Wuulupu – Low-lying Alluvial Plains

This land type is a subset of ***manangkarra*** and occurs on lower lying areas scattered across the IPA. It is most extensive in the south associated with the Lander River system. The more fertile soils hold moisture longer than the surrounding sandplains and hence support a greater abundance and diversity of plant species compared to other land types. These meandering depressions often correspond with traditional travelling routes and song-lines linking ancestral water places. ***Mulju*** (soakages) are usually situated in ***wuulupu***, due to groundwater lying relatively close to the surface in these areas.

Typical vegetation
Vegetation is typically open, low woodlands of *wapilingki* (smooth-barked coolabah – *Eucalyptus victrix*), occasionally with scattered *ngapiri* (river red gum – *E. camaldulensis*) trees and various bloodwoods (*Corymbia species*) over tussock grasses (including silky browntop – *Eulalia aurea* and golden beard grass – *Chrysopogon fallax*) and various sedges (mainly *Cyperus species*)
Important *Mangarri* (bush foods)
As for *manangkarra* land type
Important *Kuyu* (animals)
As for *manangkarra* land type, plus various frogs

Jilja – Sandhills

Jilja are a common feature in the northern Tanami region but only form parallel-trending red sand dunefields in the southern and eastern portions of the IPA, with these dunes rarely reaching more than 5 m in height. Scattered low sandhills occur through ***manangkarra*** areas in the western half of the IPA. As is the case elsewhere in Central Australia, ***jilja*** are composed of fine wind-blown sands which have low fertility and, as a consequence, support sparse shrubby vegetative cover.

Typical vegetation
Kalajirdi (soft spinifex – *Triodia pungens*) sparse hummock grasses predominate, overlain by occasional bloodwood trees (*Corymbia species*), shrubby wattles (*Acacia* species) or mixed low shrubs or perennial forbs
Important *Mangarri* (bush foods)
Yarla (bush potato – *Ipomoea costata*), *kampurarrpa* (desert raisin – *Solanum centrale*), *yarunpa* (inferior native tobacco – *Nicotiana velutina*) and, in fire-protected areas, *marrawaji* (desert walnut – *Owenia reticulata*)
Important *Kuyu* (animals)
Rdajalpa (woma python – *Aspidites ramsayi*), canegrass dragon (*Diporiphora winneckei*), *wardapi* (sand goanna – *Varanus gouldii*) and *milyirtiri* (night skink – *Liopholis striata*)

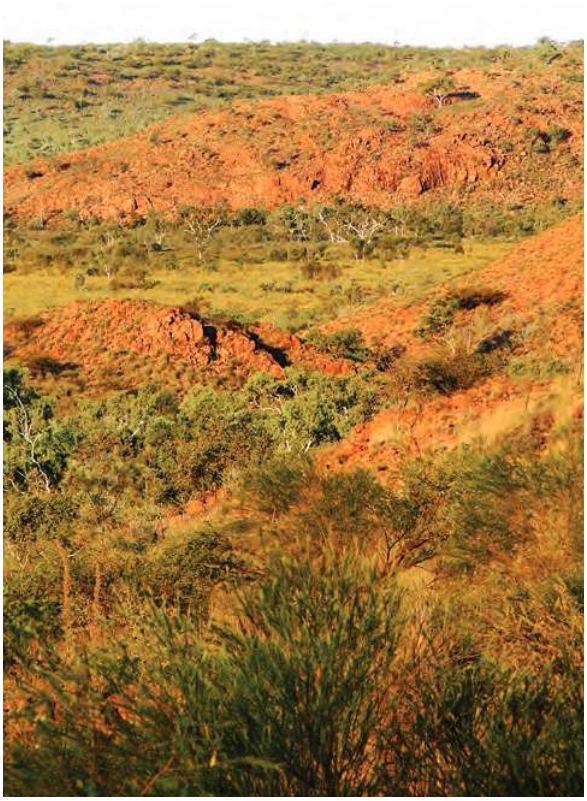
Jilja land type

Pamarrpa and Pirli – Rocky, Hill Country

Pamarrpa and *pirli* are associated with the Ware and Coomarie Ranges, the Winnecke Hills and various lesser hills, outcrops, small escarpments and low rises. They are most common in the western and north-western portions of the IPA. The highest relief in the IPA occurs within the Ware Range (rising to 521 m), with the baseline height of the surrounding sandplains averaging around 230 m. *Pamarrpa* and *pirli* in the IPA may comprise a variety of rock types, including sandstone, laterite, granite and conglomerate.

Pamarrpa country tends to impede the progress of fire fronts, thereby providing refugia in gullies, gorges and south-facing escarpments where fire-sensitive species or communities can persist. Water places such as springs, rockholes and run-off areas are also associated with elevated *pamarrpa* and *pirli* country. Rocky habitats were highly significant to traditional economies for the variety and specificity of the plants and animals they harbour. These areas are often of ongoing cultural importance for *Yapa* because of their links to ancestral beings associated with *Jukurrpa*.

Typical vegetation
Marna (spinifex – *Triodia species*) hummock grasses dominate with an overstorey of sparse, low *nurlku* (snappy gum – *Eucalyptus brevifolia*)
Important *Mangarri* (bush foods)
Wijirrki (rock fig – *Ficus brachypoda*), *karrinyarra* (silkyheads – *Cymbopogon obtectus*), *jurnpurnpa* (wild tobacco – *Nicotiana benthamiana*), *marrkirdi* (plumbush – *Santalum lanceolatum*), *yarrarntinyi* (native currant – *Psydrax latifolia*) and *yarraji* (edible grass seeds)
Important *Kuyu* (animals)
Kanyarla (euro – *Macropus robustus*), *yinarlingi* (echidna – *Tachyglossus aculeatus*), *jurlarda* (native honey bee – *Tetragonula* or *Austroplebeia* species)



Pamarrpa land type

Jurntu – Low Calcrete Rises

Low, weathered, rubbly calcrete rises are generally confined to areas bordering swamps or low-lying alluvial plains scattered across the IPA. Percolating carbonate-rich groundwater formed these deposits long ago, and their exposed and crumbling surfaces support a distinctive flora and are favoured by some game species, including echidna, blackhead python and, more recently, the European rabbit.

Typical vegetation
Open *marna* hummock grasslands (*Triodia pungens*), with scattered bloodwood (*Corymbia species*) and *wanurkurdu* (whitewood – *Atalaya hemiglauca*) low trees and mixed shrubs
Important *Mangarri* (bush foods)
Wild melon (*Cucumis* species), *marnakiji* (conkerberry – *Carissa lanceolata*)
Important *Kuyu* (animals)
Yinarlingi (echidna – *Tachyglossus aculeatus*), *mujunyku* (rabbit – *Oryctolagus cuniculus*) and, in the north, *wampana* (spectacled hare-wallaby – *Lagorchestes conspicillatus*)

Karru – Watercourses

A number of significant *karru* traverse the IPA. Foremost of these are Winnecke, Wilson and Hooker creeks. In the south, the terminal reaches of the Lander River form the only substantial watercourse. Most *karru* emanate from hills and plateaus in the elevated west and north-west sectors of the IPA. Though generally considered ephemeral, semipermanent waterholes are not uncommon along their courses.

Karru provide crucial habitat for waterbirds and many game species, including emu and nailtail wallaby, during prolonged periods of drought, and as such were important hunting areas for *Yapa*.

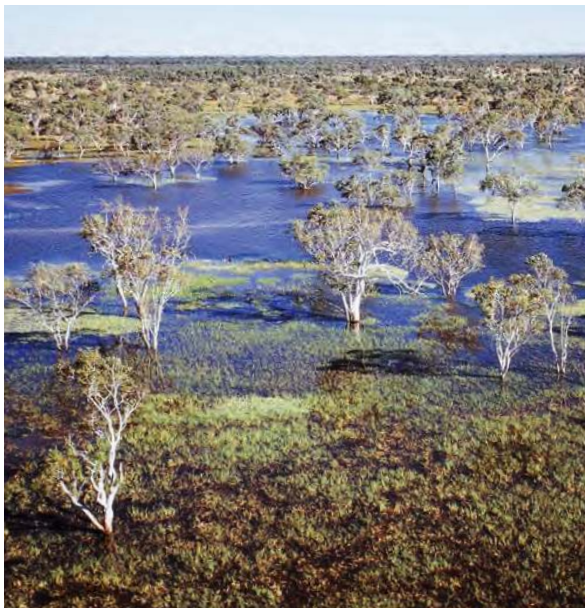
Typical vegetation
Ngapiri (river red gum – *Eucalyptus camaldulensis*), *wapilingki* (smooth-barked *coolabah* – *E. victrix*) and various bloodwood (*Corymbia species*) fringing woodlands are the dominant vegetation. In some areas *pakarli* (inland tea tree – *Melaleuca glomerata* or *M. lasiandra*) and scattered *yinirnti* (bean tree – *Erythrina vespertilio*) also occur. Understorey species include a mix of non-spinifex grasses and mixed low shrubs
Important *Mangarri* (bush foods)
Janmarda (bush onion – *Cyperus bulbosus*), *marrkirdi* (plumbush – *Santalum lanceolatum*), *ngarlajiyi* (pencil yam – *Vigna lanceolata*), *marnakiji* (conkerberry – *Carissa lanceolata*)
Important *Kuyu* (animals)
kururrungku (northern nailtail wallaby – *Onychogalea unguifera*), *yankirri* (emu – *Dromaius novaehollandiae*), *ngarlu* (sugarbag, produced by native bees – *Tetragonula* or *Austroplebeia species*), *jipilyaku* (ducks), *ngartarta* (*Austrothelphusa transversa* – freshwater crab), *yipilanji* (redgum witchetty grub – *Endoxyla* species), *yapuralyi* (sugar-leaf/lerp – *Glycaspis brimblecombei*)

Karru land type

Mangkuru – Swamps. Ephemeral Lakes and Floodouts

Seasonally inundated *mangkuru* are a feature of the IPA, with the most significant of these being Jiwaranpa (Lake Talbot and Kamira Lake), Nyukulku (Wilson Creek Floodout), and Mirirrinyungu (Duck Ponds). The availability of water and the relatively fertile soils surrounding these features contribute to higher species richness but also mean these sites are hotspots for feral animals and weed infestations. This land type is particularly favoured by *Yapa* for hunting and resource gathering.

Typical vegetation
Open woodlands of *wapilingki* (black box – *Eucalyptus microtheca* or smooth-barked coolabah – *E. victrix*) over soft grasses and sedges dominate this land type. Various bloodwoods (*Corymbia species*) and hakeas (*H. arborescens* and *H. macrocarpa*) are also relatively common in the shrub layer
Important *Mangarri* (bush foods)
Janmarda (bush onion – *Cyperus bulbosus*), *yakirra* (desert Flinders grass – *Yakirra australiensis*), *marrkirdi* (plumbush – *Santalum lanceolatum*)
Important *Kuyu* (animals)
yankirri (emu – *Dromaius novaehollandiae*), *ngarlu* (sugarbag produced by native bees – *Tetragonula* or *Austroplebeia* species), *jipilyaku* (ducks), *ngartarta* (*Austrothelphusa transversa* – freshwater crab), *jipilyaku* (ducks)



Mangkuru land type

Muluwurru – Salt Lakes

True, hyper-saline saltpans are uncommon in the semi-arid landscape of the northern Tanami, but pans of varying salinity occur throughout the IPA. These range from small playa to large ephemeral lakes such as Nguringku (Lake Buck) and Wardalya (Spider Lake). These closed drainage systems fill from a combination of surface flow (run-on) and groundwater recharge; following peak rainfall events, they may hold water for several months. Episodic wetlands of this kind provide important inland habitat for waterbirds and migratory species. The sandplains surrounding ***muluwurru*** are often key habitat for species such as bilby, mulgara and macropods. ***Muluwurru*** are important areas for ***Yapa*** for hunting and bush food collection.

Typical vegetation
Bare pans are fringed by low *mungilypa* (samphire shrubland – *Tecticornia indica*, *T. pergranulata*, *T. verrucosa*) and in some cases are surrounded by salt mulga (*Acacia maconochieana*) or other saline-tolerant shrubs such as *pakarli* (inland tea tree – *Melaleuca glomerata*)
Important *Mangarri* (bush foods)
Janmarda (bush onion – Cyperus bulbosus) and *manyani* (pink plains bush – *Pluchea tetranthera*) for its edible grubs
Important *Kuyu* (animals)
Waterbirds (in season), *kalawurru* (floodplain monitor – *Varanus panoptes*), *marlu* (red kangaroo – *Macropus rufus*) and *mirnirri* (thorny devil – *Moloch horridus*)

Muluwurru land type near Duck Ponds with *pakarli* vegetation

Pilpilli – Paleodrainage Systems

Broad areas of low relief occur in the south of the IPA where subsurface ancient river channels exist. These subtle surface depressions lack defined drainage and may periodically flood, but in most cases their soils allow floodwaters to percolate down and recharge aquifers. *Pilpilli* are characterised by large, distinctively shaped termite mounds that occur almost exclusively in this land type. The range of game species and bush foods typical of this specialised land type mean that *pilpilli* were traditionally important hunting and resource areas for *Yapa*. *Pilpilli* are also ecologically significant as key habitat for a range of threatened fauna including *jajina* (mulgara), *walpajirri* (bilby) and, in the South Tanami IPA, *warrana* (great desert skink).

Typical vegetation
Pakarli (inland tea tree – *Melaleuca glomerata*) open shrubland or chenopod low open shrubland interspersed with *marna* (spinifex – *Triodia species*) hummock grasslands
Important *Mangarri* (bush foods)
Janmarda (bush onion – *Cyperus bulbosus*), *jukurru* (northern orange – *Capparis umbonata*), *yakirra* (desert Flinders grass – *Yakirra australiensis*)
Important *Kuyu* (animals)
Wardilyka (bush turkey – *Ardeotis australis*), *walpajirri* (bilby – *Macrotis lagotis*), *yuturnrpa* (termites), *milwarna* (Stimson's python – *Antaresia stimsoni*)

Kardiya have divided the region included in the IPA into three bioregions (Figure 9). These relatively large areas, with landscape-scale similarities in natural features and environmental processes affecting the function of entire ecosystems, are:

- Tanami Desert Bioregion (> 98% of the IPA): This bioregion is characterised by gently undulating sandplains with areas of sand dunes rarely exceeding 5 m in height, interspersed with hills, ranges, wetlands and drainage systems. Sandplain vegetation is dominated by hummock grasslands associated with acacia, bloodwood, grevillea and hakea mixed shrub steppes. All but the northern portion of the IPA is contained within this bioregion.
- Sturt Plateau Bioregion (< 2% of the IPA): Gently undulating plains on lateritised Cretaceous sandstones and neutral sandy red and yellow earths characterise this bioregion. The vegetation is predominantly small-fruited bloodwood (*Corymbia dichromophloia*) woodland with spinifex understorey. A very small part of this bioregion is represented in the north-west corner of the IPA.
- Ord Victoria Plains Bioregion (< 0.5% of the IPA): The characteristic features of this bioregion are level to gently undulating plains with scattered hills or rocky rises on Cambrian volcanics and Proterozoic sedimentary rocks. Typical vegetation is mixed grassland (spinifex and annual grasses) with scattered bloodwood and snappy gum low trees. A very small portion of this bioregion intrudes into the north-east corner of the IPA.

Kardiya have also identified the following two Sites of Conservation Significance (SOCS) that are partially contained in the IPA (Figure 9):

- South-west Tanami SOCS: Of international significance, this SOCS covers 19,433 km^2 of country, most of which is located in the adjoining Southern Tanami IPA. Only a very small area extends into the south-west corner of the Northern Tanami IPA. Of the 11 threatened species documented in the entire SOCS, six vertebrate species have been recorded in the Northern Tanami IPA. Two plant species endemic to the Tanami bioregion and occurring in this SOCS have been recorded in the Northern Tanami IPA (refer also Sections 6.4.1 and 6.5.1).
- Lake Surprise and Lander River Floodout Swamps SOCS: Of national significance the majority of this 3681 km^2 SOCS occurs in the Southern Tanami IPA, with only the northern portion extending into the south-east corner of the Northern Tanami IPA. It contains six threatened species (five vertebrates and one plant: *Eleocharis papillosa*, but the latter has not been recorded in the Northern Tanami IPA). Six of the significant plant species (either at the bioregion or Northern Territory level) documented for this SOCS have also been recorded in the Northern Tanami IPA portion, as has the one endemic frog species (refer also Sections 6.4.1 and 6.5.1).