



# NVIS Fact sheet

## MVG 22 – Chenopod shrublands, samphire shrublands and forblands

Australia's native vegetation is a rich and fundamental element of our natural heritage. It binds and nourishes our ancient soils; shelters and sustains wildlife, protects streams, wetlands, estuaries, and coastlines; and absorbs carbon dioxide while emitting oxygen. The National Vegetation Information System (NVIS) has been developed and maintained by all Australian governments to provide a national picture that captures and explains the broad diversity of our native vegetation.

This is part of a series of fact sheets which the Australian Government developed based on NVIS Version 4.2 data to provide detailed descriptions of the major vegetation groups (MVGs) and other MVG types. The series is comprised of a fact sheet for each of the 25 MVGs to inform their use by planners and policy makers. An additional eight MVGs are available outlining other MVG types.

For more information on these fact sheets, including its limitations and caveats related to its use, please see: 'Introduction to the Major Vegetation Group (MVG) fact sheets'.

### Overview

Typically, vegetation areas classified under MVG 22 – Chenopod shrublands, samphire shrublands and forblands:

- comprise overstoreys dominated by a range of hardy (drought and salt tolerant) low shrub species typically belonging to various genera of Chenopodiaceae (now included by some authorities in Amaranthaceae), a prominent plant family in deserts worldwide with a distribution extending across temperate and subtropical arid zones of central Asia, Africa, Australia and the Americas
- are widespread in southern arid and semi-arid rangelands on extensive clay plains, undulating gibber hills and plains, aeolian sandplains and hypersaline flats including salt lakes and the coastal fringe
- feature continental distribution is primarily at temperate latitudes, extending to inland subtropical climates in parts of central and Western Australia
- feature succulent expressions associated with salt lakes and the upper inter-tidal zone
- feature chenopods that have a deep evolutionary history within Australia, suggesting evidence of a desert flora in parts of southern Australia in the mid-tertiary era when much of the continent was covered with rainforest
- dominate where rainfall, local soil moisture and heavy subsoil texture, sometimes in combination with high soil salinity, largely prevent the development of tree dominant vegetation, although scattered trees of various genera may be present.

## Facts and figures

<b>Major Vegetation Group</b>	MVG 22 - Chenopod shrublands, samphire shrublands and forblands
<b>Major Vegetation Subgroups</b>	31. Saltbush and bluebush shrublands
<b>(number of NVIS descriptions)</b>	39. Mixed chenopod, samphire +/- forbs
	Closed chenopod shrubland (tall, low)
	Chenopod shrubland (mid, low)
<b>Typical NVIS structural formations</b>	Open chenopod shrubland (mid, low)
	Samphire shrubland (mid, low)
	Open forbland (tall, mid, low)
<b>Number of IBRA regions</b>	68
<b>Most extensive in IBRA region</b>	Nullabor Plain (SA and WA)
<b>(Est. pre-1750 and Present)</b>	
<b>Estimated pre-1750 extent (km<sup>2</sup>)</b>	504 089
<b>Present extent (km<sup>2</sup>)</b>	489 176
<b>Area protected (km<sup>2</sup>)</b>	85 740



Coastal saltmarsh, Towra Point, NSW (Photo: B.Pellow).



## Structure and physiognomy

- Structure varies from mid-dense shrubland up to two m tall in the most productive sites, to mixed low sparse shrubland/grassland less than 0.3 m tall on dry stony plains, to succulent forbland of varying density up to one m tall in hypersaline substrates.
- A matrix of grasses and forbs between the shrubs is highly variable in cover and composition, depending on drought cycles and the seasonal timing of rainfall events.
- Scattered emergent trees and shrubs are sometimes present.
- Arid shrublands may occur in structurally uniform tracts across extensive plains or in mosaics with woodlands or as bands aligned along topographic contours.
- The shrubland dominants may be monospecific or occur in mixed stands of two or more species.
- Most shrubs have semi-succulent or succulent nanophyll (0.25–2.5 cm<sup>2</sup>) leaves, some with vesicular hairs that burst to exclude salt from leaf tissue, or with internal reservoirs (vacuoles) that accumulate salts, limiting its concentration within living tissues.

## Indicative flora

- Chenopodiaceae is the dominant family of MVG 22. Common genera include *Atriplex* and *Rhagodia* (Salt Bush), *Chenopodium*, *Maireana* (Blue Bushes, Cotton Bush), *Sclerolaena* (Copper Burrs), *Sarcocornia* (Samphires) and *Tecticornia*. Species are typically salt and drought tolerant across these communities.
- Saltbush shrublands include *Atriplex vesicaria*, *Atriplex nummularia*, *Maireana aphylla*, *Rhagodia spinescens*,

*Sclerolaena muricata* and *Nitraria billardieri* species. The ground layer may include a range of smaller chenopods, *Asteraceae* genera, *Disphyma* and grasses including species of *Sporobolus*, *Chloris* and *Eragrostis* with *Astrebla* in the north and *Austrodanthonia* in the south. Scattered trees of *Eucalyptus*, *Acacia* or *Casuarina* may emerge above the shrub layer.

- Bluebush shrublands are dominated by *Maireana sedifolia* and *M. pyramidata* with *Atriplex vesicaria* and *A. acutibractea*, mainly in localised depressions. The ground layer may include *Cratystylis conocephala*, *Dissocarpus paradoxa*, *Sclerolaena obliquicuspis*, *Rhodanthe floribunda*, *Ptilotus obovatus*, *Pycnosorus pleiocephalus*, *Zygophyllum* species and grasses such as *Austrodanthonia setacea*, *Austrostipa elegantissima* and *Eragrostis dielsii*.
- Samphire communities comprise succulent sub-shrubs, shrubs and forbs dominated by *Halosarcia*, *Salicornia*, *Sclerostegia*, *Suaeda* and *Sarcocornia* genera. Samphire associated with salt lakes includes a diversity of *Tecticornia* and *Sarcocornia* species, often associated with species of *Frankenia*, *Disphyma* and a range of ephemeral forbs and grasses. Samphires may also be associated with coastal saltmarsh.
- Coastal saltmarshes are complex mosaics of salt tolerant sedgeland, grasslands and open herbfields with occasional emergent shrubs. Succulent forb and shrub genera generally dominate and include *Sarcocornia*, *Samolus*, *Suaeda*, *Selliera*, *Tecticornia* and *Triglochin*; though these may be interspersed or even dominated by reeds and sedges such as *Juncus kraussii* and *Baumea juncea*, or grasses such as *Sporobolus virginicus*, and *Zoysia micranthus*. Tropical coastal saltmarshes are sparsely vegetated and markedly less species rich, with *Batis*, *Sesuvium* and *Sporobolus* being the major genera.



*Leucochrysum albicans* (Hoary Sunray) and *Tetratheca* spp., Brindabella Ranges, ACT (Photo: M. Fagg)

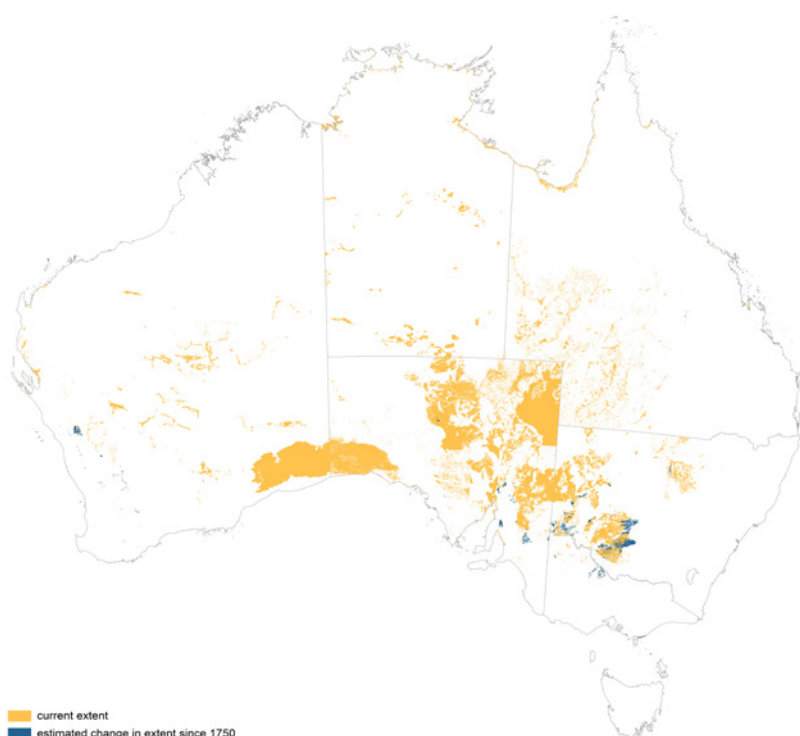
## Environment

- With the exception of coastal saltmarshes, chenopod shrublands are restricted to dry climates where mean annual rainfall is less than 350 mm and typically 125 and 270 mm.
- Associated with extensive inland riverine plains, clay pans, aeolian sand plains and lunettes, limestone plateaus, gibber plains and on estuarine mud flats.
- Soils range from heavy clays to calcareous red-brown sandy loams to estuarine muds, united by high pH and high levels of salinity, particularly sodium and calcium.
- Many species in arid and semi-arid forms of this MVG respond to a boom and bust cycle, responding to significant rainfall events in between long periods of drought.
- In many areas shrubs are relatively stunted as a result of waterlogging and seasonal extremes.
- Coastal saltmarshes occur at the upper inter tidal zone, periodically inundated by seawater. The distribution of different saltmarsh communities partly reflects local environmental gradients in salinity and water availability.
- Samphires occur around the margins of semi-permanent and ephemeral salt lakes of the arid inland, although some are found in close proximity to arid coastlines, particularly in association with coastal saltmarshes.

## Geography

- Widespread across Australia's rangelands, extending to subtropical climates and on coastal fringes in estuaries and inlets. Rarely at tropical latitudes except in restricted sites within estuaries.
- Largest area occurs in South Australia (268 005 km<sup>2</sup>).
- Extensive areas of chenopod shrublands occur on the Nullarbor Plain, the lower Lake Eyre basin, and the Hay Plain in New South Wales. They are also scattered through the southern arid zones of Queensland, Northern Territory and Western Australia, as well as far western New South Wales and north-west Victoria.
- Coastal saltmarshes occur in all states of Australia around the coastal fringe of the entire continent, confined to estuaries and inlets. Coastal distribution of saltmarsh is most extensive at temperate latitudes, with tropical occurrences more restricted and less species-rich. Saltmarshes require finer scale mapping within the NVIS.
- Although locally restricted, samphires are extensively distributed across arid plains of South Australia and Western Australia, with smaller occurrences in Victoria and New South Wales, and outside the tropics in Queensland and the Northern Territory.

The below image outlines the location of this MVG group in Australia.



## Change

- Approximately three per cent (14 913 km<sup>2</sup>) of the estimated pre-1750 extent cleared accounting for 1.4% of total clearing in Australia, with recent expansion of cropping on the Hay Plain.
- Rangeland chenopod shrublands have been affected by pastoral production through overgrazing by domestic and feral animals, leading to a reduction in the perennial component of vegetation.
- Overgrazing has impacted most heavily on saltbush shrublands, resulting in shifts of dominance from *Atriplex* to *Sclerolaena* spp., *Maireana aphylla* and ephemeral plants. These effects have been exacerbated by cycles of drought and a dieback disease that peaks after exceptionally wet years.
- Bluebush shrublands are more resilient to overgrazing, drought and disease, partly as a consequence of their lower palatability, deeper roots and greater longevity.
- The distribution of coastal saltmarsh has been reduced by development of urban, industrial and recreational infrastructure and port facilities in populated regions of the coastline. The Victorian distribution of coastal saltmarsh is estimated to have declined by 30-40% since European settlement to its current distribution of 192 km<sup>2</sup>.
- On Australia's south-east coast, there is evidence that saltmarsh is being invaded by mangroves, possibly in response sea level rise and increased frequencies of storm surge. Similar trends are evident in other countries such as Mexico.
- In the past fogging and drainage were used to control mosquitoes in coastal saltmarsh and samphire, where communities were close to urban environments. A more balanced approach to management is being advocated by coastal planning groups, recognising the importance of saltmarshes to coastal and estuarine fisheries.
- In semi-arid and arid landscapes, chenopod shrublands are important sources of grazing fodder for the Australian pastoral industry.
- Coastal and estuarine fisheries, providing the basis for prawn and fish industries. The value of saltmarsh communities for fisheries are well recognised (e.g. nutrient cycling and algal production within saltmarshes of the Gulf of Carpentaria underpin prawn populations, which provides the basis for the lucrative prawn fishery in the region).
- Saltmarsh and samphire wetlands also provide habitat for migratory species such as waders. These shrublands are home to a wide range of birds and mammals, including some rare and endangered species and migratory waders.
- Ecotourism, including bird watching and landscape features.

## List of key management issues

- Management of domestic livestock in rangelands.
- Location of artificial watering points in rangelands.
- Maintenance of natural hydrological regimes (e.g. depletion of ground water reserves, interruption of tidal flows, salinisation resulting from rangeland clearing).
- Development of coastal infrastructure.
- Weed control.
- Soil erosion due to loss of soil crust.
- Feral animal eradication and/or control to reduce pressure on native flora and fauna, particularly goats.
- Sea level rise and increased storm surge frequency in coastal saltmarsh.
- Long-term monitoring to inform future management strategies.

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## Key values

- Biodiversity conservation at the species and community levels.
- Evidence of an ancient arid Australian biome.
- Soil stabilisation binding soils in arid rangelands and coastal mudflats.
- Pastoral production in rangelands.
- Long term ecological research.



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## Data sources

Interim Biogeographic Regionalisation for Australia (IBRA), Version 7.

National Vegetation Information System, Version 4.2.

Collaborative Australian Protected Areas Database – CAPAD 2012 – Terrestrial.

## Notes

- Chenopod shrubs are also present as the understorey of other MVG's in the arid and semi-arid zones. These vegetation types have been assigned to other MVG's, based on the overstorey structure and composition.

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