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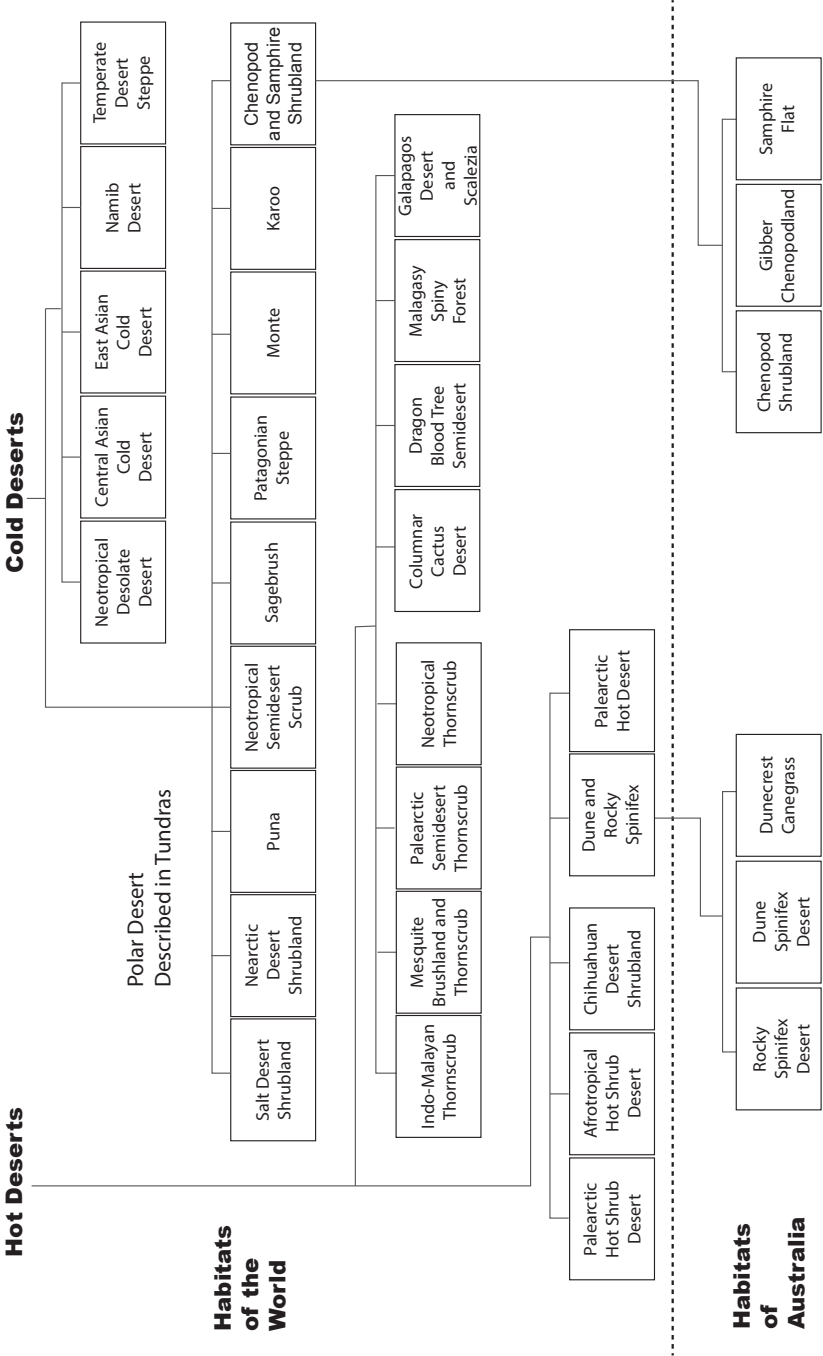
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Australian Deserts Dendrogram (Biome 2)

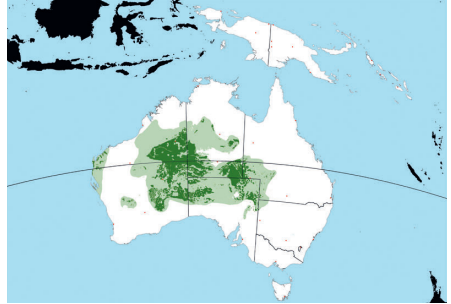
Deserts



DESERTS



Au2A DUNE SPINIFEX DESERT

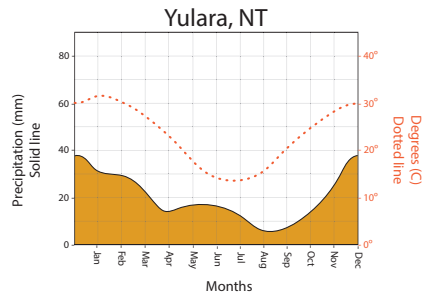


IN A NUTSHELL: A spiky, low grassland that can be nearly impenetrable, occurring on palaeo-sand dunes and sandy interdune swales in arid c. Australia. **Global**

Habitat Affinities: None; spinifex grasslands are unique to Australia. **Continental Habitat Affinities:** ROCKY SPINIFEX DESERT; DUNE CREST CANEGRASS. **Species Overlap:** ROCKY SPINIFEX DESERT; DUNE CREST CANEGRASS; TROPICAL TUSsock GRASSLAND; NORTHERN ACACIA SAVANNA. **Full Bird Assemblage:** habitatsoftheworld.org/Au2A.

DESCRIPTION: These hummock grasslands are dominated by the *Triodia* genus of grasses, known, rather confusingly, by the common name spinifex, shared with grasses of the genus *Spinifex*. In c. Australia, and especially the Great Sandy Desert, the landscape is dominated by huge seas of linear sand dunes that were very active during the drier glacial periods, but most have been stable for around 20,000 years. The stabilised longitudinal dunes can be over 100 mi. (160 km) long and 60 ft. (20 m) high, although they are often much lower than that. The dunes all align, and the different strikes (directions) within the dune fields can indicate the prevalent wind direction of the time just prior to dune stabilisation. The longitudinal dunes, distinct from the crescent-shaped (barchan) sand dunes of Africa and Asia, are a result of more uniform wind direction and reduced amounts of sand.

Thinner sheets of aeolian (wind-blown) sand can blanket the landscape as sand plains, but these do not have a marked obvious structure, displaying only limited relief over thousands of acres/hectares. Although such sand plains are widespread, they tend to be ignored in favour of the more dramatic dune landscape. Loess deposits, more common in the Northern Hemisphere, are slightly different: they are sheets of extremely fine aeolian silt, much finer than the sand, and are laid down from silt clouds, much like ash from a volcano. Loess deposits do occur to a limited extent in s. Australia but rarely form the substrate of Dune Spinifex Desert. In the longitudinal dunes, and on the vast swales between dunes covered in sandy colluvium (gravity-transported material) and alluvium (water-transported material), spinifex forms the main sand-binding habitat. Spinifex is also found in rocky terrains, and although the grass systems and indeed many of the spinifex





Dune Spinifex Desert is the dominant habitat in the vast plain surrounding Uluru (Ayers Rock) in Northern Territory. © IAIN CAMPBELL, TROPICAL BIRDING TOURS/UNSW E&ERC

species are similar, Dune Spinifex Desert and **ROCKY SPINIFEX DESERT** habitats have different animal communities.

The dunes are covered with widely spaced spinifex tussocks with a curious and unique growth form of large, low hummocks, usually not more than 3 ft. (1 m) high but up to 5 ft. (1.5 m) wide, with the centre of the plant dead, so the hummocks grow into rings. The roots are stiff, and the stems of many grasses of the spinifex habitats are infused with silica at the tips, which makes the plants very rigid. The dominant spinifex species on the dunes are Feathertop Spinifex (*Triodia schinzii*) and Hard Spinifex (*Triodia basedowii*). Very widely dispersed trees such as Sandhill Bloodwood (*Corymbia chippendalei*) eke out an existence in the extremely nutrient-deficient soils.

In the swales between dunes and where the dunes are much lower and older and have more soil development, Hard Spinifex and Feathertop Spinifex can occur, but the very pugnacious and widespread Soft Spinifex (*Triodia pungens*) becomes dominant. Soft Spinifex is also the dominant grass species in most of the spinifex-related habitats. Desert Sheoak (*Allocasuarina decaisneana*) is a very iconic and distinctive tree of c. Australia. Its often flat top and long drooping leaves give the impression of a cross between an Umbrella Thorn (*Vachellia tortilis*) of Africa and a Weeping Willow (*Salix babylonica*) of China. Very slow-growing trees, Desert Sheoaks rarely create more than 20% canopy cover, usually representing only around 5% canopy cover. They are the main tree over much of the sandy plains and feature in many photographs around Uluru (Ayers Rock). In



Scarlet-chested Parrot is a beautiful, though rare and seldom-seen, inhabitant of the southern portions of Dune Spinifex Desert habitat. © PETE MORRIS

some large interdune swales, very open, low stands of Mulga (*Acacia aneura*) and Kariku Sheoak (*Casuarina pauper*) can occur, usually under 15 ft. (4.5 m) high and often associated with Hard Spinifex. Where the Mulga becomes denser than 40% canopy cover, and in some places forms a closed canopy, the dynamics of the habitat change, allowing many more animal species to survive, and the habitat is classified as **SPINIFEX MULGA**. In a few areas, the Dune Spinifex Desert merges with **DUNE CREST CANEGRASS**, where the dunes are less stabilised and the dominant plant is Sandhill Cane grass (*Zygochloa paradoxa*) rather than spinifex (*Triodia*). At a distance the habitats seem very similar, but the Dune Spinifex Desert areas have more ground cover.

WILDLIFE: The grasses of spinifex habitats are spiny and nutrient-poor and therefore unattractive to grazing mammals such as the kangaroos so common through most of Australia. The few mammals that once lived in this habitat, such as the Greater Bilby or Rufous Hare-Wallaby, have been devastated, not only by a change in the fire regime of the region but also by the introduction of the food competitor European Rabbit and the predatory feral cat. Without large herbivores and their predators, the main herbivores are termites, and the food web builds from there. Although of limited use as a food source, spinifex cover forms a very important refuge for sheltering birds, lizards, and mammals.

The Dune Spinifex Desert has few birds, and very few are limited to it. Sandhill Grasswren is associated mainly with this habitat, and the rare Princess Parrot and Scarlet-chested Parrot, which both have very broad distributions through c. Australia, are largely centred around the Dune



Zebra Finch is a widespread and gregarious species that occurs in many inland habitats, including Dune Spinifex Desert. © IAIN CAMPBELL, TROPICAL BIRDING TOURS/UNSW E&ERC

Spinifex Desert, the former among Desert Sheoaks, and the latter among low eucalypts. With the trees so widely spaced, few of the small woodland birds such as thornbills or gerygones survive here, although ground-feeding species such as the Purple-backed Fairywren, Yellow-rumped Thornbill, and Southern Whiteface do occur. Zebra Finch is the only finch regularly found here, poised to take advantage when mass-seeding of spinifex occurs, when it is joined by Crested Pigeon, Diamond Dove, Mulga Parrot, and Budgerigar. Because the flowering tree and shrub cover is so limited, most of the blossom nomads (nectivorous birds that follow flower blooms) of surrounding habitats are missing. Singing, White-plumed, Grey-headed, and even the much rarer Pied Honeyeaters can be found occasionally in this habitat. The open plains and occasional tree for nesting provide a favourable environment for raptors such as Black-breasted Kite, Wedge-tailed Eagle, and Brown Falcon. Rainbow Bee-eater is the main perch-hawking insectivore, while White-backed Swallow hunts insects from the sky.

The populations of many lizards fluctuate greatly in a cyclical manner, and even species found in the same habitat vary in their microhabitat preferences, which are regulated by fire regimes and rain cycles. This means that species described in field guides as uncommon may be abundant in some years and rare in others. Some of the lizards you can hope to see here are the spectacular and bizarre-looking Thorny Devil (*Moloch horridus*); the large Sand Goanna (*Varanus gouldii*); Rusty Desert and Short-tailed Monitors (*Varanus eremius* and *Varanus brevicauda*); Long-nosed Dragon (*Gowidon longirostris*); Central Netted and Military Dragons (*Ctenophorus nuchalis* and *Ctenophorus isolepis*); Northern Spiny-tailed Gecko (*Strophurus ciliaris*); and Smooth Knob-tailed Gecko (*Nephurus laevis*). Snakes present in this habitat (all venomous to varying degrees) include Mulga Snake (*Pseudechis australis*), Western Brown Snake (*Pseudonaja mengdeni*), Ringed Brown Snake (*Pseudonaja modesta*), Northern Desert Banded Snake (*Simoselaps anomalus*), and Narrow-banded Shovel-nosed Snake (*Brachyuophis fasciolatus*). Many Australian snakes are deadly, and some are very difficult to distinguish from harmless species—as a safety measure, do not approach any snakes. Frogs are few and far between, but the enigmatic Desert Spadefoot Frog (*Notaden nicholli*) can be found here.

CONSERVATION: Dune Spinifex Desert is so inhospitable to agriculture that it has largely avoided widespread conversion to farming, though some areas are subjected to light grazing and



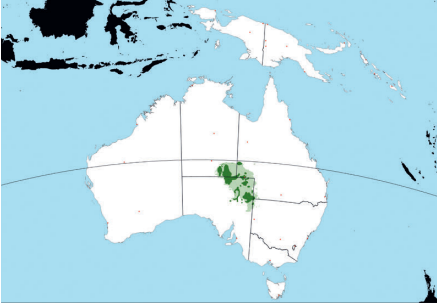
The colourful Rainbow Bee-eater, a widespread species in Australia, is most often seen hawking insects on the wing from a prominent perch. © BEN KNOOT

planting for improved pasture. The majority of the threats to this habitat are from introduced plants, introduced herbivores such as Dromedary Camel, and mammal predators such as feral cats. The reason so many of the small inland mammals have gone extinct is not fully understood, as it appears that some of them went extinct before cats had arrived in the centre of Australia.

DISTRIBUTION: Dune Spinifex Desert habitat is common from extreme sw. Queensland, all the way across the country to the tropical Western Australia coast. Any visitor to Australia's arid interior is likely to come across spinifex—e.g., on the Birdsville and Strzelecki Tracks (South Australia), around Alice Springs and Uluru (Northern Territory), and near Mt. Isa (Queensland).

WHERE TO SEE: Uluru, Northern Territory, Australia; Great Sandy Desert, Western Australia.

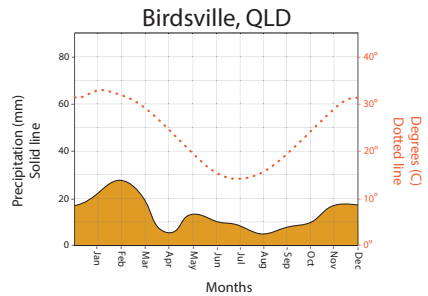
Au2B DUNECREST CANEGRASS



IN A NUTSHELL: Mainly barren longitudinal sand dunes with clumps of Sandhill Canegrass and a bit of spinifex.

Global Habitat Affinities: SAHARAN ERG DESERT; NAMIB SAND DESERT. **Continental Habitat Affinities:** DUNE SPINIFEX DESERT. **Species Overlap:** TROPICAL TUSsock GRASSLAND; DUNE SPINIFEX DESERT. **Full Bird Assemblage:** habitatsoftheworld.org/Au2B.

DESCRIPTION: This is the sparse, sandy habitat that forms on the crests of the younger longitudinal sand dunes of c. Australia. These longitudinal dunes tend to be higher than those dominated by spinifex, with Big Red, the easternmost of over 1000 sand dunes in the Simpson Desert, standing over 120 ft. (36.5 m) high. The dunes of the Simpson Desert are very young, some having been deposited as recently as 10,000–8000 years ago, and align along a strike (direction) parallel to the prevalent wind direction of the time, just prior to dune stabilisation. These longitudinal dunes are different from the crescent-shaped (barchan) sand dunes of Africa and Asia, where the dunes form perpendicular to the prevailing winds, are far more mobile and smaller, and usually have more sand with fewer swales between them. Dunecrest Canegrass habitat forms on aeolian sands in hot desert climates (Köppen **Bwh**) with 6.5 in. (170 mm) annual rainfall and summer temperatures reaching 120°F (50°C). Due to the desiccating climate and lack of organic material, the soils are usually devoid of any horizon development, being little more than unconsolidated original sand deposits. The red colour of some of the sands is caused by the very minor component of iron oxides, such as hematite, in the otherwise almost pure quartz of the sands.



Sandhill Canegrass (*Zygochloa paradoxa*) is a dense, green, bushy perennial grass that superficially resembles the spinifex grasses (*Triodia*; see **DUNE SPINIFEX DESERT**), in that it grows in hummocks 5 ft. (1.5 m) tall and 3 ft. (1 m) wide. It differs from spinifex in not being spiky and in having a horizontal rhizomatous stem sending out new shoots rather than the circular growth form of the spinifex rings. Sandhill Canegrass is the dominant grass on many of the dunes, although Erect Kerosene Grass (*Aristida holathera*) and Woollybutt Grass (*Eragrostis eriopoda*) often occur. Small hummocks of Hard Spinifex (*Triodia basedowii*) are almost always interspersed within the Sandhill Canegrass and may dominate along the lower edges of the sand dunes. Forbs are present, and after rains the dunes can be flush with green and yellow blossoms of Green Birdflower (*Crotalaria cunninghamii*) and Bluebush Pea (*Crotalaria eremaea*). Small widely spaced shrubs such as Sandhill Wattle (*Acacia ligulata*) and Sandhill Grevillea (*Grevillea stenobotrya*) are uncommon but contrast with the bare sand and, because they can grow to 6 ft. (2 m) tall in these sands, are obvious when present. Especially in dry years, the dunes can be devoid of any shrubby vegetation.



Simpson Desert is home to more than 1000 parallel dunes, the most famous of which is Big Red near the town of Birdsville in sw. Queensland, which stands 120 ft. (36.5 m) high. © SAM WOODS, TROPICAL BIRDING TOURS

Dunecrest Canegrass is not a fire-tolerant habitat, and fires in summer kill the canegrass and forbs resulting in the expansion of Hard Spinifex and Feathertop Spinifex (*Triodia schinzii*) at the expense of Sandhill Canegrass, so the habitat changes to Dune Spinifex Desert.

WILDLIFE: Because life on the top of a sand dune is so harsh, Dunecrest Canegrass is understandably characterised by its lack of wildlife, although Eyrean Grasswren is an endemic and obligate species here. This enigmatic small bird is both range-restricted and difficult to find,

Dunecrest Canegrass is a very localised habitat, occurring on the top of longitudinal dunes, deep within the Outback of c. Australia. © SAM WOODS, TROPICAL BIRDING TOURS



usually glimpsed running mouselike between clumps of Sandhill Canegrass, and unlike most other grasswrens, which will occasionally call from low branches of trees or shrubs, this species almost never leaves the ground or grass. Ground-feeding pigeons are surprisingly well represented, with Crested Pigeon and Diamond and Peaceful Doves regularly present, and even the rare Flock Bronzewing occasionally visiting the dunes after good rains. Purple-backed and White-winged Fairywrens are both present, in contrast with **DUNE SPINIFEX DESERT**, where White-winged Fairywren is much rarer. Both Crimson and Orange Chats are found here feeding on the ground, and the Cinnamon Quail-thrush, a medium-sized, skulking, ground-feeding species that is usually associated with chenopod-dominated habitats, can also be found in this habitat.

The threatened Crest-tailed Mulgara, a nocturnal, medium-sized marsupial that looks like a guinea pig with a stumpy, bushy tail, rests in burrows under Sandhill Canegrass hummocks. The vulnerable and range-restricted Dusky Hopping Mouse is a small nocturnal rodent that resembles a miniature South African Springhare; it is a communal animal, living in a series of connected burrows. One of the commonest reptiles found in this habitat is Central Bearded Dragon (*Pogona vitticeps*); some other species include Wedgesnout Ctenotus (*Ctenotus brooksi*), Canegrass Two-lined Dragon (*Diporiphora winneckeii*), Painted Dragon (*Ctenophorus pictus*), Central Netted Dragon (*Ctenophorus nuchalis*), Ribbon Ctenotus (*Ctenotus taeniatus*), and Eastern Tree Dteila (*Gehyra versicolor*).

CONSERVATION: Dunecrest Canegrass is nearly impossible to farm. The majority of the threats to this habitat are from introduced plants, introduced herbivores such as Dromedary Camel, and mammal predators such as feral cats. Many of the smaller mammals here are under extreme threat, but the reasons for the plummeting numbers are not clearly understood.

DISTRIBUTION: Please note that where Dunecrest Canegrass occurs, it is almost invariably surrounded by **DUNE SPINIFEX DESERT** lower on the dunes; this makes it so limited it is not mappable with the units used in the various state mapping systems—thus the dark green areas of probable distribution on the map for this account do not match with state systems. Dunecrest Canegrass is centred on the Simpson and Strzelecki Deserts in sw. Queensland, n. South Australia,

and s. Northern Territory.

In the west and north, it is replaced by Dune Spinifex Desert, and to the south, it merges with the **GIBBER CHENOPODLAND**.

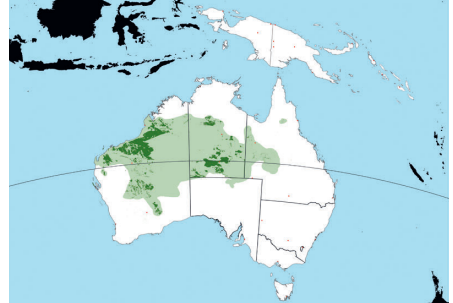
WHERE TO SEE: 'Big Red' sand dune near Birdsville, Queensland, Australia; Mungeranie, Birdsville Track, South Australia.

Eyrean Grasswren is an elusive habitat specialist of Dunecrest Canegrass. Its presence is sometimes revealed by the presence of its footprints within open sandy areas between clumps of grass. © SAM WOODS, TROPICAL

BIRDING TOURS



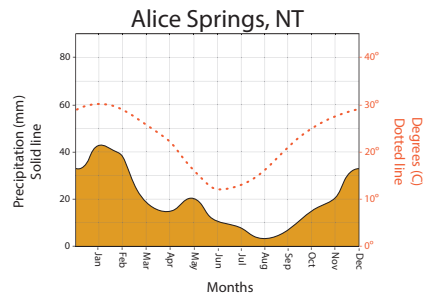
AU2C ROCKY SPINIFEX DESERT



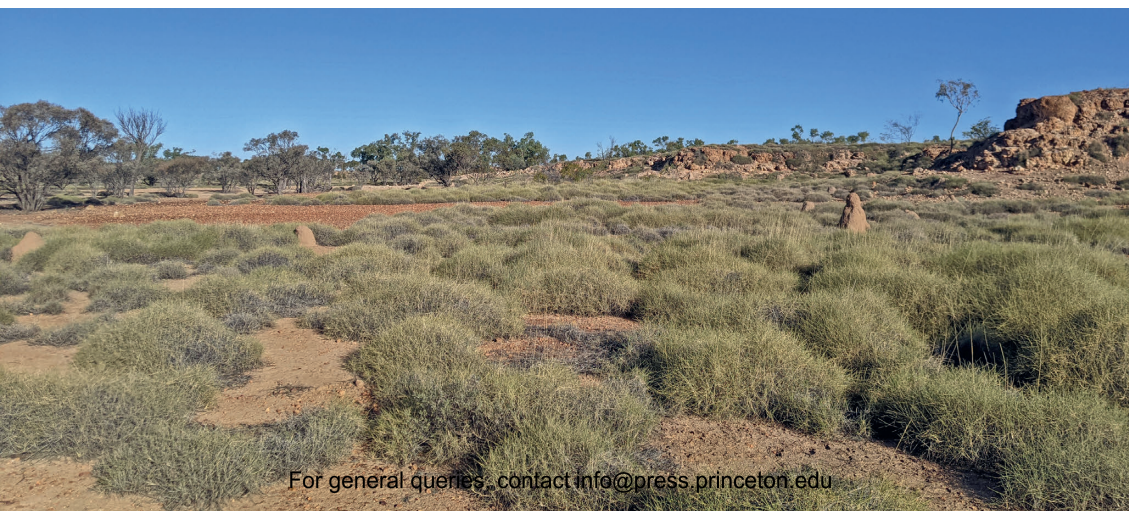
IN A NUTSHELL: A spiky, low grassland of very arid c. Australia that can be near impenetrable. **Global Habitat Affinities:** Unique; there are no grasslands like spinifex outside of Australia. **Continental Habitat Affinities:**

DUNE SPINIFEX DESERT. Species Overlap: **SPINIFEX EUCALYPT SAVANNA; TROPICAL TUSsock GRASSLAND; DUNE SPINIFEX DESERT. Full Bird Assemblage:** habitatsoftheworld.org/AU2C.

DESCRIPTION: The word 'spinifex' usually refers to a genus of grasses (*Spinifex*) found in coastal areas around the world, but in Australia 'spinifex' is the name of desert habitat that includes hummock grasses (also known as spinifex) of the genera *Triodia* and, to a lesser extent, *Plectrachne*. The spinifex landscape described here is the quintessential habitat of the arid inland and, in various forms, covers large tracts of desert Australia. In contrast with the tussock grasses of Australia and almost all other grasses in the world, spinifex plants are extremely spiky, and some plants have leaves infused with silica at the tips, making them very rigid and dagger-like. Where this habitat occurs in warm monsoonal and savanna



Rocky Spinifex Desert lines the hills of both lateritic outcrops and rocky swales in c. Australia. © IAIN CAMPBELL, TROPICAL BIRDING TOURS/UNSW E&ERC



climates (Köppen **Awa**, **Awb**) with long periods of plant stress, they are associated with extremely inert shallow soils over sandstone plateaus and escarpments. They are most common in desert climates (Köppen **Bwh**) with as little as 6 in. (150 mm) of annual rainfall. This usually precludes large trees from growing, so the few trees that do occur are limited to mallee-form (with most branches sprouting from the tree base) eucalypts such as Finke River Mallee (*Eucalyptus sessilis*), Blue-Leaved Mallee (*Eucalyptus gamophylla*), and Kingsmill's Mallee (*Eucalyptus kingsmillii*), and other desert eucalypts like Snappy Gum (*Eucalyptus leucophloia*). Pandan Wattle (*Acacia tumida*) is scattered through this habitat in the northwest of the country and can become concentrated into groves where the habitat is reclassified as **NORTHERN ACACIA SAVANNA**.

Rocky Spinifex Desert is found in rocky environments such as lateritic plateaus, where ancient iron-rich but nutrient-poor soils predominate, sandstone plateaus, breakaways (the edges of minor escarpments), and rocky ridgelines. The soils on the colluvial slopes (the edges of the steep rocky ridges) and sandstone plateaus are lithosols that are very sandy, very nutrient-deficient, and without much profile development. In these erosional and depositional environments, there is the near-ubiquitous Soft Spinifex (*Triodia pungens*), but the slopes are usually dominated by Giant Grey Spinifex (*Triodia longiceps*), Weeping Spinifex (*Triodia brizoides*), and Porcupine Grass (*Triodia molesta*)—the common and scientific names of which tell you all you need to know about wandering in this habitat! In the northwest of the country, Soft Spinifex and Limestone Spinifex (*Triodia wiseana*) reign supreme, with only minor incursions of Weeping Spinifex and Porcupine Grass. Rocky Spinifex Desert also forms on tops of lateritic plateaus that resemble the mesas of the sw. United States, where the residual soils are either iron-infused caps (ferricretes or laterites)

Rufous-crowned Emuware is usually very shy, but when calling it comes to the top of spinifex hummocks. © PETE MORRIS



or silica-infused caps (silcrete), and although they have soil profiles that may have developed over millions of years, they also are extremely nutrient deficient.

The grass systems are similar in **DUNE SPINIFEX DESERT** and Rocky Spinifex Desert, but the two have very different suites of animals, so are treated as different habitats. The grasses are usually widely spaced and have a curious and unique growth form: large, low hummocks that are usually not very high but may be up to 5 ft. (1.5 m) wide, with each stem growing from the same node as the root, so that the stems have independent sources for nutrients. In this habitat, one of the harshest of environments in Australia, competition from other grasses or shrubs is limited, but the competitive strategy for the spinifex is to have mass seedings during good seasons but for the seeds to have delayed sprouting. In periods of fire, which usually occur about once a decade, some of the original spinifex grasses may be burnt back to the base and resprout, and the seeds may sprout with the next rain. As the individual plants age, undergo fires, and resprout after fires, the perimeter ring of the hummock continues to grow, so that rings often extend to 15 ft. (5 m) wide, and plants live for decades. After good rains, and if there has not been a fire for some decades, the spinifex grasses risk getting smothered by other grasses such as Red Spathe Grass (*Schizachyrium fragile*), various *Aristida* grasses, forbs such as Fragrant Streptoglossa (*Streptoglossa odora*), and a variety of shrubs such as Silver Senna (*Senna artemisioides*), *Eremophila*, and *Maireana* chenopod shrubs.

WILDLIFE: The spiny and nutrient-poor grasses of spinifex habitats are unattractive to grazing mammals such as the kangaroos so common through most of Australia. Without large herbivores and their predators, the main herbivores are termites, and the food web builds from there. Although of limited use as a food source, spinifex cover forms a very important refuge for

Chestnut-quilled Rock-Pigeon is a cryptic desert species best looked for during the cooler periods at each end of the day, when it is most active. © NICK ATHANAS, TROPICAL BIRDING TOURS





Spinifex Pigeon is the quintessential bird of spinifex habitats in n. Australia.

© IAIN CAMPBELL, TROPICAL BIRDING TOURS/UNSW E&ERC

sheltering birds, lizards, and small mammals.

Birds typical of Rocky Spinifex Desert areas include most of the grasswrens, such as Pilbara Grasswren, Black Grasswren, and Opalton Grasswren. Other birds using the spinifex for cover include Rufous-crowned Emuwren, Spinifexbird, Painted Firetail, Spinifex Pigeon, and the very rare (once thought extinct) Night Parrot. Chestnut-quilled and White-quilled Rock-Pigeons are both obligates to this habitat, living on the spinifex-covered sandstone escarpments of Arnhem Land (Northern Territory) and the Kimberley (Western Australia), respectively. Overhead, this is the favourite habitat of the rarest of all Australian raptors, Grey Falcon.

Rock-wallabies are the typical mammals of this habitat, with various species depending on location. Although macropods (members of the kangaroo family), they are adapted to this landscape with the seeming agility of mountain goats. Yellow-footed Rock-Wallaby from the Flinders Range North of Adelaide, for example, cohabits the rocky terrain with more widespread kangaroos such as Common Wallaroo and Red Kangaroo. Small marsupial mice such as Fat-tailed False Antechinus occur, and the ubiquitous neo-native (introduced only 8000 years ago) Dingo is a very regular visitor to this environment.

The populations of many lizards fluctuate greatly in a cyclical manner, and even species found in the same habitat vary in their microhabitat preferences, which are regulated by fire regimes and rain

cycles. This means that species described in field guides as uncommon may be abundant in some years, and vice versa. Some of the lizards you can hope to see are Long-nosed Dragon (*Gowidon longirostris*), Slater's Ring-tailed Dragon (*Ctenophorus slateri*), Central Bearded Dragon (*Pogona vitticeps*), Centralian Rough Knob-tailed Gecko (*Nephurus amylae*), Black-headed Monitor (*Varanus tristis*), Perentie (*Varanus giganteus*), and Central Clawless Gecko (*Crenadactylus horni*). Snakes are less obvious than lizards, but typical snakes include Centralian Carpet Python (*Morelia bredli*), Curl Snake (*Suta suta*), Mulga Snake (*Pseudechis australis*), and Central Whipsnake (*Demansia cyanochasma*). The latter three are venomous, but all snakes in Australia should be avoided.

CONSERVATION: This is a very widespread habitat throughout c. Australia, the majority of it well away from intense human activity, and most of it protected on Aboriginal lands. This is the habitat over most of the uranium deposits of the Northern Territory, so there is mining pressure on accessible parts of w. Arnhem Land.

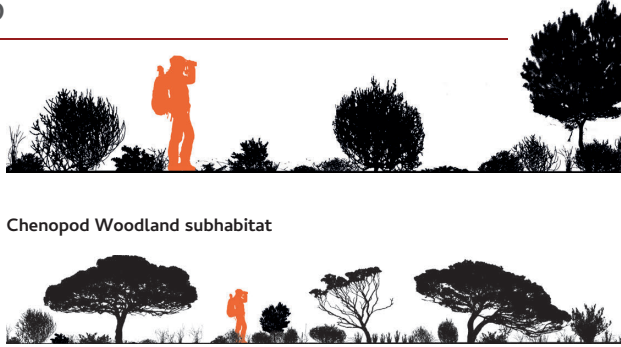
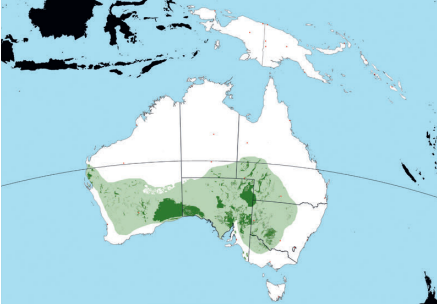
DISTRIBUTION: Rocky Spinifex Desert is common from extreme sw. Queensland all the way across the country to the tropical Western Australia coast. It is prevalent in the sandstone escarpments of Arnhem Land (Northern Territory) and the Kimberley (Western Australia) and is very widespread in the Pilbara region (Western Australia).

WHERE TO SEE: MacDonnell Ranges, Northern Territory, Australia; Lark Quarry near Winton, Queensland, Australia; Marble Bar, Western Australia; Mt. Isa, Queensland, Australia.

Yellow-footed Rock-Wallaby is a striking but scarce and local dweller of rock outcroppings in this habitat, generally shying away from populated areas. © BEN KNOOT



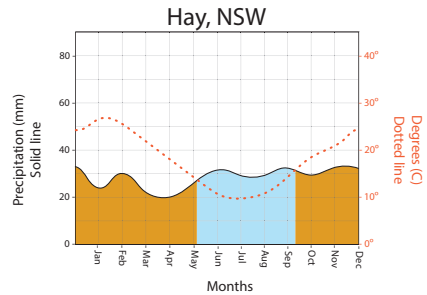
Au2D CHENOPOD SHRUBLAND



IN A NUTSHELL: Very low, sparse shrubland tolerant of salt and aridity that can have occasional low trees in some areas. **Global Habitat Affinities:** **SUCCULENT KAROO**; **SUCCULENT PUNA**; **NORTH AMERICAN SAGEBRUSH SHRUBLAND**. **Continental Habitat Affinities:** **GIBBER CHENOPODLAND**. **Species Overlap:** **GIBBER CHENOPODLAND**; **GRASSY MULGA**. **Full Bird Assemblage:** habitatsoftheworld.org/Au2D.

DESCRIPTION: The first impression an international visitor may have of the Hay Plain of w. New South Wales or the Nullarbor Plain of South Australia and Western Australia is just how similar the plant life looks to that of the South African **SUCCULENT KAROO**, Andean **SUCCULENT PUNA**, or the North American **SAGEBRUSH SHRUBLAND**. This ‘cold’ desert and semi-desert environment is dominated by succulent plants of the saltbush (*Chenopodioidae*) subfamily (of the amaranth family), which have succulent leaves, salt-excreting mechanisms, and granular foliage to help them conserve water and manage high salt concentrations. Chenopod Shrubland forms in regions with good soils and semiarid to Mediterranean arid climates (Köppen **Bsk–Csa**) with rainfall generally between 8 and 16 in. (200–400 mm) per year, falling mainly in the winter months. Winter nighttime temperatures can drop below freezing, and the summer daytime highs can be a scorching 104°F (40°C).

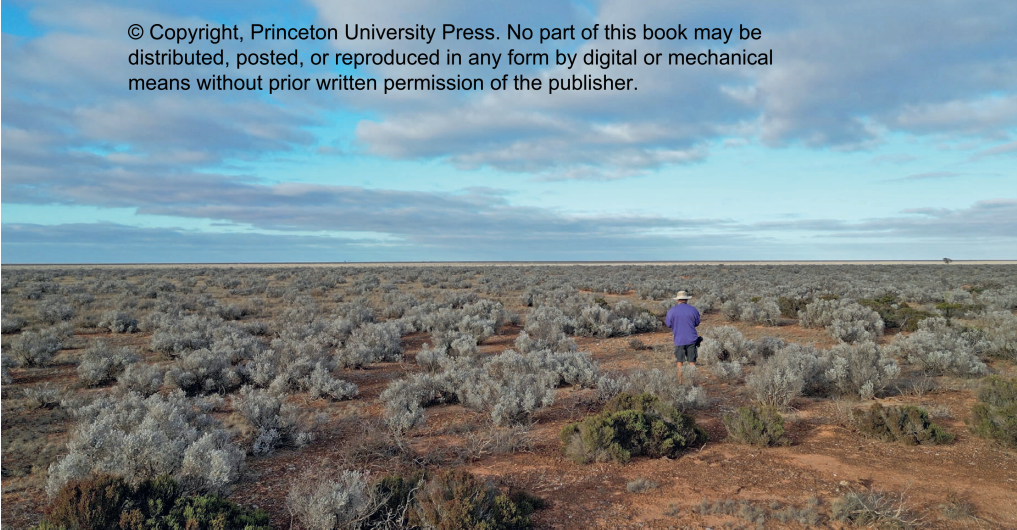
The best-known and most extreme examples of this habitat are on the Nullarbor Plain, a massive area straddling the South Australia–Western Australia



The seemingly uniform Chenopod Shrubland of the Nullarbor Plain, stretching for 300 mi. (500 km), contains localised hotspots for the Nullarbor Quail-thrush. © IAIN

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UNSW E&ER



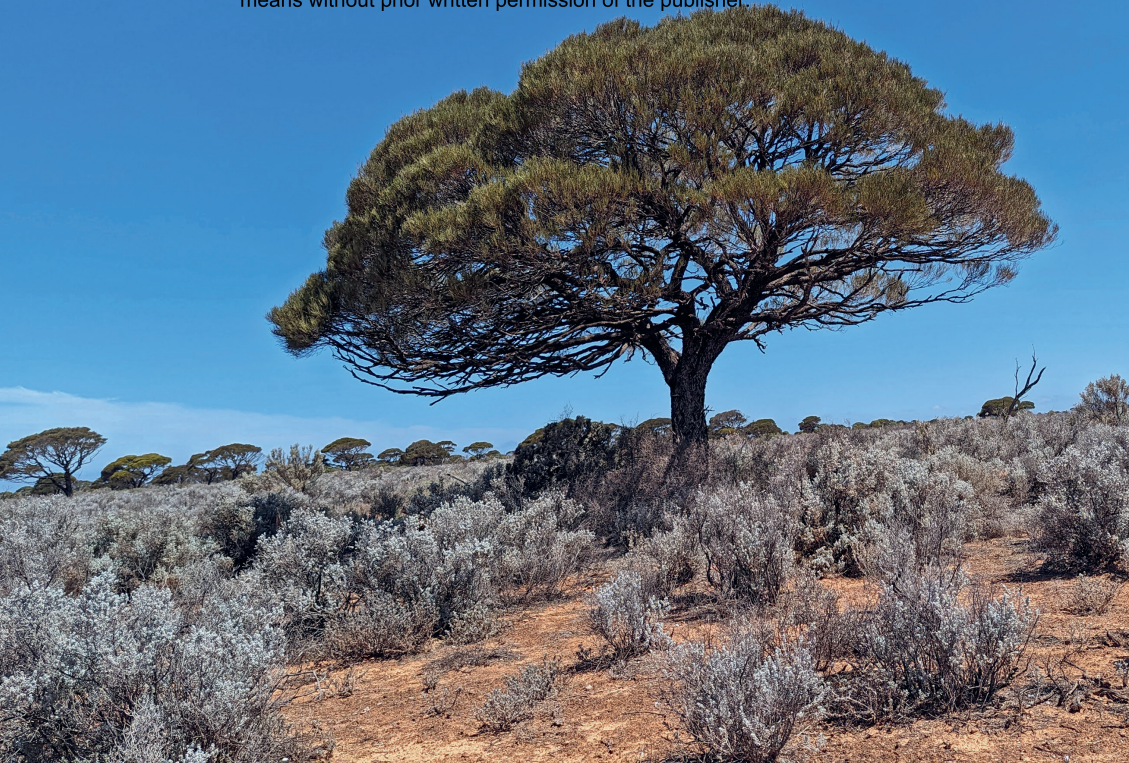


The vast Nullarbor Plain (77,000 sq. mi/200,000 km²) of s. Australia is home to the largest expanses of Chenopod Shrubland. © IAIN CAMPBELL, TROPICAL BIRDING TOURS/UNSW E&ERC

border near, and occasionally abutting, the southern coastline of Australia. Similar habitats exist over many aeolian (wind-blown) silt deposits, alluvial plains, and soils derived from underlying limestone parent material. This region is defined by the apparent scarcity of plant life; it is an open habitat where trees struggle to take hold, and its vegetation consists mainly of low, open shrubs, only 1–3 ft. (30–100 cm) tall, dominated by the chenopods Pearl Bluebush (*Maireana sedifolia*), Rosy Bluebush (*Maireana erioclada*), Black Bluebush (*Maireana pyramidata*), Berry Saltbush (*Atriplex semibaccata*), Toothed Saltbush (*Atriplex acutibractea*), and Bladder Saltbush (*Atriplex vesicaria*), especially on clay soils; and Black Bluebush (*Maireana pyramidata*) on very calcareous soils. The best-known and largest of all the chenopods is the extremely hardy Old Man Saltbush (*Atriplex nummularia*), which is even more halophytic (salt-tolerant) than the bluebushes (*Maireana* spp.) and also does well in highly alkaline conditions. It is the largest species of Australian saltbush, growing to 9 ft. (3 m) high and 12 ft. (4 m) wide, and looks very similar to salt cedar (*Tamarix*) stands of the African Sahel. Not all succulent-looking plants are chenopods, and visitors can be fooled by Bluebush Daisy (*Cratystylis conocephala*), which looks remarkably like the dominant bluebushes and is found throughout Chenopod Shrubland.

Between the chenopod shrubs, the ground can be bare for months, or in some cases years, supporting only a few perennial grasses such as Tall Feathergrass (*Austrostipa elegantissima*), but after rains, the red earth is covered with ephemeral forbs such as Sturt's Desert Pea (*Swainsona formosa*), Pygmy Sunray (*Rhodanthe pygmaea*), Showy Daisy-Bush (*Olearia pimeleoides*), and Poached-egg Daisy (*Myriocephalus stuartii*), which can form a thick blanket of yellows and whites.

A prominent subhabitat of Chenopod Shrubland is **Chenopod Woodland**, which although distinct in appearance from the treeless plains, has a near-identical animal and shrub-layer plant assemblage. It differs in that it has very scattered emergent trees, generally species such as Western Myall (*Acacia papyrocarpa*), Mulga (*Acacia aneura*), and Sugarwood (*Myoporum platycarpum*), which grow to 15 ft. (5 m) tall, and the occasional Kariku Sheoak (*Casuarina pauper*), which can reach 24 ft. (8 m) and at a distance resembles Desert Sheoak (*Allocasuarina decaisneana*) from the hotter regions of c. Australia. However, most spectacular are the areas with Western Myall, with its short trunk, rounded, dense, and often lopsided crown, drooping branches with phyllodes (expanded leaf stalks) rather than true leaves nearly touching the ground, and the underlying bluebushes, giving the impression of a landscape in East Africa.



Chenopod Woodland, as on this slope, is a conspicuous subhabitat with taller, emergent trees that provide an important component for nesting parrots and raptors. The ground cover is a mixture of true chenopods such as bluebushes and pseudo-chenopods such as Bluebush Daisy. © IAIN CAMPBELL, TROPICAL BIRDING TOURS/UNSW E&ERC

Chenopod Shrubland can be of both natural origin and anthropogenic, derived through the clearing of semiarid habitats such as **SHRUBBY AND CHENOPOD MALLEE** and **GRASSY MULGA**, and much of the Hay Plain that is now treeless shrublands could have originally been the e. Australian equivalent of the Western Myall-dominated Chenopod Woodland subhabitat. Within Chenopod Shrubland there is degradation through overgrazing, with some areas that were once dominated by Old Man Saltbush and Bladder Saltbush becoming replaced by less palatable (to the sheep at least) Giant Red Burr (*Sclerolaena tricuspis*), Galvanised Burr (*Sclerolaena birchii*), and Australian Boxthorn (*Lycium austral*). Other plants, such as Round-leaved Pigface (*Disphyma crassifolium*), found in the chenopod habitats of both Australia and South Africa, are becoming more common with rising soil salinity.

WILDLIFE: While the overall number of bird species is quite low in Chenopod Shrubland compared to more wooded habitats, it has far more species than other open terrain habitats such as **GIBBER CHENOPODLAND** and many more than **TEMPERATE TUSSOCK GRASSLAND**. A high percentage of the species present are specialists to this habitat, such as Thick-billed Grasswren, Nullarbor Quail-thrush, Cinnamon Quail-thrush, Inland Dotterel, Plains-wanderer, Chestnut-breasted Whiteface, Banded Whiteface, and Redthroat. Other ground birds include Banded Lapwing, Little Buttonquail, Australian Pratincole, Orange Chat, and Brown Songlark.



White-winged Fairywren, widespread across arid and semiarid s. Australia, is particularly common in Chenopod Shrubland. Singing Honeyeater and Spiny-cheeked Honeyeater eke out an existence on plants such as *Eremophila* spp., but honeyeaters are not well represented in this habitat because many of the chenopods are wind-pollinated and do not provide the vast amount of nectar provided by species of *Grevillea*, *Banksia*, or *Melaleuca* in other shrublands and heathlands.

In the Chenopod Woodland subhabitat, the widespread emergent trees provide important habitat for the obligate Naretha Bluebonnet, as well as nesting sites for Scarlet-chested and Mulga Parrots. Raptors also require trees for nesting, and although they hunt over the shrubland, it is in these trees that diurnal raptors such as Black-shouldered Kite, Brown Falcon, Nankeen Kestrel, and Wedge-tailed Eagle build nests, and in their hollows that the nocturnal Australian Owlet-nightjar roosts and nests. A suite of arboreal birds such as Black-faced Cuckooshrike, Black-faced Woodswallow, and Dusky Woodswallow also require the trees. Blossom nomads, typical of mallee habitats, are not common in Chenopod Woodland or other Chenopod Shrubland, as the tree density is not high enough to provide an adequate food source.

Orange Chat is a widespread Outback species that is especially abundant in Chenopod Shrubland. © BEN KNOOT





Left: Lizards, such as this Central Bearded Dragon, are a conspicuous feature of Chenopod Shrubland, along with other dragon species like Nullarbor Earless, Gibber Earless, and Claypan Dragons.

© JUN MATSUI, SICKLEBILL SAFARIS

Opposite: Plains-wanderer is a rare enigmatic species (and monotypic bird family) that is a target for birders in Chenopod Shrubland.

© SAM WOODS, TROPICAL BIRDING TOURS

Most of the mammals that exist here are small marsupial mice or bats. The larger mammals include Euro (a subspecies of Common Wallaroo), Red Kangaroo, and Dingo. Unfortunately, feral cats have thrived in this habitat and seriously depleted native mammal and reptile populations.

Lizards are the most abundant animals of Chenopod

Shrubland. Amid the samphire (salt-tolerant plants in the family Amaranthaceae) and chenopod shrubs, expect to find lizards like Central Bearded Dragon (*Pogona vitticeps*), Saltbush Slender Bluetongue (*Cyclodomorphus venustus*), Claypan Dragon (*Ctenophorus salinarum*), and Nullarbor Earless Dragon (*Tympanocryptis houstoni*).

CONSERVATION: Despite being in an arid part of Australia, the chenopods here are an incredibly rich resource for sheep farming, and it has been said that Adelaide (South Australia) was essentially built on the back of sheep and saltbush. This is not without serious consequence, and when travelling through this part of Australia, it is difficult to find areas that have not been seriously overgrazed. Outside of the Nullarbor Plain, there are few vast expanses where this habitat is protected properly.

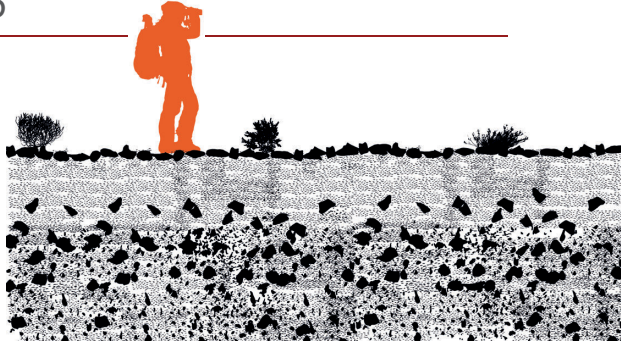
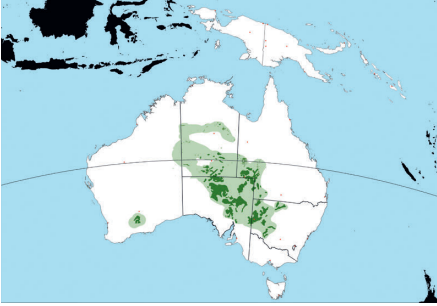
DISTRIBUTION: Chenopod Shrubland is found across arid and semiarid s. Australia, from the Yilgarn region of Western Australia to the Hay Plain of w. New South Wales. It occurs in small patches in Queensland and Northern Territory but is predominantly south of the central deserts. The biggest single block is the Nullarbor Plain, which is 77,000 sq. mi. (200,000 km²) of seeming emptiness (with just a few hundred people) abutting the Great Australian Bight.

The Chenopod Woodland subhabitat is found scattered through sw. New South Wales and within the Nullarbor Plain and exists as a massive arc around the north and west of the plain, where it forms the boundary between Chenopod Shrubland and the **GRASSY MULGA** woodlands of Western Australia and South Australia.

WHERE TO SEE: **CHENOPOD SHRUBLAND**—Booorooban, New South Wales, Australia; Eucla, Western Australia; Nullarbor Roadhouse, South Australia. **CHENOPOD WOODLAND**—Madura, Western Australia; between Hay and Deniliquin, New South Wales, Australia.



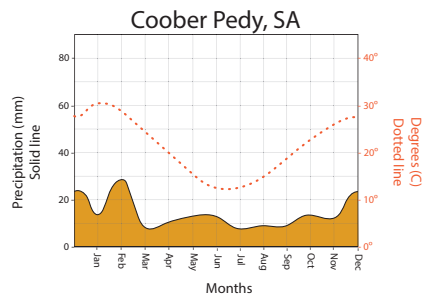
Au2E GIBBER CHENOPODLAND



IN A NUTSHELL: An extremely sparse, seemingly barren, rocky desert landscape that springs to life after very intermittent rains. **Global Habitat Affinities:** SAHARAN REG DESERT; CENTRAL MIDDLE EASTERN REG DESERT. **Continental Habitat Affinities:** CHENOPOD SHRUBLAND. **Species Overlap:** ROCKY SPINIFEX DESERT; DUNE SPINIFEX DESERT; CHENOPOD SHRUBLAND. **Full Bird Assemblage:** habitatsoftheworld.org/Au2E.

DESCRIPTION: Gibber Chenopodland is both a landform and a habitat type, formed over desert pavement, the Australian equivalent of SAHARAN REG DESERT of Africa. These pavements form in areas where deflation from winds has eroded most of the finer sands and silts, winnowing small pebbles and cobbles (gibbers) so that they are left covering the ground, protecting the underlying material from erosion. Hypersaline waters in the desert transport calcium and silica and can deposit a patina (thin film) of silica mixed with iron oxides (magnetite and hematite) on the gibbers, which can become varnished with silica, giving them a shiny, smooth texture approaching a glassy black sheen.

In some places, such as the Strzelecki Track, it is possible to see no trees or large shrubs and, in dry periods, very few forbs or grasses. This habitat can appear to be one of the most hostile places on the planet, with shimmering light reflecting from the polished gibbers. The rare permanent trees are dominated by desert species such as Bastard Mulga (*Acacia sibirica*), Mulga (*Acacia aneura*), and Kariku Sheoak (*Casuarina pauper*), growing as stunted bushes and trees less than 12 ft. (4 m) tall, with taller Coolabah (*Eucalyptus coolabah*) and River Red Gum (*Eucalyptus camaldulensis*) trees indicating an inland drainage system. After rains, the whole impression changes as the area bursts into life: chenopods such as Pearl Bluebush (*Maireana sedifolia*), Low Bluebush (*Maireana astrotricha*), Bladder Saltbush (*Atriplex vesicaria*), Pop Saltbush (*Atriplex holocarpa*), and Hedge Saltbush (*Rhagodia spinescens*) thicken and grow to 3 ft. (1 m) tall, and perennial grasses such as Feathertop Wiregrass (*Aristida latifolia*) and Roebourne Plains Grass (*Eragrostis xerophila*) grow rapidly. In the 'good' (wet) years, ephemeral grasses such as Pretty Wanderrie Grass (*Eriachne pulchella*) can form blankets that give the impression of a short desert grassland of Asia, and in other areas forbs such as Common White Sunray (*Rhodanthe floribunda*) and Erect Yellowheads (*Gnephosis arachnoidea*) rapidly grow and bloom to give the impression of ASIAN FLOWER STEPPE of w. Asia.





Gibber Chenopodland appears barren and lifeless, but it can erupt with a flush of birdlife following heavy rains. Very strong winds can whip up sandstorms (making doing a podcast near impossible).

© GABRIEL CAMPBELL, TROPICAL BIRDING TOURS

Small, burnt red pebbles and cobbles (gibber) with a distinctive, varnished appearance are characteristic of the desert floor of Gibber Chenopodland. They accumulate on the surface through wind erosion of the surrounding fine sands and silts. Once enough have accumulated, they form a protective cap stopping further erosion. © IAIN CAMPBELL, TROPICAL BIRDING TOURS/UNSW E&ERC





Gibberbird is an indicator species for Gibber Chenopodland, although it is never abundant and is very thinly distributed within these vast plains. © BEN KNOOT

WILDLIFE: Those birds that occur are special species highly restricted to gibber desert habitats, including Gibberbird and Inland Dotterel. Chenopod and samphire specialists include Chestnut-breasted Whiteface, Orange Chat, Plains-wanderer, and White-fronted Chat. Where the chenopods are low, widely spaced, and close to spinifex, the Night Parrot can use this habitat. Cinnamon Quail-thrush is another species found in Gibber Chenopodland, especially where there are small patches of spinifex (*Triodia*) in the mix of chenopods

Most of the mammals that exist here are small marsupial mice or bats. The larger mammals are the Euro (a subspecies of Common Wallaroo), Red Kangaroo, and Dingo. Smaller mammals living here include Kultarr, Long-haired Rat, and various hopping mice (*Notomys* spp.).

Because these shrublands appear to support few birds and mammals, lizards are the most abundant vertebrates. Amid the samphire and chenopod shrubs, expect to find lizards like the Sand Goanna (*Varanus gouldii*), Eastern Tree Dttella (*Gehyra versicolor*), Saltbush Slender Bluetongue (*Cyclodomorphus venustus*), Claypan Dragon (*Ctenophorus salinarum*), and Nullarbor Earless Dragon (*Tympanocryptis houstoni*). In the gibber plains even more specialised lizards include the Gibber Gecko (*Lucasium byrnei*), Gibber Dragon (*Ctenophorus gibba*), Gibber Earless Dragon (*Tympanocryptis intima*), and the bizarre looking Goldfields Pebble Dragon (*Tympanocryptis pseudopsephos*). Snakes include the venomous Shield-snouted Brown Snake (*Pseudonaja aspidorhyncha*).

CONSERVATION: Although this landscape can look untouched by modern humans, feral cats have thrived in this habitat and seriously depleted native mammal and reptile populations. Farming is very limited, but massive pastoral leases are held, and it is possible to see large flocks of sheep in

what initially looks completely barren. Much of the grazing is on ephemeral growth after rare rains, so the sheep have to be moved around frequently to find viable livestock fodder.

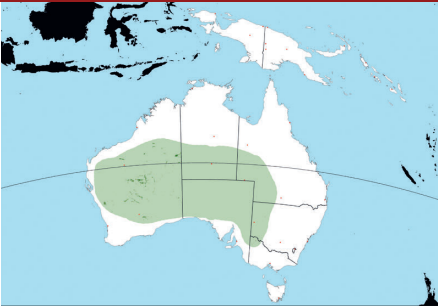
DISTRIBUTION: Gibber Chenopodland occurs from e. Western Australia to nw. New South Wales and is most prevalent in n. South Australia. It is the main habitat of the Sturt Stony Desert (New South Wales) and Gibson Desert (Western Australia). It also occurs along the Strzelecki (South Australia) and Birdsville (Queensland–South Australia) Tracks; around Coober Pedy (South Australia); and in far sw. Queensland.

WHERE TO SEE: Coober Pedy, South Australia; Mungeranie, South Australia; Birdsville, Queensland, Australia.

Inland Dotterel is another indicator species for Gibber Chenopodland; it is very inconspicuous as it is most active after nightfall. © SAM WOODS, TROPICAL BIRDING TOURS



Au2F SAMPHIRE FLAT

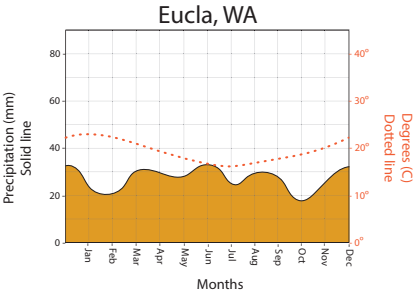


IN A NUTSHELL: A very low, single-layer vegetation dominated by salt-tolerant samphire plants. **Global Habitat Affinities:** NORTH AMERICAN SAGEBRUSH SHRUBLAND; CASPIAN WORMWOOD DESERT.

Continental Habitat Affinities: SALT PAN. **Species Overlap:** SALT PAN. **Full Bird Assemblage:** habitatsoftheworld.org/Au2F.

DESCRIPTION: Samphire Flat is a distinctive and ecologically important habitat type in Australia. Samphires are halophytes (salt-tolerant plants) in the family Amaranthaceae with jointed stems and small scale-like leaves. They vary in colour from green to reddish and have several adaptations allowing them to survive in high-salinity environments, such as succulent leaves and stems that store water and excrete excess salt. Samphires play an important role in the ecosystem by helping to stabilise soil, reduce erosion, and provide habitat for wildlife. The diversity of environments in which Samphire Flat is found includes lagoons, clay pans, gypsum lakes, and semi-seasonal wetlands. These habitats occur in regions with disorganised drainage systems, where water flows into salt lakes, creating unique ecological conditions. These areas can range from being seasonally inundated to filling only after extreme rainfall events. The variable conditions contribute to the distinctive halophytic plant community. The samphires found on inland Samphire Flat, primarily in the genus *Tecticornia*, flourish in the challenging conditions found on the margins of salt lakes and saline flats. Some of the more prevalent species include Mungily (*Tecticornia indica*), Grey Samphire (*Tecticornia halocnemoides*), and *Tecticornia disarticulata*.

Samphire plants typically cover up to 30% of Samphire Flat habitat. This vegetation is often found in zones where only the most salt-tolerant plants can survive. Surrounding the samphires, a zone of saltbushes (*Atriplex*, *Maireana*, and *Frankenia* spp.) usually forms a fringe, creating a layered and complex plant community. Some other notable species associated with Samphire Flat include Round-leaved Pigface (*Disphyma crassifolium*), *Sclerolaena deserticola*, and Shrubby Twinleaf (*Roepera aurantiaca*); these plants are also adapted to the saline and often inundated conditions of the habitat. Lake Carnegie (Western Australia) features a rich halophyte community with species such as Black Bluebush (*Maireana pyramidata*) and various annuals. Lake Austin is a gypsum-rich lake south of Cue (Western Australia), characterised by a mosaic of saltbush, bluebush, and samphire vegetation and also home to Helms' Mallow (*Lawrenzia helmsii*) of the Malvaceae family.





Samphire Flat is characterised by a single layer of stunted vegetation comprising many salt-tolerant plants that can cope with the highly saline environment. © SHANE KENNEDY, TROPICAL BIRDING TOURS

Coastal Samphire Flat subhabitat and inland Samphire Flat differs in several ways due to the varying conditions and effects they experience. Inland Samphire Flat often forms around salt lakes and ephemeral water bodies where salinity levels can fluctuate dramatically, sometimes becoming extremely saline. Coastal Samphire Flat is influenced by tidal saltwater, leading to more stable salinity levels, and typically has more consistent water availability due to tides, whereas inland flats rely on irregular rainfall and water flows, making them more variable and sometimes dry for extended periods. Coastal areas generally have milder climates, influenced by the ocean, with less temperature variation. Inland areas can experience more extreme temperatures, both hot and cold, and more erratic weather patterns. Coastal Samphire Flat is often more impacted by human activities such as development, tourism, and pollution. While both types of flats support halophytic plants, the species composition can differ. Coastal flats may have a greater diversity of marine-influenced vegetation, whereas inland flats might have species adapted to harsher, more arid conditions. Some plant species typical of Coastal Samphire Flat include Blackseed Glasswort (*Tecticornia pergranulata*), Beaded Samphire (*Salicornia quinqueflora*), and Austral Seablite (*Suaeda australis*), which all thrive with the more consistent salinity and water availability provided by tidal environments.

WILDLIFE: Samphire Flat appears to support few birds, although the critically endangered nocturnal Night Parrot feeds on Samphire Flats near spinifex in c. Australia, and this may be an extremely important habitat for the species. Orange Chat shows some preference for this habitat inland, and Crimson Chat might also be seen. Several raptors can be found in these areas, and



Fat-tailed Dunnart is a nocturnal, mouse-like marsupial that occupies this habitat.

© CHARLEY HESSE, TROPICAL BIRDING TOURS

Brown Falcon, Nankeen Kestrel, and even Swamp and Spotted Harriers may fly over it. Of course you may see an Emu passing through, or some more common open-country species such as Crested Pigeon, Banded Lapwing, Zebra Finch, or Australian Pipit. Mammal-wise, you might see Red Kangaroo, the small nocturnal Fat-tailed Dunnart, or a Dingo if you are lucky.

Lizards are probably the most numerous vertebrates, and some species present in this habitat may include Claypan Dragon (*Ctenophorus salinarum*), Crested Bicycle-Dragon (*Ctenophorus cristatus*), Lozenge-marked Dragon (*Ctenophorus scutulatus*), Midline Knob-tailed Gecko (*Nephurus vertebralis*), and Common Desert Ctenopus (*Ctenopus leonhardii*).

Coastal Samphire Flat harbours a few more interesting bird species than inland flats. White-fronted Chat has a fairly strong association with this habitat, as does the critically endangered Orange-bellied Parrot on its wintering grounds. Blue-winged Parrot makes some use of the habitat in cold coastal areas such as in Tasmania.

CONSERVATION: Although this habitat does not face threats from clearing, it is susceptible to changes in the hydrology of the ephemeral creeks that drain into it. A more significant recent threat is the discovery that many samphire flats overlie mineral deposits such as lithium and potash. This is regarded as a low-value habitat, and there is little political will to place better environmental protections for it.

DISTRIBUTION: Samphire associations cover huge areas of Western Australia, predominantly in the Murchison and Gascoyne bioregions, with significant presence in the Great Sandy Desert, Carnarvon, and several other regions. The Murchison bioregion, for instance, hosts the largest area of salt lakes in Western Australia, including Lake Barlee, Lake Moore, and Lake Ballard.



Above: Samphire Flats have a relatively depauperate birdlife. Most of the bird species that occur are widespread (none are restricted to it) and found in a variety of habitats, like this Banded Lapwing. © SAM WOODS, TROPICAL BIRDING TOURS

Below: While none of them are restricted to Samphire Flat, a number of chat species occur, such as this White-fronted Chat as well as Crimson and Orange Chats. © BEN KNOOT

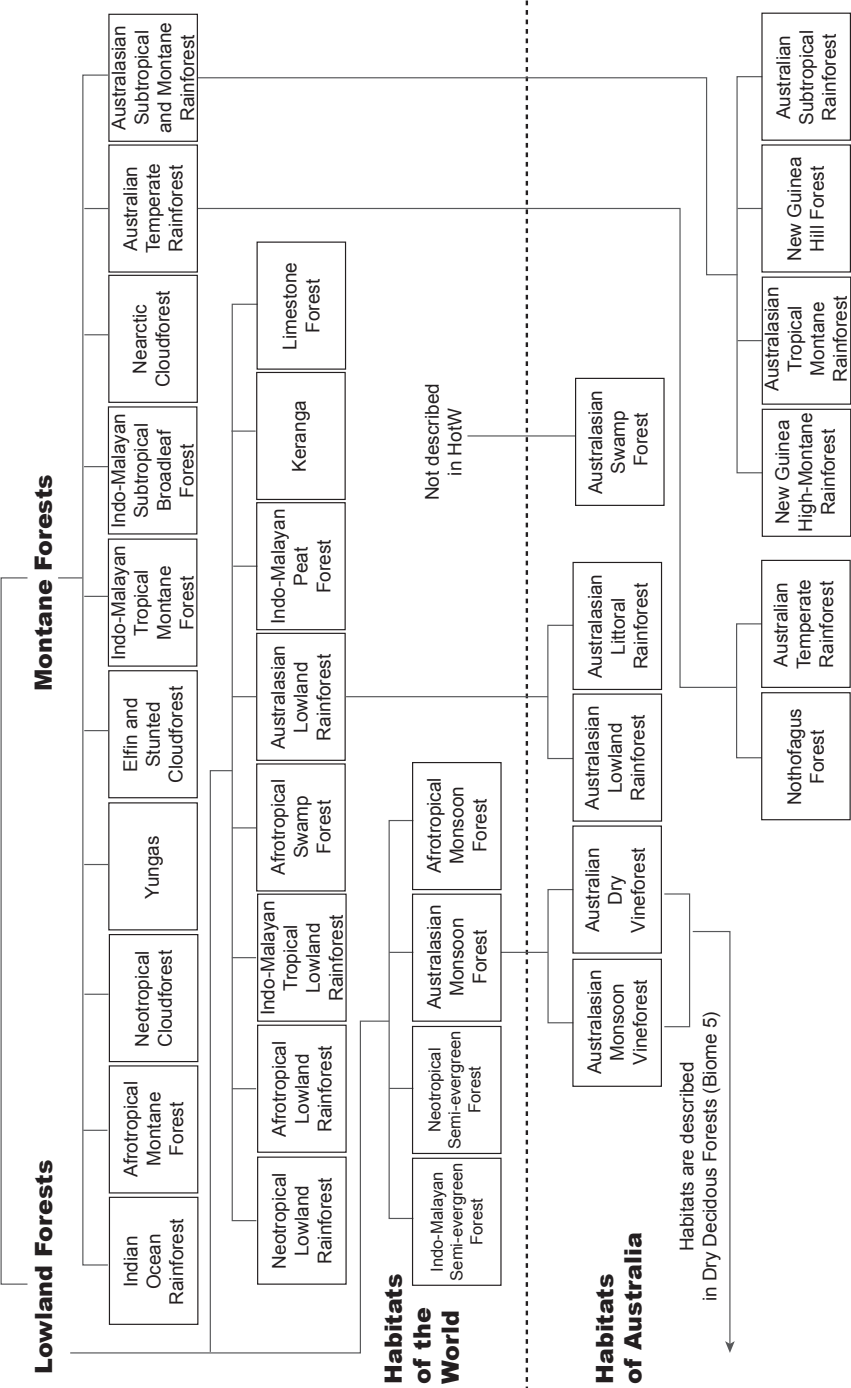
The **Coastal Samphire Flat** subhabitat occurs all around Australia and islands to the north. In the tropics, it is almost always on the inside edge of mangroves and rarely forms areas large enough for a different animal assemblage, so is used by the same animals as surrounding grasslands and mangroves. The habitat becomes much more common in temperate parts of Australia, where it is the dominant estuarine habitat and so is found on most temperate coastlines, in most bays with **TIDAL MUDFLATS**, and other areas away from rocky shorelines.

WHERE TO SEE: SAMPHIRE FLAT—Lake Ballard, Lake Austin, and Lake Barlee, Western Australia. **COASTAL SAMPHIRE FLAT**—Boondall Wetlands near Brisbane, Queensland, Australia; Botany Bay, near Sydney, New South Wales, Australia; Bruny Island, Tasmania; Coorong National Park, South Australia.



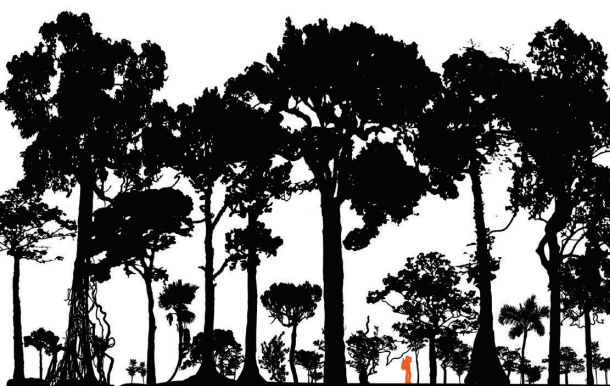
Australasian Humid Forests Dendrogram (Biome 4)

World Humid Forests



HUMID BROADLEAF FORESTS

Au4A AUSTRALASIAN LOWLAND RAINFOREST



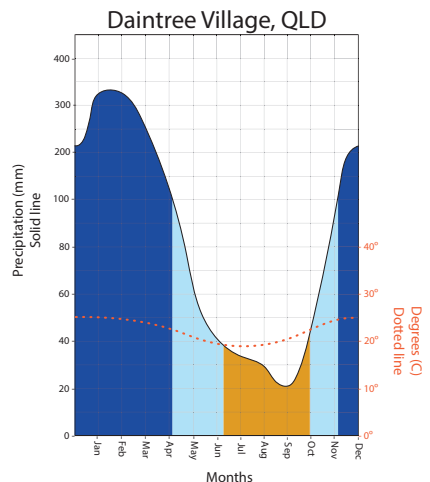
IN A NUTSHELL: Tall, very humid forests found at low elevations. **Global Habitat Affinities:**

AMAZON TERRAFIRMA; ASIAN LOWLAND TROPICAL RAINFOREST; AFROTROPICAL

LOWLAND RAINFOREST. Continental Habitat Affinities: **SUBTROPICAL RAINFOREST.** Species Overlap: **SUBTROPICAL RAINFOREST; SWAMP FOREST.** Full Bird Assemblage: habitatsoftheworld.org/Au4A.

DESCRIPTION: Australasian Lowland Rainforest is the dominant vegetation type in low-lying, wet (but not submerged) tropical environments of New Guinea, surrounding islands, and ne. Australia. It occurs from sea level to about 2000 ft. (600 m) in areas with high annual rainfall of 120+ in. (1300+ mm). However, this habitat extends over a wide latitudinal range, occurring from hot equatorial climates with year-round rainfall (Köppen **Am**) to tropical monsoonal/savanna climates with dry winters and hot, very wet summers (**Am/Awa**).

Much of Australasian Lowland Rainforest occurs more than 1.2 mi. (2 km) from the coast, is greatly reduced by past clearance, and is now categorised as endangered by the Australian federal government. It is characterised by a mega-diverse plant community comprising a large variety of evergreen trees that form a thick canopy (70%+ canopy cover), which blocks out the sun, resulting in a relatively open understorey. The forest canopy here is high, at around 130 ft. (40 m). In light gaps created by treefalls or landslides, there are massive bursts of seedlings of larger trees and early successional trees. These plants compete





Lowland Rainforest has a tall canopy reaching around 130 ft. (40 m).

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Australasian Lowland Rainforest occurs in wet, tropical environments below 1000 ft. (300 m) elevation. The high diversity of tree species gives it an unkempt, messy appearance at both ground and canopy level. © IAIN CAMPBELL, TROPICAL BIRDING TOURS/UNSW E&ERC



(continued...)

INDEX

Note: Common names of species are indexed, unless there is no common name in which case the scientific name is indexed.

Habitats are worded **in full** in the index beginning with the word Australasian, or Australian, where relevant. The words 'Australasian or Australian' has been dropped from references to habitats within the *actual* text e.g. 'Lowland Rainforest' refers to *Australasian* Lowland Rainforest (see page 9).

Page numbers in **bold** indicate photographs.

Species mentioned in passing *without* further information have not been indexed. The Introduction, and geographical/geological/climatic features have not been indexed. The emphasis of the index is on species and the habitat types.

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