probable misID; collection is well-outside range of all known *Dipteracanthus* species. May be an introduction, or a new taxon(?).
Asteraceae	*Hyalosperma cotula*	MisID; *H. cotula* is a SW WA taxon.
Chenopodiaceae	*Tecticornia australasica*	MisID; taxon not recognised in WA and restricted to NT and Qld coasts.
Fabaceae	*Acacia trachycarpa*	Probable misID; appears to be a Pilbara taxon.
Goodeniaceae	*Verreauxia reinwardtii*	MisID; the genus *Verreauxia* is endemic to SW WA; possibly a *Goodenia*.
Lamiaceae	*Pityrodia lepidota*	MisID; *P. lepidota* occurs from the wheatbelt to the goldfields in SW WA.
Loranthaceae	*Amyema pendula* subsp. *pendula*	Doesn't occur in WA; probably a misID of superficially similar *A. miquelii*. Geocode error; locality statement for specimen is *c.* 400 km S of Kiwirrkurra (near Warburton).
Malvaceae	*Commersonia* cf. *rotundifolia*	MisID; no *Commersonia* species outside SW WA.
Myrtaceae	*Aluta maisonneuvei* subsp. *auriculata*	Probable misID of subsp. *maisonneuvei* based on locality.
Scrophulariaceae	*Eremophila platycalyx*	ID suspect; would represent an extreme E disjunction if

		correct.
Solanaceae	*Solanum ellipticum*	Probable misID; *S. ellipticum* is an excluded name in WA.
Solanaceae	*Solanum phlomoides*	Probable misID; *S. phlomoides* is a Pilbara taxon.

Appendix 2. Financial Statement

I hereby certify that all funds for this project have been spent in the manner and for the purposes specified by the contract.

Name: Ryonen Butcher

Signed: 

Date: 17 June 2016