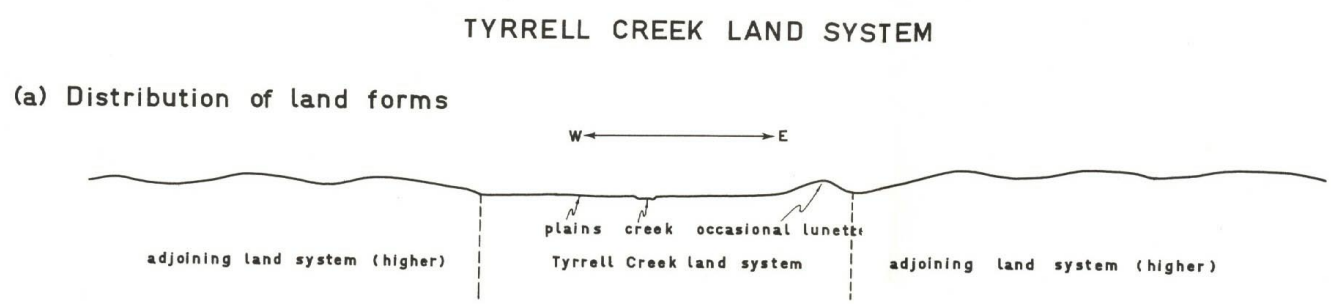
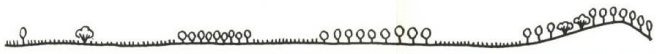
Tyrrell Creek Land System

Fig. 22 – Tyrrell Creek Land System



(b) Land system diagram

AVERAGE ANNUAL RAINFALL: Varies from 12"–14"; decreases from S to N along each creek
LAND USE: Mainly grazing of native vegetation



LAND FORM	Type	Plain				Lunette
	Approx. percentage of land system	95				5
	Approx. cross-section	1 chain–10 miles				50 yards–½ mile
PARENT MATERIAL		Parna (with saltation material at surface ?)	Parna or clay alluvium	Coarse saltation material or coarse alluvium overlying parna or clay alluvium		Parna (with saltation material at surface ?)
NATIVE VEGETATION		Grassland and savannah	Grassland Woodland of black box and less redgum			Variable
SOIL	Textural group	Sandy loams	Heavy clays	Sandy loams	Sands	Sandy loams
	Morphological group	Group C	Grey heavy clays	Brown sandy loams with grey clay subsoils	Grey sands with with grey clay at variable depth	Group C
	Proportion on land form	Codominant	Codominant	Minor	Codominant (confined to Outlet Creek System)	Dominant
	Moisture characteristics	Moderate to poor	Very poor	Moderate	Good	Moderate to poor
	Fertility reserves	Moderate	High	Moderate	Moderate to low	Moderate
LAND USE	Most suitable form	Cropping and grazing	Grazing	Cropping and grazing	Grazing	Cropping and grazing
	Nutrients required in fertilizers	P				P
	Recommended pastures	Barrel medic Wimmera ryegrass Native grasses	Native grasses	Barrel medic Wimmera ryegrass Native grasses	Native grasses	Barrel medic Wimmera ryegrass
	Land use class	2 (*a*)	3	2 (*a*)	3	2 (*b*)
WIND EROSION HAZARD		Moderate	Slight		Moderate to severe	Severe scalding followed by severe water erosion
OTHER HAZARDS		Flooding				

Because of the low and somewhat evenly-distributed rainfall and the porous, nature of the soils on rising ground, streams do not rise in north-western Victoria. However, four creeks enter the region from higher-rainfall country in the south. They flow only in wet years and owing to seepage and evaporation the waters penetrate only as far as the central parts of the region. Tyrrell Creek discharges into Lake Tyrrell, Lalbert Creek into Lake Timboram, and Yarriambiack Creek into a series of lakes to the north of Hopetoun. In the wettest of years Outlet Creek overflows from Lake Albacutya but it rarely penetrates as far as Lake Agnes. The low-lying country bordering the creeks and occasional associated lunettes form the Tyrrell Creek land system, the aggregate area of which is approximately 450 square miles (Fig. 22). A tongue of low-lying country around Birchip has been included. It is a northerly extension of the Avon River but receives flood waters only rarely. Isolated occurrences of the land system to the north of the creeks indicate that the streams have penetrated further to the north in the past and that their courses have been blocked by aeolian deposits.

The native vegetation on the plains is quite distinct from that on the rising country through which the creeks flow consisting largely of black box woodland (Plate 26) and grassland, with smaller areas of redgum woodland in the moister sites. The distribution of these communities is influenced by the drainage pattern of the floodwaters rather than by the soils. The woodlands fringe the creeks, and lakes whilst grasslands predominate on the broader plains. The native vegetation on the lunettes is similar to that in the surrounding land systems. Although largely cleared, pine and buloke woodlands appear to have predominated with smaller areas of mallee.

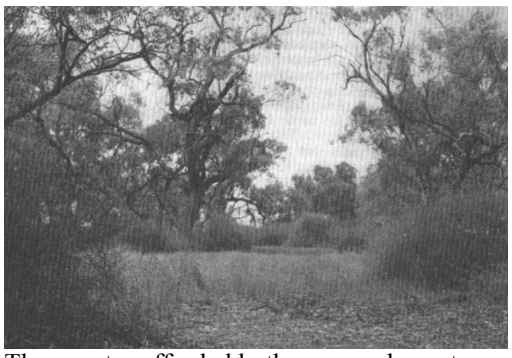


Plate 26 – Lignum scrub and black box woodland in the Tyrrell Creek and system near Culgoa.

The country afforded both grass and a water supply so that it was taken up for grazing as early as the 1840's, some 50 to 60 years before general settlement occurred. Grazing of the native vegetation is still the main form of land use because of the predominance of soils which are too heavy for cropping in the semi-arid climate. In addition most of the country along Outlet Creek is Crown land and on the portions which are leased, only grazing is allowed. The average annual rainfall decreases along each creek from about 14 inches in the south to between 12 and 13 inches in the north.

The most widespread soils are grey heavy clays which usually occupy the more frequently flooded creek beds. They also cover broad areas on lake beds. Because of their unfavourable moisture characteristics these soils are not suitable for cropping and introduced pastures and the native vegetation provides relatively little feed. The surface of the ground is frequently bare. In occasional years it may be possible to obtain a heavy cereal crop by sowing soon after a flood recedes.

At slightly higher levels the grey clay is sometimes overlain by a deposit of brown material which is usually of loam texture. These soils are confined to the Tyrrell Creek land system and they are most widespread on the relatively broad flood plains along the northern reaches of the Tyrrell and Lalbert Creeks. The brown deposit is of variable depth, but generally less than 12 inches. Because of their lighter surfaces the soils are more suitable for plant growth than the heavy clays and their productivity improves as the loam deposit becomes thicker. The native vegetation is mainly grassland which remains in places to produce good low-cost feed. The soils are also cropped and sown to introduced pastures. Their erosion hazard is slight.

Along Outlet Creek the grey clays are frequently overlain by grey sands which vary in thickness from a few inches to several feet. These grey sands occur on several grassland plains which are found most widely on the Pine Plains grazing lease. This is an area of great natural beauty in which grasslands alternate with woodlands of black box and redgum. About 17 square miles or one quarter of the plains consist of the combination of grasslands and grey sands. These grasslands provide low-cost feed and although the sands are susceptible to wind erosion, stability has been well maintained, except around occasional water-supply tanks. Local interest has been shown in subdivision for cropping and grazing. Although crops and introduced pastures can be produced on the grey sands this form of land use is not as stable as light grazing of the native perennial grasses. The grey sands are initially fertile but it is likely that they would not stand intensive cropping as well as the heavier soils of the Tempy land system to the east. In addition, if subdivision were contemplated preliminary investigations would be needed to determine whether a satisfactory water supply could be obtained and whether cultivation should take precedence over retaining the area as a parkland.

Portion of the plains within the Tyrrell Creek land system are above present flood levels. The soils on these sites are mainly sandy loams of Group C whilst the predominant native vegetation is grassland. This type of plain is most widespread in the Birchip area which has been grazed for some 120 years.

Plate 27 – Wind scalding of a sandy loam of Group C on a plain south of Birchip in the Tyrrell Creek land system. ***Ironstone is scattered on the surface of the exposed clay. The vegetation is grassland and buloke savannah woodland.***

Although the erosion hazard is only moderate, overgrazing, particularly during periods of drought, has resulted in widespread scalding (Plate 27). The land is so badly eroded that it is frequently difficult to find remnants of the sandy loam A horizons. Relatively small amounts of drift remain and at first sight it appears that the exposed clay horizon is in fact the original surface.

Although the scalds are chemically fertile, reclamation is particularly difficult because of the poor moisture characteristics of the clays. In addition, there is the problem of dry land salting which leads to the development of a surface seal which hinders the penetration of rain. The soils can be easily cultivated except when wet and a good tilth can be obtained owing to the strong angular blocky structure of the clay. However, with subsequent rains the surface seat re-develops and full reclamation cannot be achieved until the salt is confined to the subsoils by increasing transpiration at the expense of evaporation.

A pilot reclamation trial involving species[*] and manurial plots was laid out in the autumn of 1955 near Watchem, 12 miles to the south of Birchip, (Gibbons and Rowan, unpublished data). Rainfall in that year was most favourable. The most successful species was Wimmera ryegrass which developed a dense sward. Cereal rye and wheat also grew well. There was a marked response to superphosphate at the rate of 60 lb. per acre. Gypsum at 2 tons per acre was also tested to determine whether the replacement of sodium ions by calcium ions would reduce the re-development of the surface seal. The gypsum treated plots did maintain a more open surface but the increased growth was too slight to justify the high cost of applying gypsum on a farm scale. In the year following their establishment the plots received no further treatment. Wimmera ryegrass was the only species to have germinated satisfactorily. However, it produced only a small fraction of the growth of the previous year.

The Soil Conservation Authority has conducted reclamation trials on a field scale for several years on the same type of scalded country in a similar rainfall belt (14 inches per annum) at Mystic Park, 16 miles to the south-east of Swan Hill. Again, Wimmera ryegrass has been the outstanding species and it has been shown that autumn cultivation improves its subsequent vigour. However, because of the heavy soil texture, growth has been uneconomical in those years in which rainfall during the growing period is less than average. In addition, access for cultivation may be difficult during wet autumns. Where Wimmera ryegrass has been grown for several years and where a cover has been maintained at all times by wise grazing management the surface seal has been greatly weakened, indicating that the surface salinity has been reduced. Soil samples are required to determine the extent to which this has occurred.

Another approach to the reclamation of the scalded country is to establish perennials. In the Mystic Park area bladder saltbush has volunteered on land on which Wimmera ryegrass has been grown. On a property to the south of Birchip light stocking rates were used[*] during a run of good seasons in the 1950's and this enabled the development of a sward of spear grass and wallaby grass which were the original dominant species. Experiments are required to determine the most satisfactory techniques for establishing native perennial halophytes and grasses. By comparison with Wimmera ryegrass these species can be managed more easily and with less cost because autumn cultivations are not required for re-establishment. In addition the perennials will transpire following rains during the summer as well as during the cooler months so that the surface salt contents can be reduced more effectively.

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[*] Species tested were Wimmera ryegrass, barrel medic, Dwalganup, subterranean clover, cluster clover (*T. glomeratum*), trefoil (*M. denticulata*), phalaris (*P. tuberosa*), bladder saltbush (*Atriplex vesicarium*), lucerne, wheat and cereal rye. Of the legumes cluster clover made the best growth.

[*] Information supplied by the landholder, Mr Sanders.

About 5 per cent of the Tyrrell Creek land system is composed of lunettes which occur in scattered areas, notably near Dattuck, Tiega, Pine Plains, Yaapeet and Hopetoun. Sandy loams of Group C are the most widespread soils on the lunettes. Light clays have been observed near Yaapeet and white deep sands immediately to the east of Lake Albacutya and at Pine Plains. A fourth type of soil which is confined to occasional lunettes in this and the Raak land system consists of yellowish brown sandy loam, which is typically between 12 and t8 inches thick, sharply defined from yellow sandy clay loam or sandy clay.
The lunettes are or have been cropped except where the soils are deep sands. The sandy loams of Group C have been wind scalded to varying degrees, in some instances so severely that cropping is no longer possible. Reclamation measures are similar to those outlined above for the same type of soil on the plains. They must be supplemented on the lunettes, however, by contour banks because wind scalding is followed by water erosion. Some lunettes have been so badly gullied (Plate 2) that the construction of these banks is impracticable.

The lunettes on which the soils are white deep sands are generally protected by the native vegetation which is either mallee or pine and buloke woodland. The occurrence of pine and buloke woodlands on these situations shows that this type of vegetation is not always an indicator of fertile soils. Where the timber has been removed, drift is severe and reclamation is difficult because of low soil fertility combined with exposure to winds. The method of reclamation most likely to succeed is to sow cereal rye and lucerne with a mixed nitrogenous and phosphatic fertiliser. Copper and zinc. may also be required because of the proximity and similarity of the soils to those in the Big Desert where responses to these trace elements have been found. The sown area would need to be fenced to exclude rabbits.

The yellow sandy loams show even more severe problems of wind and water erosion, and in general they are no longer suitable for cropping. By contrast the light clays are only slightly affected and they can be readily stabilized by contour banking and by protecting fallows with rough and stubble-covered surfaces.

Where the Outlet. Creek runs through the Wyperfeld National Park the grasslands and woodlands associated with the creek add beauty and variety to the reservation which is otherwise covered by mallee, scrub mallee and heath.