Department of Agriculture and Fisheries, South Australia Leaflet No. 4053

the pastoral zone—reprieved?

In outback areas of South Australia, the recent bounteous rains have continued for so long that many people have concluded that the pastoral zone is rapidly recovering from past decades of drought and exploitation. Dramatic growth of vegetation has occurred on previously barren or eroding country. Has the pastoral zone been reprieved? **Brendan Lay,** ***Arid Lands Ecologist, has carried out detailed studies and gained some insight into this vital question.***

Before discussing the recent prolonged rains in South Australia's pastoral zone, let us consider the vegetation in an arid zone paddock in a year of average rainfall (125 to 200 mm). This paddock is about 25 square kilometres in area and has one permanent stock watering point. It carries about 400 sheep or 80 cattle. Natural vegetation, on which stock are entirely dependent, can range from dense woodland to gibber covered plains almost devoid of any vegetation whatever. A pastoral property has five to fifty such paddocks.

Paddock vegetation in a normal year

Our typical paddock has a sparse tree and tall shrub cover of Mulgas *(Acacia aneura)* or Western Myall *(A. sowdenii)* and various shrubs of *Acacia, Eremophila, Dodonaea,* or *Cassia* species. More abundant and important for stock are stands of perennial shrubs, the saltbushes (*Atriplex* spp.) and bluebushes (*Maireana* spp., formerly *Kochia*). This shrubland gives way to perennial grasses on some soils, for example to woolly-butt *(Eragrostis eriopoda)* on sandy soils, and mitchell grasses (*Astrebla* spp.) on heavy clays. Finally, our typical paddock in an average year has a scattering of ephemeral (annual) plants or their dried up remains — grasses which appeared after a thunderstorm a few months ago, and young plants of everlasting daisies which germinated after some recent light rain.

The stock in our paddock prefer the succulent ephemerals and have grazed these off for a considerable distance from the watering point. In years past they have also taken a heavy toll of the saltbush and bluebush, the damage being caused by high stock numbers during protracted dry periods when no ephemeral forage was available. Most of this obvious damage is confined within three kilometres or so of the watering point. The whole paddock, however, contains little if any regeneration of the bushes or the palatable shrub and tree species. This is due, at least in part, to a highly fluctuating but significant rabbit population.

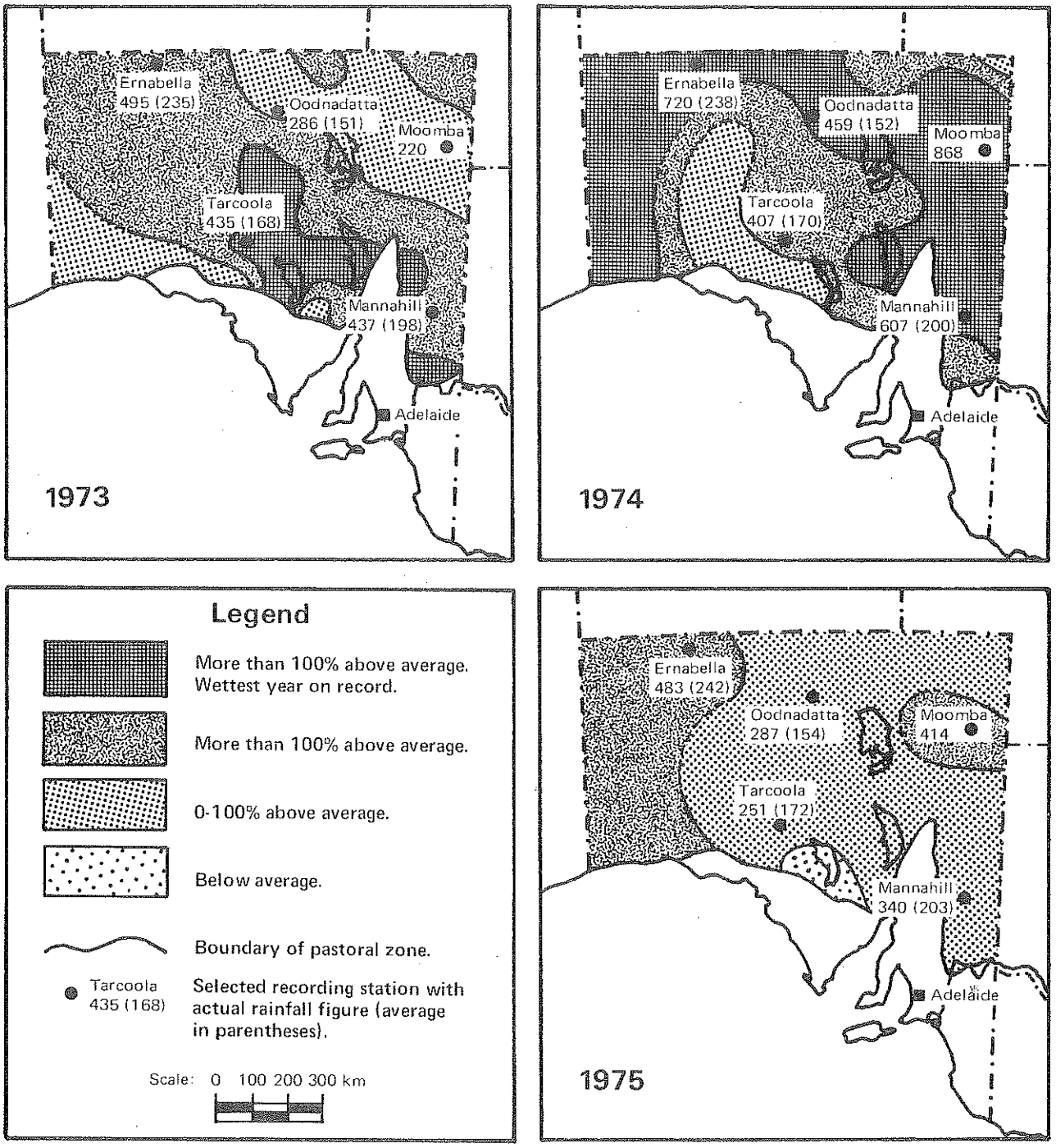
...then after the rains

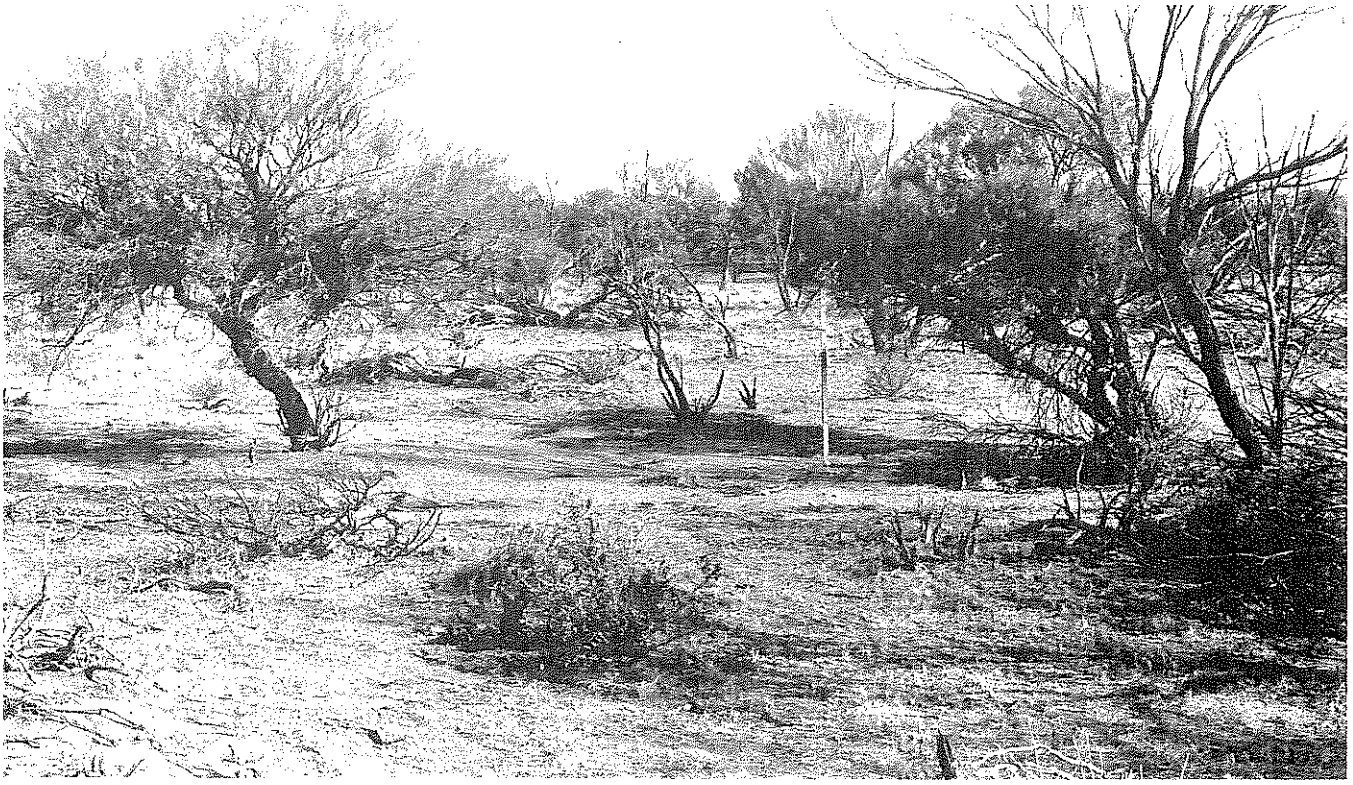
One of the most important effects of good rains in the pastoral zone is the subsequent ephemeral plant growth which relieves the grazing pressure on the perennial forage plants. This enables the perennials to recover, make new growth, flower and fruit. An extended series of good rains unaccompanied by a corresponding increase in stock numbers results in the perennials setting seed abundantly. If conditions are favourable, this seed will germinate and the young plants become established.

That is the theory of it, anyway. It is common knowledge, however, that despite good rains in the past, one or more factors have prevented many important forage plants from regenerating and becoming established in any quantity. If such regeneration is ever to be successful, then surely after the recent good rains, now is the most likely time. The following is a summary of the data to hand at the moment and the current situation.

The ephemerals have shown the most dramatic response to the three to four years of above

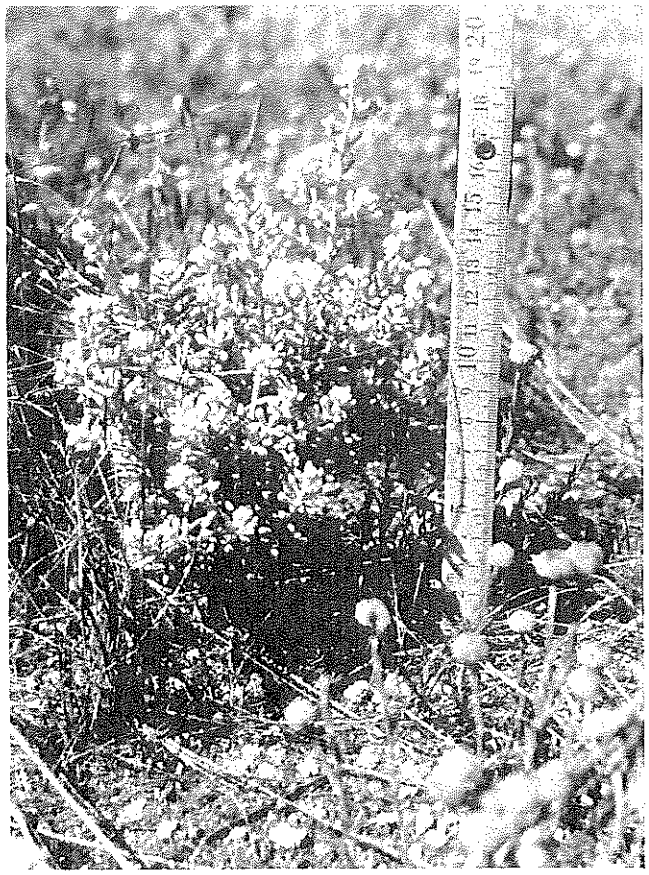
Map 1: Rainfall in the pastoral zone, 1973-75. The different categories show the degree of departure from the mean annual rainfall.



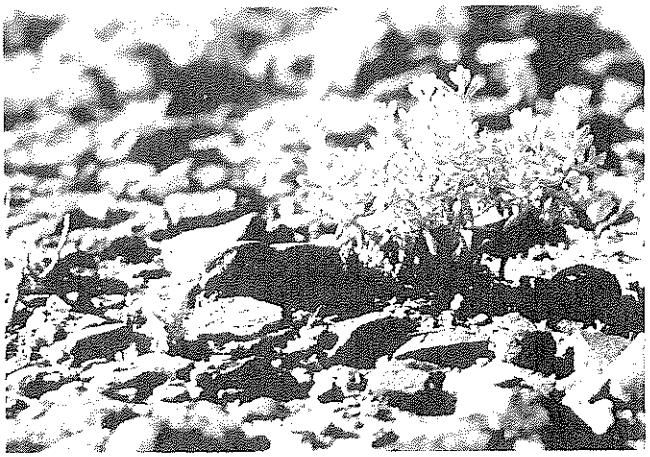


An arid woodland south of Coober Pedy in a typical year (1971). *Eremophila* bushes are in the foreground.

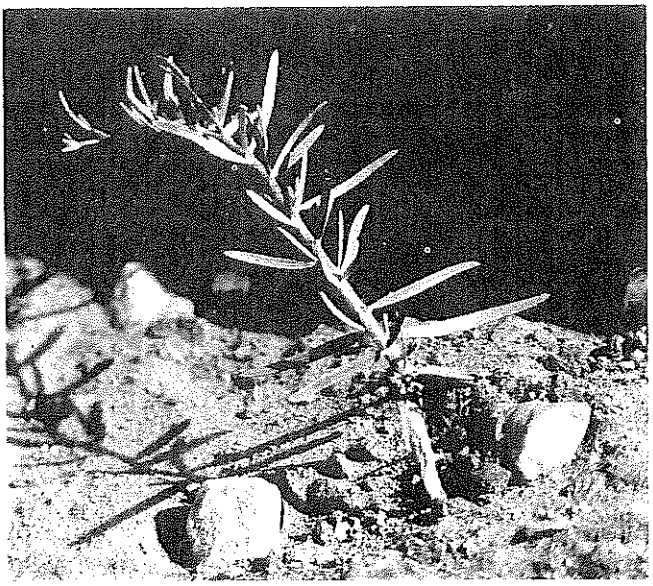
The same view as the above photograph, but after the rains (1974): ephemeral grasses in abundance and several firebushes have appeared.



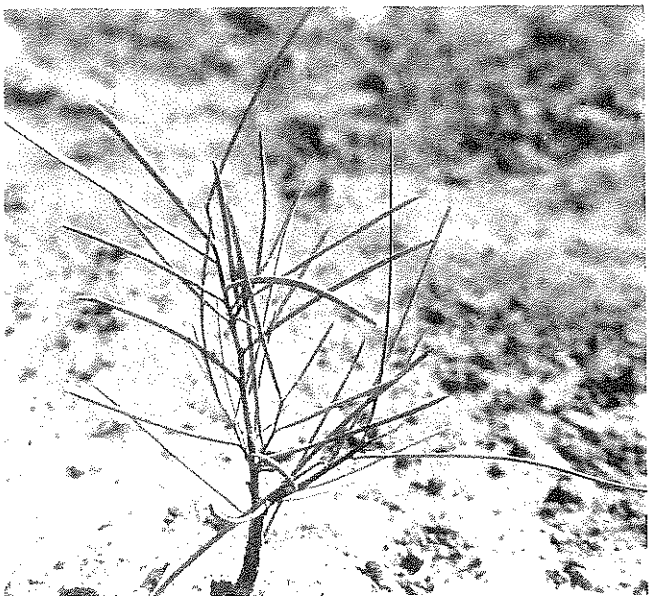
A 20 cm high bluebush — about 12 months old.



A 10 cm high low bluebush *(Maireana astrotricha)* — about eight months old.



A 15 cm high mulga — about 12 months old — which germinated two months after a fire.



A 20 cm high western myall — about 12 months old.

average rainfall, but the time of the year in which rain fell determined which species proliferated. After rain in the cooler months, the most abundant species were speargrass *(Stipa nitida),* mulla mulla *(Ptilotus gaudichaudii)* various types of bindyi (*Bassia* spp.) and a variety of everlastings. Summer rains produced a cover of button grass *(Dactyloctenium radulans)* and verbine *(Psoralea cinerea)* on heavy soils, and kerosene grass *(Aristida contorta)* and *Enneapogon* spp. on the sandier soils. Even the normally bare dune crests in the Simpson Desert were covered by yellow flowering shrubs of *Crotalaria* spp. and the poached egg daisy *(Myriocephalus stuartii).*

Of far greater significance (in the long term) than this dramatic growth of short-lived plants has been the extensive regeneration in some areas of the key perennial drought fodder plants. Extensive regeneration of the following species has been observed: bluebush *(Maireana sedifolia),* northern bluebush *(Chenopodium auricomum),* old man saltbush *(Atriplex nummularia),* mitchell grass *(Astrebla lappacea),* and neverfail *(Eragrostis setifolia).* Tree species regenerating freely include the coolabah *(Eucalyptus microtheca),* mulga *(Acacia aneura)* and western myall *(A. sowdenii).* The last two species have regenerated most extensively in areas burnt out in 1974-75 (see last issue of the Journal).

A 30 cm high bullock bush *(Heterodendrum oleaefolium)* — about six months old — growing from the root of an established plant.

Other less valuable perennials have regenerated spectacularly in some areas. These are the cassias (*Cassia* spp.), sandhill wattle *(Acacia ligulata)* and the so-called firebush *(Maireana erioclada).*

Now...what of the future?

The regenerating pasture plants described above have one thing in common: even the most vigorous will need several more years of protection from heavy grazing before they are either well established or beyond grazing height. Obviously, the good seasons are unlikely to last much longer, and it would be sound grazing management to protect the best areas of such regeneration from heavy grazing pressure.

The rabbit problem is already severe in some areas, and is likely to become critical when dry seasons return. Rabbits have bred profusely in recent years owing to the abundance of feed and decreasing virulence of myxomatosis. Rabbits will extensively damage perennials by ringbarking and grazing unless their numbers are controlled.

The department is monitoring the regeneration in various parts of the State to discover which factors affect the survival and establishment of the young plants. The photographs included here are intended as a guide for field identification of young plants of some important forage species.

Right now, largely because of depressed cattle prices, there are many areas where stock numbers are far higher than can safely be carried in a normal year. A reserve of ephemeral growth is still available, but the crunch will surely come if the market situation does not improve before normal seasons return.

The rains, subsequent flooding, and regeneration now taking place in the outback are a once-in-a-lifetime event. It behoves all of us with an interest in the welfare of the pastoral zone to see that this regeneration is not destroyed in years to come.

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