21. DRYLAND SALINITY IN AUSTRALIA - KEY FINDINGS

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Replaces Fast Facts 11

The National Land and Water Resources Audit's dryland salinity risk assessment has, for the first time, objectively defined the distribution and impacts of dryland salinity across Australia.

The dryland salinity *risk assessment* of Australia has been undertaken in collaboration with State and Territory agencies. This assessment is based on the known incidence of salinity, soil characteristics, topography and groundwater - that is, groundwater within 2 metres of the soil surface or within 2 to 5m and with demonstrated rising water tables.

Prior to this report, the most recent estimate of the extent of dryland salinity in Australia was presented in the Prime Minister's Science, Engineering and Innovation Council report (PMSEIC 1998) on dryland salinity. Its findings are listed in Table 1 below beside the Audit's findings.

It's important to note the Audit's work is based on best available information and is constrained by the quantity and type of data available.

THE AUDIT'S KEY FINDINGS ON DRYLAND SALINITY

- Approximately 5.7 million hectares are within regions mapped to be at risk or affected by dryland salinity. The estimates are, that in 50 years this area may increase to just over 17 million hectares.
- Some 20 000 km of major roads and 1600 km of railways are already at risk—estimated to increase to 52 000 km and 3600 km respectively by 2050.
- Salt is transported by water—up to 20 000 km of streams could be significantly affected by 2050.
- Areas of remnant native vegetation and their ecosystems are at risk – about 630 000 ha. This is estimated to increase to approximately 2 million ha over the next 50 years.
- Australia rural towns are not immune—more than 200 towns could be affected by dryland salinity by 2050, with a larger number of villages and small localities also at risk.

Table 1. The Audit's assessment of the area of land at *high risk* of developing dryland salinity, now and by 2050. The last column shows previous estimates for the area of land *affected* by salinity (PMSEIC report 1998). All figures are hectares. The difference between the two sets of figures describes the improved analysis undertaken by the Audit and a change in definition from "area affected" (PMSEIC report) to "area at risk" (Audit's dryland salinity risk assessment).

	National Land and Water Resources Audit		PMSEIC report (Area affected by salinity)
State/Territory*	1998/2000	2050	1997
New South Wales	181 000	1 300 000	120 000
Victoria	670 000	3 110 000	120 000
Queensland	not assessed	3 100 000	10 000
Western Australia	4 363 000	8 800 000	1 804 000
South Australia	390 000	600 000	402 000
Tasmania	54 000	90 000	Not determined
Total	**5 658 000**	**17 000 000**	**2 476 000**

NOTES ON THE STATE DATA

- The ACT was not included as dryland salinity was considered to be very minor or salinity risks less than high. In the Northern Territory, a dryland salinity hazard assessment indicated no areas of high risk.
- The largest areas of dryland salinity are in the agricultural zone of southwest Western Australia. Groundwater levels in this region are still rising and over 4 million hectares are at risk; that figure could double by 2050.
- Large areas are also at risk of dryland salinity in South Australia, Victoria and New South Wales, mainly in the Murray–Darling Basin where groundwater levels are still rising.
- Although northern Australia has far less dryland salinity than temperate Australia, it could become a problem for many catchments with high salt stores if water balance changes led to groundwater rises.
- In Queensland, an estimated 3.1 million ha is considered to have a high hazard, and more rigorous assessments of the risks under land use are a priority.

CAUSES OF DRYLAND SALINITY

Changes in water balance cause dryland salinity. Tree clearing, reduced plant growth and thus reduced use of water in the soil increase the amount of water feeding into groundwater. This raises the groundwater and mobilises salts stored in Australia's soils.

Understanding how groundwater responds to changes in land use and water balance is the key to managing dryland salinity. Not all groundwater systems are the same. Increases in groundwater levels and therefore dryland salinity do not happen overnight. There are long responses and lag times—often 100 years or more.

IMPACTS OF DRYLAND SALINITY AS ESTIMATED BY THE AUDIT

Dryland salinity affects land and water resources on site, e.g. at the farm scale, elsewhere in the catchment, or outside the catchment (downstream). It is more pervasive than other forms of degradation but is closely linked to them (e.g. causing soil erosion, nutrient build-up in streams which sometimes promotes algal blooms, as well as the loss of plants from the river / creek edge leading to riverbank erosion and loss of wildlife habitat)

On farms, salinity reduces production, income and the capital value of land. Salinity damages infrastructure, salinises water storage, causes loss of farm flora and fauna and loss of shelter and shade. These effects are magnified at the regional level. Salinity can, and is having a substantial impact on public resources such as water supplies, roads, buildings and biodiversity.

Table 2. A summary of the national assets at high risk of being affected by dryland salinity

Asset	2000	2020	2050
Agricultural land (ha) (1)	4 650 000	6 371 000	13 660 000
Remnant and planted perennial vegetation (ha) (2) (5)	631 000	777 000	2 020 000
Length of streams and lake perimeter (km) (2)	11 800	20 000	41 300
Rail (km) (2)	1 600	2 060	5 100
Roads (km) (2)	19 900	26 600	67 400
Towns (number) (3)	68	125	219
Important wetlands (number) (1) (4)	80	81	130

(1) Data from all States, Qld only for 2050

(2) Data from WA, SA, Vic and NSW, Qld only for 2050

(3) Data from WA, SA, Vic and NSW

(4) Including Ramsar wetlands

(5) Much of the remnant and perennial vegetation reported for each State occurs on agricultural lands