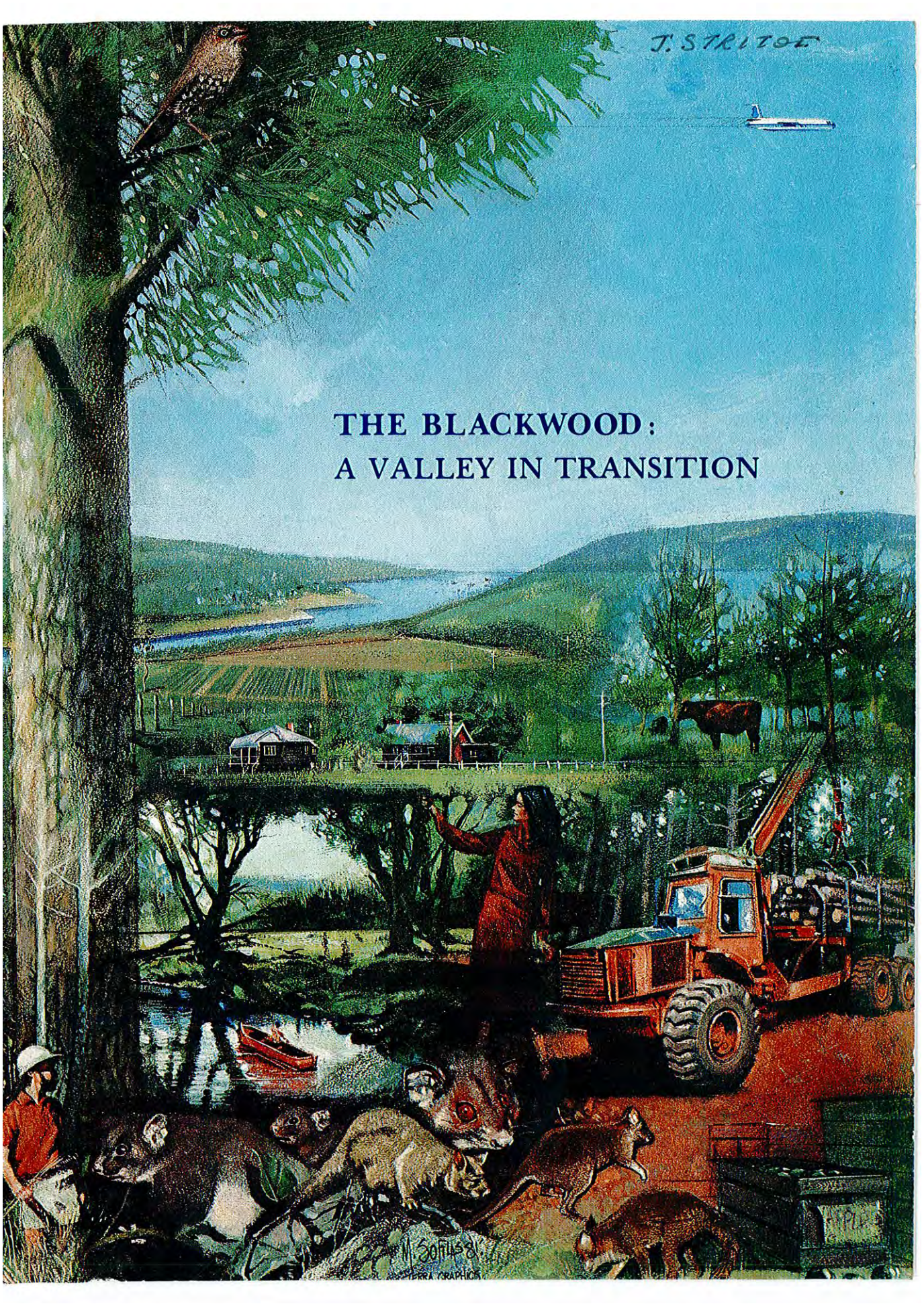
THE BLACKWOOD:
A VALLEY IN TRANSITION

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SPECIAL FOCUS No. 2

THE BLACKWOOD:
A VALLEY IN TRANSITION

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Forests Department of Western Australia
Perth, 1981

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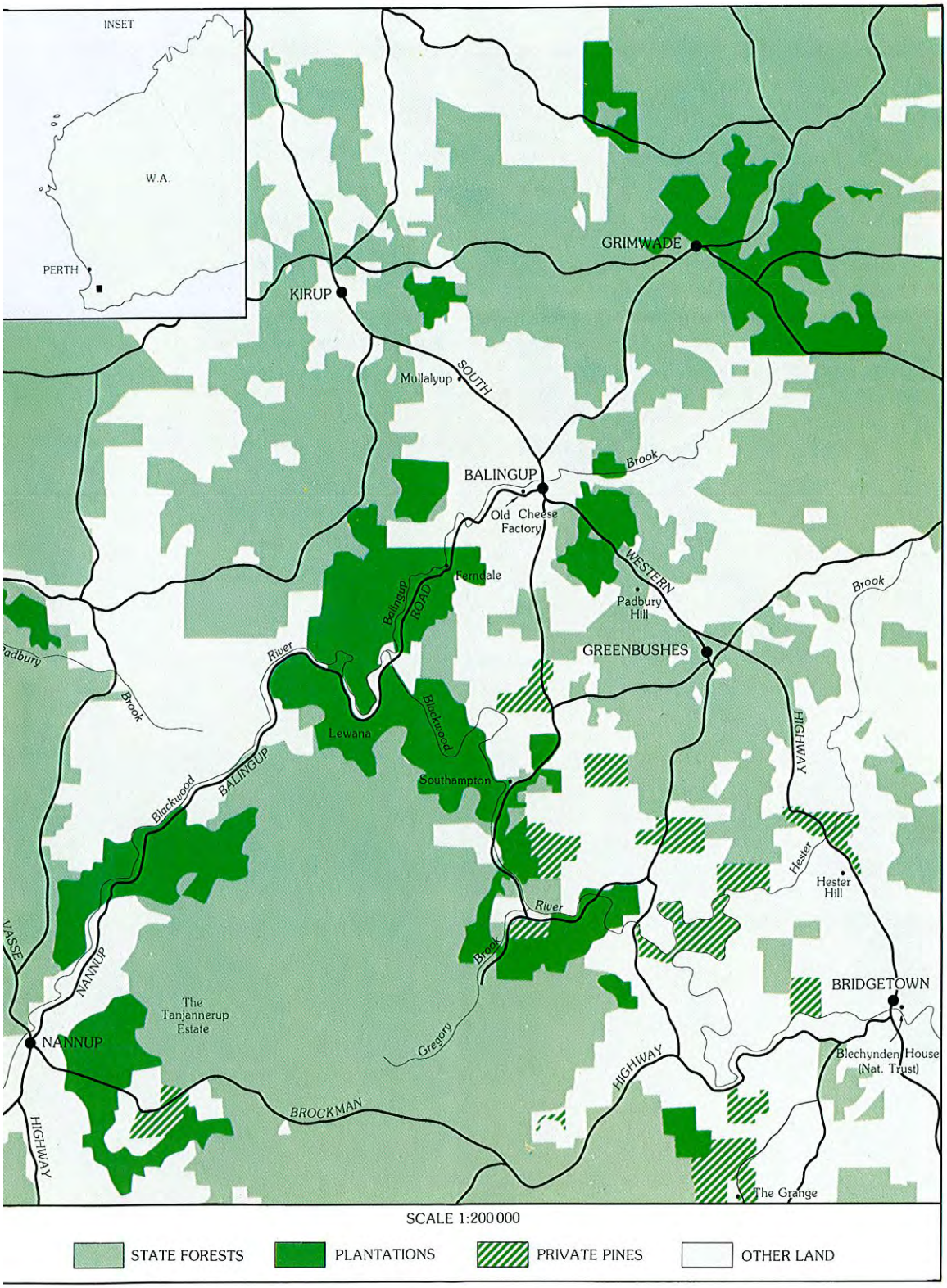
Prologue

The Blackwood River is the longest river in the south-west of Western Australia. Its headwaters originate in the flat fertile country of the wheat belt, and its waters meander west until they reach the southern extension of the Darling Scarp. Here its character changes: broad deep valleys flank its banks, the landscape becoming hilly and at times precipitous. Further west along its course, the river leaves the hilly country and traverses the broad openly forested coastal plain, finally widening into an estuary at Augusta.

Much has happened along the Blackwood River in the past 150 years since the colonisation of Western Australia. Agriculture, forestry and mining have, to varying degrees, left their mark on the river and its environs.

This booklet sketches the changes over two centuries to both the landscape and inhabitants of the Blackwood Valley, the area where the Blackwood meets the Darling Scarp. This region encompasses much of the countryside situated in the triangle formed by the communities of Balingup, Bridgetown and Nannup. This is the area of some of the most spectacular landscape along the river. High hills covered in a mosaic of grasslands, eucalypt forest and pine plantation contrast markedly with the rest of the Blackwood environs and give this region its unique character.

Throughout this account of the Blackwood, the underlying theme is on change—change to the Valley landscape, its human inhabitants, its flora and fauna. Change is continually occurring in all environments, whether natural or man-made, as new replaces old.

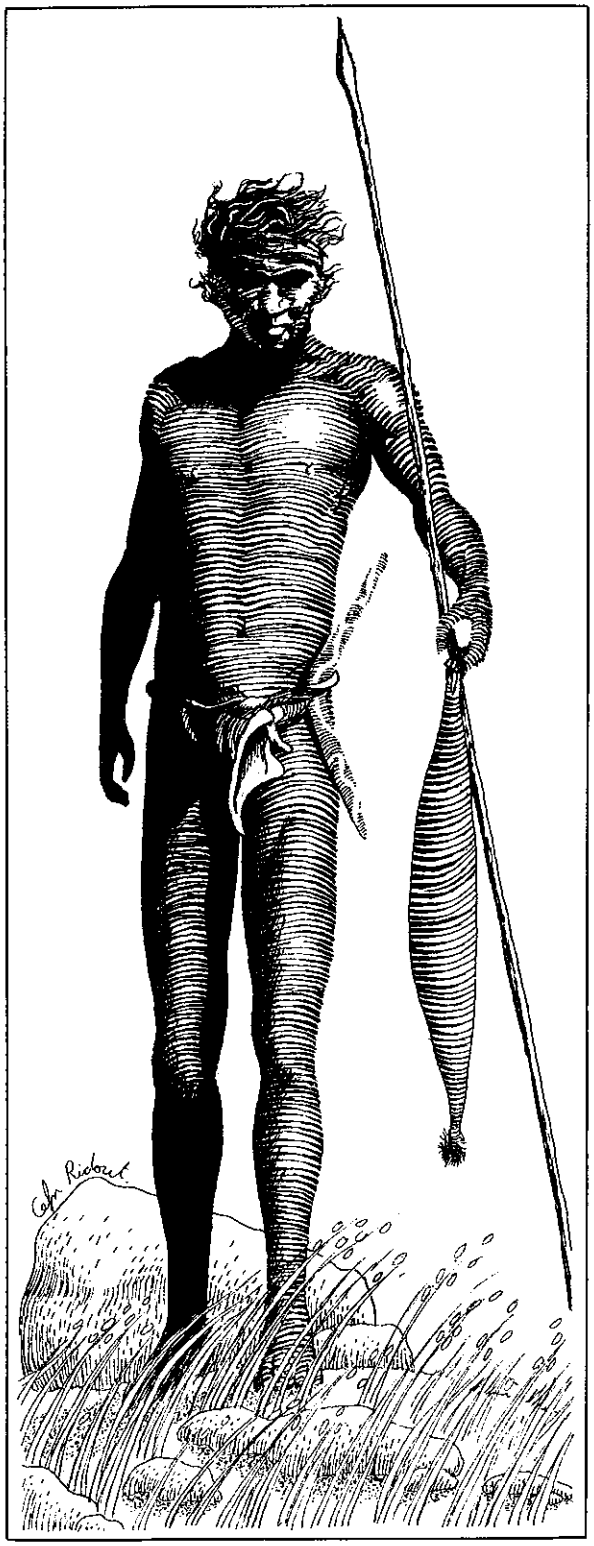

INSET
W.A.
PERTH
GRIMWADE
KIRUP
Mullalyup
SOUTH
BALINGUP
Brook
Old Cheese Factory
Ferndale
Balingup
ROAD
WESTERN
Padbury Hill
Brook
River
GREENBUSHES
Brook
Lewana
Blackwood
Southampton
HIGHWAY
Blackwood
BALINGUP
Hester
Hester Hill
River
Brook
NANNUP
The Tanjannerup Estate
BRIDGETOWN
Gregory
Blechynden House (Nat. Trust)
NANNUP
HIGHWAY
BROCKMAN
HIGHWAY
The Grange
SCALE 1:200 000
STATE FORESTS
PLANTATIONS
PRIVATE PINES
OTHER LAND

Before European Settlement

Prior to European settlement, the Blackwood Valley was covered with forest. Magnificent stands of jarrah and blackbutt grew on the rich red soils of the river flats and on the slopes of the hills. From a vantage point an observer might have perceived an enveloping blanket of tall forest broken only occasionally by an outcrop of granite or a patch of scrubby jarrah on the shallow soils near the hilltops. Early descriptions of the countryside suggest that the forest understorey of low woody shrubs, zamias, blackboys and small banksias was open, similar to remaining pockets of jarrah forest in the Valley today. In contrast, the moister sites along the river and its many tributaries supported dense thickets of ti-tree and rushes.

Museum records are incomplete but confirm the presence of the quokka, brush-tailed possum, short-nosed bandicoot, phascogale and the dunnart in the area. The ringtail possum, native cat, brush wallaby, water rat and southern brush rat have also been collected nearby. The grey kangaroo was common in the area and many species of bats were probably also present. However, species such as the numbat and the woylie or rat-tailed kangaroo, which were present further to the east and also on the coastal plain to the west, may not have been common in this section of the Valley.

Records of reptiles and frogs are even sketchier, but again this region is unlikely to have had a wide range of either group. Bobtail goannas, racehorse goannas and carpet snakes are known to have occurred in the area. The highest diversity of skinks and snakes however, is to be found on the sandy soils of the forest margins, the west coastal shrublands, and the woodlands of the eastern forest fringe. A diversity of frogs is likely to have been present though their real stronghold is in the cooler, wetter forests further south.



The jarrah forest, at least from Harvey southwards, and the karri forests of the deep south were little used by aborigines. They occupied the west coast and its hinterland and the more fertile low rainfall game-rich areas to the east of the main forest belt. However, there is evidence that they used the forested regions where they were penetrated by major rivers such as the Blackwood. Wandering tribes journeyed through the Valley, perhaps visiting from the coastal lowlands or on their way upriver to the richer grasslands and open woodlands nearer the headwaters of the Blackwood.

So that new herbage attracted large game animals, aborigines of the south-west used low intensity burning. Known as "firestick farming", this method was also used to drive smaller game, such as bandicoots, from thick cover. Firestick farming, was an integral part of the aboriginal life-style further down river, and although evidence is scarce, it may also have been carried out in the Valley at times. The open nature of the understorey and the fact that transport canoes were generally not used in the south-west at that time suggest that firing occurred for access as well as hunting.

It appears then, that from very early times man played a part in manipulating the forest environment to satisfy his needs. This environmental manipulation was to increase dramatically with the arrival of the first European settlers.

Virgin forests of giant trees clothed much of the Valley.

European Arrival and Exploration

Although large portions of the Western Australian coastline had been explored and charted by a progression of Dutch, French and British navigators during the seventeenth, eighteenth and nineteenth centuries, very little was known of the mainland itself, neither its landscape nor inhabitants. This was to change rapidly, however, with the establishment of British settlements in the late 1820s at King George Sound, on the Swan River and at Augusta. It was not long before these early settlers began seeking out more arable farming and grazing lands, and stock routes.

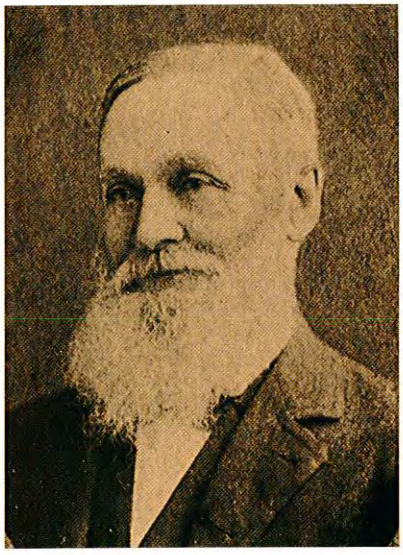
The settlement at Augusta was situated at the mouth of the Blackwood. Not surprisingly, the earliest recorded exploration of the river valley began from this settlement. In 1834, a small party of men led by Thomas Turner, set out from Augusta with the intention of tracing the Blackwood upstream to its source. As far as is known, they explored only the river as far as the present community of Nannup before turning back.

Eight years later, in 1842, three explorers named Bland, Irwin and Singleton, set out from King George Sound to walk cross-country to a new settlement, now Busselton, situated at the mouth of the Vasse River. Written accounts of their journey, which took them through the Blackwood Valley, tell of meeting aborigines near where the town of Bridgetown now stands. Soon after their arrival at the Vasse, a group of eleven men led by Scholl, Warburton and Bussell set out to retrace their route back to King George Sound. Apparently, the steep terrain of the region surrounding Balingup and Bridgetown posed a barrier to these early explorers, one account referring to the party's hopes of finding a route "through the mountains".

In 1845, a party headed by surveyor Augustus Gregory set out from the upper reaches of the Blackwood to explore the river downstream towards the coast. Gregory, who later was to carry out the first land surveys of the Blackwood Valley region, described the region situated between the Blackwood and the upper branches of the Preston River as a well timbered landscape supporting stands of jarrah, then known as "Swan River Mahogany", blue gum and scrubby thickets atop hills of gneiss on ironstone. Gregory also spoke of the region as having valleys containing some patches of arable land and good pasture for cattle.

During the next few years, other explorers, including Surveyor-General Roe, were to journey into the Blackwood Valley. From the collective accounts of their travels, a description of the district's landscape and its apparent potential for agricultural development began to emerge. The first settlers were soon to follow.

Augustus Charles Gregory carried out the first land surveys of the Blackwood Valley region in 1852.
(Courtesy of the Royal Western Australian Historical Society)



Sailing ships brought the settlers and transported Swan River mahogany (jarrah) to the "old country".

Early Settlers

The 1850s were marked by the arrival of the first convicts to the young colony in the west along with an inflow of British revenue to help pay for their upkeep. As the coastal settlements grew, so did their need for meat, grain and other commodities. Whilst grain and flour could be obtained by sea from South Australia, mutton and beef had to be raised locally.

With the arable settled regions along the coast no longer able to satisfy this growing demand for food, settlers turned their attention inland. It was soon found that while some areas to the east of the Darling Range contained good pasture land, much of the countryside was unsuited to grazing because of the widespread distribution of plants of the genus *Gastrolobium*. Poisonous to stock, these plants were responsible for the death of large numbers of sheep and cattle, which caused many settlers to search for land free from poison. Two of these settlers made their way to the Valley (around 1857) and, finding it free of poisonous plants, settled there. Which of the settlers came first it is difficult to say, for they came from different directions, and although they settled only a few miles apart, months passed before they were aware of each other's existence.

John Blechynden, a twenty-one-year-old youth, came from the east along the Blackwood River. Guided by friendly natives who knew of the poison-free valley, the party lived off the land, shooting and eating kangaroos and brush-tailed possum. Once, for a change, they shot a duck to eat but it was so tough and scrawny that they returned to their previous diet.

Blechynden took up a pastoral lease of 4 000 hectares and built his homestead where Bridgetown now stands, close to the Blackwood River.

Edward B. Hester came from the north, also guided by friendly aborigines. He drove his sheep south from Bunbury and settled on the banks of a brook just north of the Blackwood River at a location now known as Hester's Hill. Here he took up an area of approximately 25 000 hectares stretching from the present locality of Greenbushes south towards Bridgetown.

Others interested in pasturing sheep for meat followed closely behind Hester and Blechynden. John Allnutt settled at Nelson Grange south of the river; James G. Lee Steere chose large areas to the east of Blechynden, while Walter Padbury took up larger leases and freehold land along the Balingup Brook at Ferndale. The Jones brothers were attracted to Southampton on the Blackwood, west of Chester.

Further down the Blackwood at Nannup, settlement was also under way. Hawkins, Ramsay, McCount, Bussell, Eidle, Earnshaw, Bell, Fennel, Forrest, Bunbury, Reynolds and Buerin were some of the settlers who took up land, mainly to the west of the Valley. Most settlers purchased the small freehold lots on which they built their houses and leased large acreages of forest to graze their stock. The forest yielded magnificent jarrah trees that were straight-grained and easy to split, but clearing was a difficult and time-consuming task. At first only small areas could be cleared and these were used mainly for growing vegetables, fruit and grain. To protect their crops, settlers erected post and rail fences with boarding on the lower rungs to prevent small animals slipping between or beneath the rails. Sheep and cattle were left free to roam and graze in the adjoining forest areas under the watchful eye of the shepherds. It is told that on some runs, sheep were used to fence in stock. Shepherds would drove grazing sheep slowly around the perimeter of a grassed circle. Cattle would be released within the run and, not liking to graze areas that sheep had been through, would not move over the perimeter.

Aborigines of the south-west in the 1860s. The traditional skin capes as worn by the man on the right were already being out-moded by European clothing.
(Courtesy of the Library Board of W.A.)

Three well-known early settlers in the Blackwood and Warren districts towards the end of the nineteenth century: John Allnutt (left), Thomas Muir (centre), and Joseph Smith.
(Courtesy of the Library Board of W.A.)

Dingoes did not pose a major threat to stock. Few farmers are recorded as sighting dingoes, although one farmer, Edward Lee Steere, son of James Lee Steere, was finding sheep on his property that had been attacked. Sometimes the sheep were still alive, though parts of their stomach had been ripped open and eaten. Although people trapped for the dingo they couldn't catch it and the killing and wounding of sheep continued.

Lee Steere then called in a man named Jack Dodd, not a local man, who told Edward that it was a three-legged dingo and that he would come back again to trap it when the brooks were running. As soon as the water flooded the brooks Dodd came back and set his traps on the flooded banks, along the dingo's old pad tracks. The traps caught a three-legged dingo bitch and no more sheep were injured.

An insight into the early days of settlement is provided by John Allnutt's diary. John Allnutt, his wife and family arrived at Nelson Grange in April, 1865. Much of his time was spent on horseback either rounding up stray horses, hunting or exploring the surrounding countryside. Kangaroos were shot approximately each second day for food during the first months. Clearing started early but Allnutt had problems with ploughing, the plough continually breaking on the rough ground. The Allnutts planted potatoes, wheat, peaches, apples and gooseberries. They husbanded their own pigs and cattle and by September 1865 were slaughtering and salting their own meat from bullocks.

It should perhaps be noted here that the pioneers of the south-west were somewhat different from the frontiersmen of America and the early squatters in the east of Australia. There appeared to be an aura of quietness and respectability in the settlements, and townships that grew up were styled on English villages. Shepherds in the Perth area even wore the blue smocks of their English counterparts.

Early settlers often had servants to help them open up the land. John Allnutt's account of his household at Nelson Grange gives an indication of the strength of this help. The household consisted of:

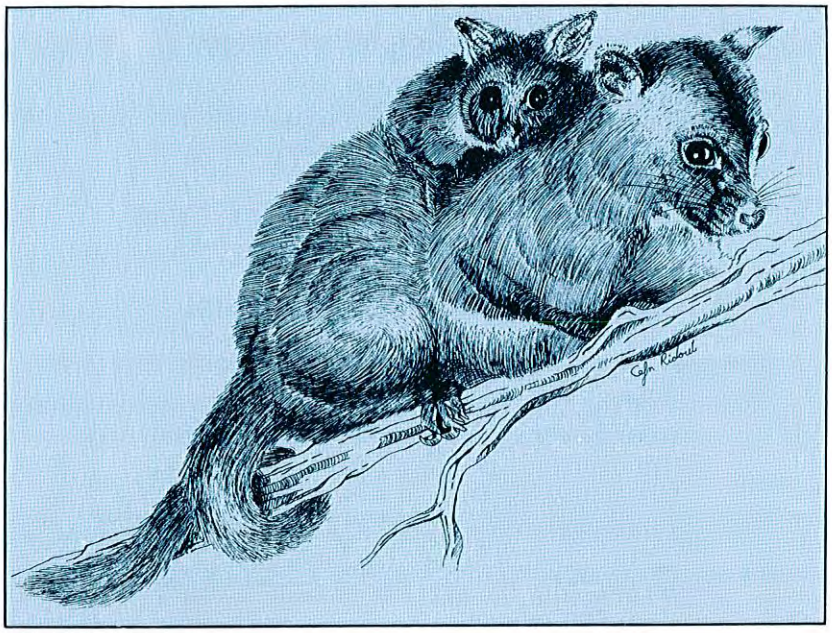
Fourteen white servants—
- 4 monthly men at 50s., 40s., 35s. and 30s. per month
- 1 weekly man, "carpenter", 20s.
- 2 stock keepers 50s. and 30s.
- 1 dairy herdsman 30s.
- 2 sawyers; 1 splitter; wages not stated
- 1 boy and 1 girl (Henry and Rose Mooney) to feed and clothe
- 1 house servant at £15 per year.

Six natives

Five members of the family: John, his wife Kate, Eva, Charles and baby George, then three months old.

Brush-tailed possum, Australian "opossum" was an important commodity in the world's fur markets. Possum "boxing matches" were also organised by the settlers for entertainment.

First Bridgetown Agricultural Show—"Best collection of produce".
(Courtesy of the Bridgetown High School)



By the late 1860s, the settlement had spread along the fertile river and stream valleys, with large pastoral leases fanning out across the hills. The forest itself had not yet shown the effect of the full brunt of European settlement, but the settlers' presence was becoming increasingly evident as the valley floors were cleared for homesteads, orchards and crops.

Grazing, too, was altering the character of the landscape. Allowed to roam throughout the forest, stock would selectively feed upon the more palatable understorey plants. Once these were grazed out, the stock would then eat whatever remained. The zamia palm was a particular menace to the settlers, as it caused rickets in cattle. Frequent burning for pasture encouraged this species to produce fresh green shoots. Forced to either fence their cattle in or eradicate the palms, leaseholders began puncturing the zamia root stock with jarrah spikes.

The native animals were also beginning to feel the impact of European settlement. Kangaroos and possums provided a ready source of food for the early settlers, and possums and water rats were prized for their skins. An old settler, Roy Doust, relates that brush-tailed possum skins (silver-grey) were worth 2s. 6d. a dozen at the turn of the century and the price had risen to 15s. by the early 1930s. Possum skins were sold on world markets as "Australian opossum". A list published in London in 1907 shows that over one million Australian opossum skins were sold on the open market. Only pelts of the North American muskrat, a kind of aquatic rodent, were sold in greater numbers.

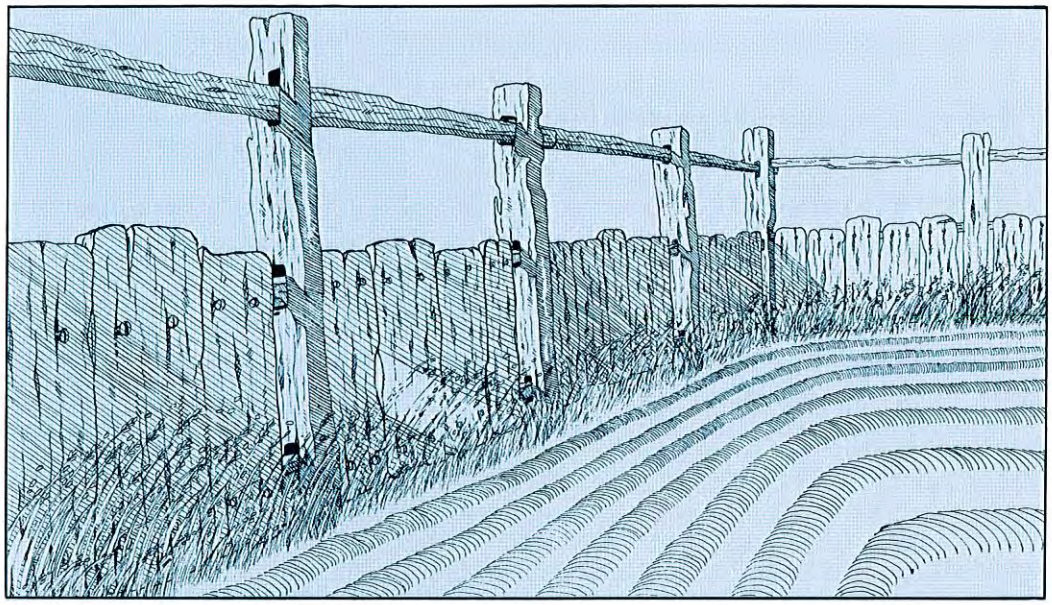
Domestic stock competing with kangaroos and wallabies for food and changing the structure of the vegetation, had inevitable effects on the native animals. Some animals may have been favoured by the change. The native cat and native squirrel (wambenger) would have found domestic hens easy prey, and the early settlers were troubled by them. One settler, Mrs. Wilmott, is alleged to have trapped and killed thirty native cats before being able to establish poultry on her property. Allnutt's fruit was also a ready food source for the possum and parrot.

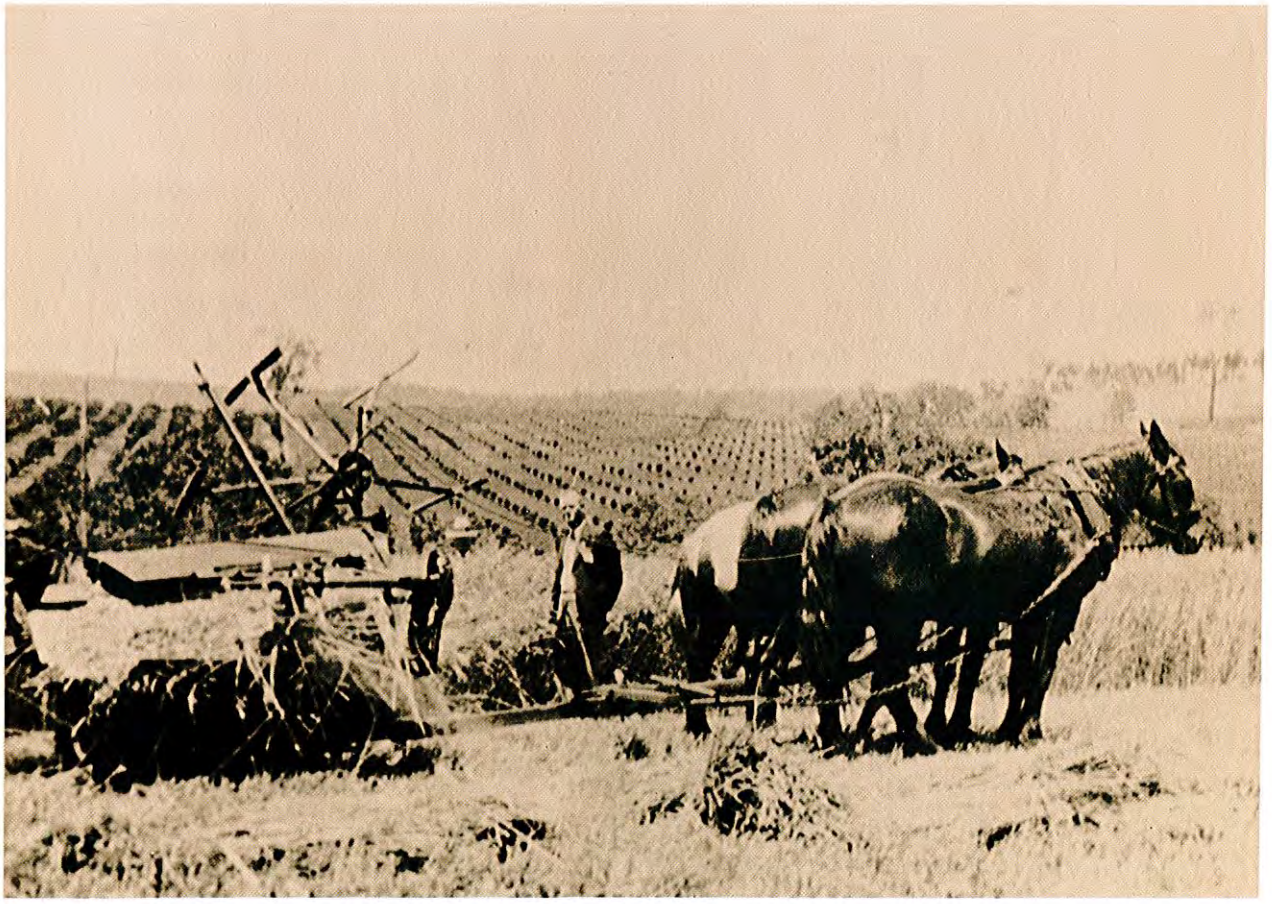
The life-style of the aborigines was also changing. Many of those who had led the Europeans into the Valley soon found themselves and their culture in conflict with the new settlers. But some lived alongside them passively, adopting some of the new settlers' ways. Groups of up to 200 were recorded in the Valley, some individuals working on homesteads, others living nomadic lives like their ancestors.

As they were highly susceptible to the white man's diseases, many succumbed to measles while others died of pneumonia caused from wearing the white man's clothes, wet or dry. Their way of setting the bush alight to encourage young fresh grass and attract game conflicted on occasion with the settlers' practice of grazing sheep on their leases. Their old ways were changing.

Post and rail fences were used to enclose livestock before the advent of fencing wire. The lower rungs were often boarded up to keep small animals out of the vegetable patch.

Horses were used for harvesting in the Valley well into the twentieth century.
(Courtesy of the Bridgetown High School)





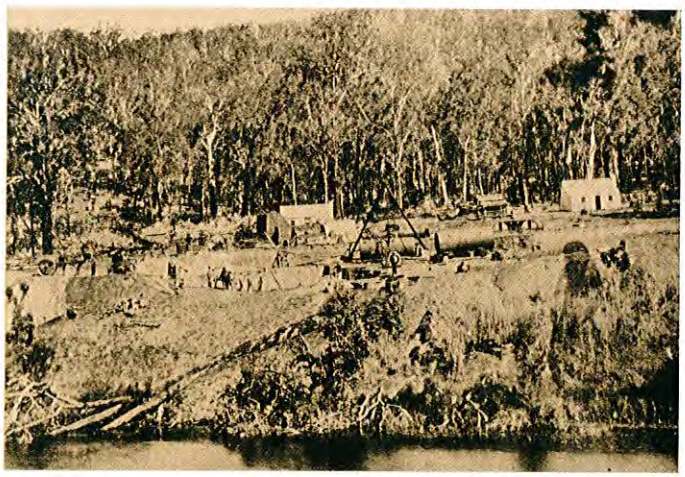
Tin and Timber

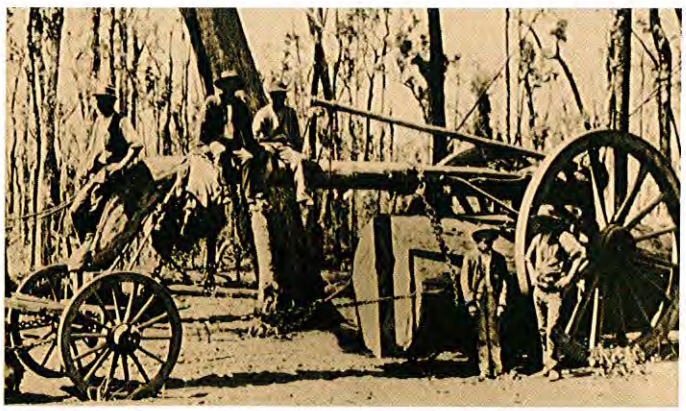
Following the initial settlement of the 1850s and '60s, the district's resident population continued to increase gradually as new settlers took up pastoral leases and began farming the more fertile valley areas. The rate of growth was to increase rapidly towards the end of the century with the discovery of tin near Greenbushes, the development of the sawmilling industry and the coming of the railway.

On 5 July 1888, D. W. Stinton discovered viable quantities of tin close to the waterholes at Greenbushes and subsequently applied for mineral rights on an area of approximately 160 hectares. The overabundance of water during the winter months and the lack of it during the summer hindered mining, but it was not long before a large area was being worked. Early operations were to prove profitable, Stinton making £1 000 in one six-month period.

In 1893 tin prices dropped and this slowed the growth of the industry. However, the slump was short-lived and by 1897 prices began to rise again with the result that mining activity increased substantially. According to a census carried out in 1904, Greenbushes supported "one hundred and fifty-nine miners, nine storekeepers, eight builders, two tin smiths, seven carpenters, solicitors, mining agents, chemists, butchers, tailors, bootmakers, bakers and a blacksmith". By 1913, Greenbushes had become a thriving town with a population of 2 000.

The influx of people to Greenbushes and the surrounding region was associated not only with tin mining. It was also due in part to the budding prosperity of a new industry, sawmilling. The potential of the district's forests of jarrah and blackbutt had first been noted by the explorer, Gregory, when he traversed the country nearly half a century earlier. But because of isolation and lack of transport, no sawmilling industry had developed during the early days of settlement. Despite these problems, the quality of the timber eventually attracted





A hydraulic pumping station being established for tin mining operations near Greenbushes, 1902.
(Courtesy of the Department of Mines)

Old whim. Huge logs were hauled to the siding using oxen and a whim.

sawyers to the region and by 1895 a steam-driven mill was operating in Bridgetown. Known as Scott's Sawmill, it was powered by a small steam engine and employed six workmen.

The coming of the railway to Bridgetown in 1898 was also to give an added boost to the timber industry and the region's economy. Large numbers of axemen were needed to cut the sleepers for the new line and by 1897 over 300 sawmill workers and sleeper hewers were reported to be employed in the area.

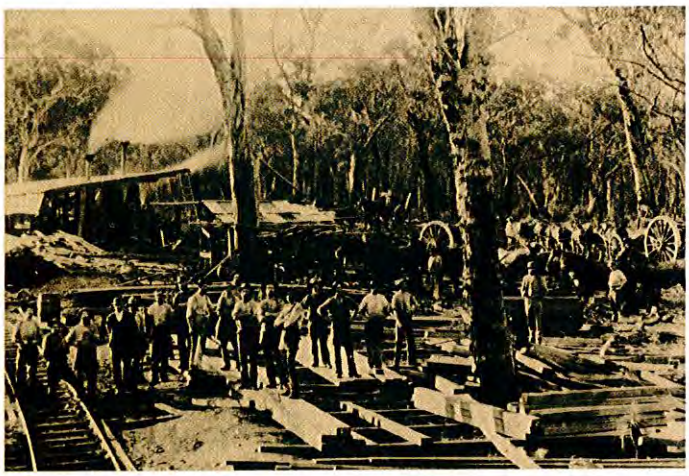
Once the railway was completed, timber concessions were taken up and Greenbushes became one of the major early centres for the timber industry. Two mills were constructed to the north of Greenbushes, one built by the Adelaide Timber Company, the other by the Timber Corporation Ltd. When in full production, the Adelaide Timber Company was cutting over 600 hectares of forest a month to feed their mill while the Timber Corporation mill could process more saw-timber in ten days than Scott's Mill could in a year.

In addition to these large operations, a number of spot mills appeared around Bridgetown and Greenbushes. These mills primarily cut timber under contract for large trading companies or produced sawn timber for local housing needs.

Coming at a time when the demand for local agricultural products had stagnated, both tin mining and sawmilling played a major part in the Valley's development. The good market conditions for meat and grain which existed during the early years of settlement in the colony had declined during the 1870s and 1880s with the abolition of the convict transportation scheme. However, the mining and sawmilling industries, with their large workforces, were to re-stimulate the district's agricultural economy and attract new settlers to the Valley.

Old spot mill. Small spot mills sprang up throughout the Valley as the value of its magnificent timbers was recognised.

Sleeper cutters. Cutting railway sleepers with a broadaxe was a highly skilled job.



Emergence of an Agricultural Landscape

While the mining and timber industries expanded, new settlers continued to take up and clear land in the Valley. Some of the original holdings changed hands. Lindsay Armstrong acquired Southampton while Padbury sold Ferndale to Charles Harper. As the years passed, new arrivals purchased portions of the old pastoral leases to build their homesteads on. The town of Geegelup, later called Bridgetown, grew rapidly.

Throughout the Valley, cattle and sheep were still the predominant agricultural interests. As leases were subdivided and holdings shrank, many settlers attempted to increase the productivity of their grazing lands by clearing the scrub and smaller trees and ringbarking the remaining large stems. In 1896, Inspector-Surveyor Brockman commented favourably on a ringbarking experiment in the Valley when he reported, "The Tanjannerup Estate is well grassed throughout, and is most suitable for farms and orchards. Ringbarking has made a marked improvement in the grass and this should be still more noticeable after another year."

By 1899, extensive tracts of land had been or were being cleared by ringbarking. In that year, Inspector Thompson, reporting to the Lands Department on farming conditions and land prices in the Valley, stated, "I inspected the remaining blocks in this area and found that the trees had practically all died and few had shot up again from the butts, which is generally the worst feature of ringbarking in this class of country. I am of the opinion that the present price, 12s. 6d. an acre, is most reasonable and certainly should not be lowered, especially as the payments extend over a period of twenty years. The area generally looks well, and has well repaid the outlay expended on it for ringbarking, as it has proved a good object lesson to the settlers in the immediate neighbourhood who have gone in extensively for ringbarking, with splendid results as far as grazing is concerned and the water supply has also considerably increased."

The arrival of the railway in 1898 at Bridgetown also played a significant role in the development of agriculture in the district, for it provided a vital transport link to outside markets. This coincided with a further advance in agriculture, the introduction of superphosphate fertiliser in place of the guano fertiliser that had been previously used.

During this period, subterranean clover was accidentally introduced to the district in chaff delivered to the Dwalgannup property of Forrest. Realising its potential, Forrest sowed it for pasture. Before long, improved varieties were introduced from South Australia and clover was being sown throughout the ringbarked areas of the Valley. Also about this time, the introduction of fencing wire made stock control much easier. A revolution in farm management was under way.

Yet another stimulus to the local economy was the development of an apple industry in the district. Spurred on by the early success of apple enthusiasts like John Allnutt, settlers in the Valley began planting orchards and investing in the new industry. With the population increasing from the discovery of gold at Coolgardie and Kalgoorlie in the early 1890s a large new market for apples was created. By 1905, the first big shipments of apples were being railed to the Goldfields and many growers were enjoying gross earnings of between £150 and £200 per acre.

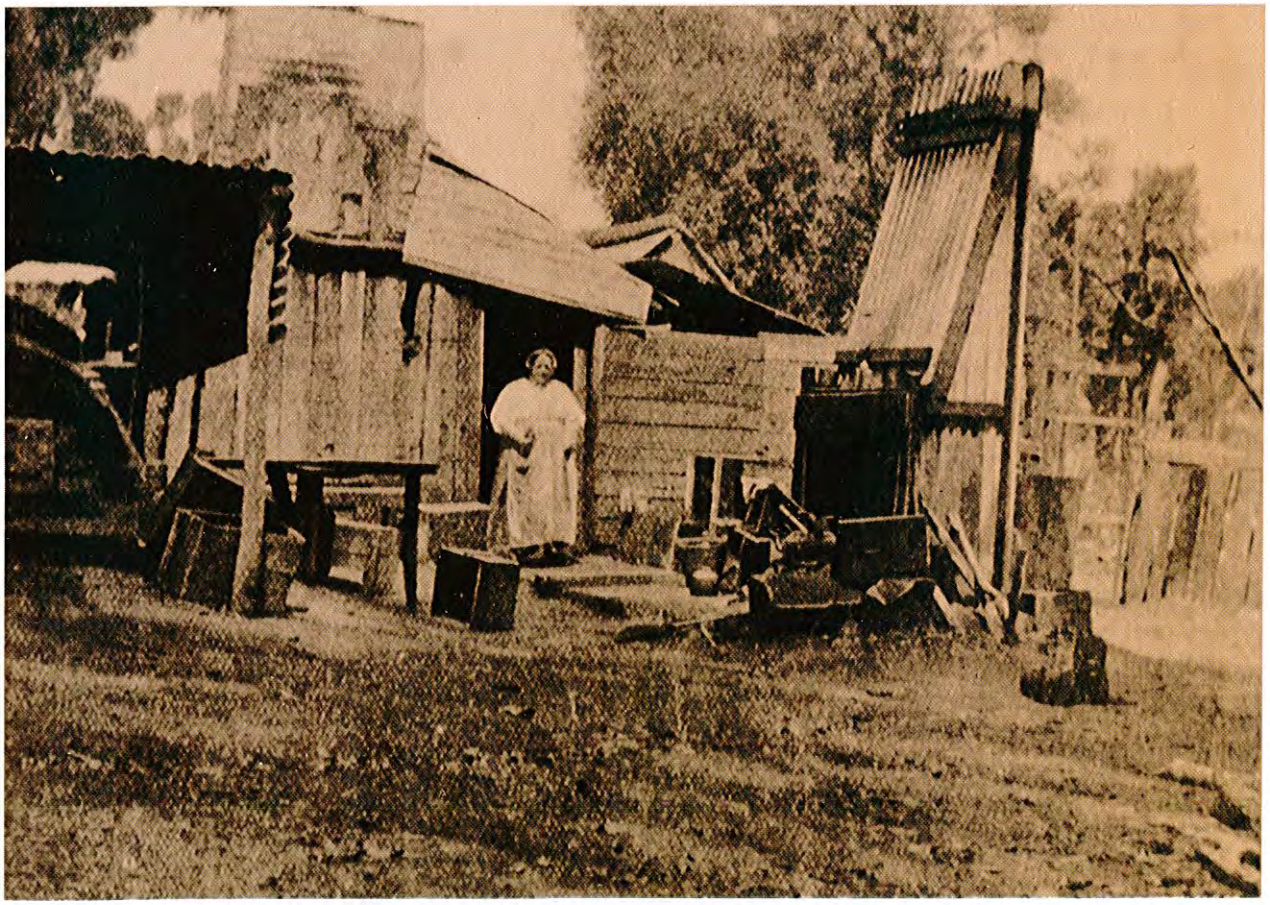
Thus, at the turn of the century, the character of the Valley and the life-style of its residents were changing rapidly. Clearing for homesteads and crops was extended to former grazing lands and ringbarked paddocks were becoming common. Introduced pasture species competed with the native flora under an ecological imbalance created by the broadcasting of superphosphate. The timber industry was beginning to carve into the magnificent stands of jarrah and blackbutt while open-cut tin mining operations were expanding near Greenbushes. The

seemingly unending forest that once covered the region had disappeared from the Valley and in its place a pastoral, patchwork landscape had begun to emerge.

The native fauna of the district suffered as a result of changes wrought both within and outside the Valley. The devastating effect of intensive agricultural clearing is best seen further to the east in the wheatbelt, where many native species have been listed as extinct since the arrival of Europeans. Habitat destruction and the salination of rivers are likely to have had a great effect on the native fauna.

Early bush locomotive. Before the days of the motor truck the "puffing billy" was king of transport.

Mrs. Bertwhistle, an early settler of Greenbushes.
(Courtesy of the Bridgetown High School)



Extensive agricultural clearing in the catchment of the Arthur River, which joins the Blackwood River upstream from Bridgetown, has been the major cause of the salination of the waters of the Blackwood. Just when the river became saline is difficult to say. It may always have contained some salt, since some species of riverside flora have quite high tolerance to current salt levels. The earliest records are from the Department of Railways which used the waters of the Arthur River and the Blackwood River to fill rail steam engines. In the early 1920s increase in salt in water supplies all around the south-west caused some concern, as salty water is unsuitable for use in steam engines. Records of water salinity testing of the Blackwood River at Bridgetown go back to January 1904. Since then the water has become steadily more salty as clearing in and around the Valley increased. Current testing shows a decrease in salt levels where the water flows through forested areas including those areas planted with pine. However, the water is generally unsuitable for drinking, although it is used for watering of stock and irrigation in the Valley. It is likely that river fauna have been affected by the increased salinity, but this is difficult to assess. Certainly, species of fresh-water fish which don't occur in the main stream of the Blackwood do occur in fresher side streams.

Perhaps more important than the clearing of the land and destruction of habitat was the introduction of exotic species, foreign predators and diseases. To the east of the Valley in the drier parts of the settled areas, the disappearance of many native fauna species was noted in the 1880s. Shortridge, writing in 1909, believed such a wide scale reduction in so many species was brought about by an epidemic disease which he had been told appeared to be some kind of "marasmus" or wasting disease, perhaps brought in by introduced animals. However, the introduction and spread in the wild of the domestic cat is likely to have played an important role. It may even have been the main cause of the decline. It is of interest that Gilbert, in 1843, received a specimen of a phascogale killed by a cat at Williams.

There was a further decline in native fauna populations during the early years of this century. Mr. Muir of Deeside recorded in 1911 that the smaller marsupials were becoming very scarce in the south-west. Rat-kangaroos and hare wallabies in particular appeared to have suffered. It seems likely that a similar decline occurred in the Valley.

Certainly, the next major decline of south-west fauna, which resulted from the spread of the European red fox, was felt throughout the district. This animal invaded the west from the eastern states, closely following the rabbit. It was first sighted on the south coast in 1915 and spread up the west coast and through the eastern agricultural areas, reaching Geraldton by 1925. It did not enter the forested areas until the 1930s.

In retrospect, the introduction of the cat and the fox probably had a greater impact on some species of valley fauna than clearing for agriculture. Nevertheless, habitat destruction by clearing obviously affected a wide range of animals.

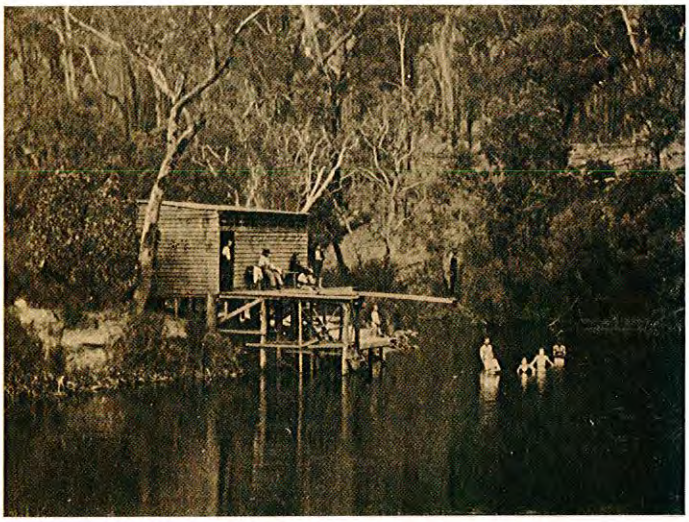
Change was not restricted to the district's landscape and its flora and fauna. As the twentieth century developed, the life-style of the Valley residents was changing. Along with the railway, improved roads permitted better communications among neighbours and faster travelling between communities. Soon clubs, societies and other organisations were formed for social and business interests, and towns throughout the district began organising and entering teams in various sporting competitions. The friendly homestead gathering of family and neighbours was no longer the sole source of social contact and communication for the district's inhabitants as it had been several decades earlier.

As the region's population continued to grow and prosper, the thrust of settlement

moved further south to the Manjimup region. In little over half a century, the forested vales and steep hillsides along the Valley had been transformed into one of the State's most productive mixed farming areas. The future looked promising indeed for those residents who made their living on the land.

Bathing in the deep pools of the Blackwood was a popular pastime on hot summer days.
(Courtesy of the Bridgetown High School)

During the 1890s, early apple orchards like this one provided fruit for the fast-growing Goldfields towns.



War Years

Despite all the agricultural improvements that had occurred during the last decade of the nineteenth century and the first few years of the present century, farming was still a rugged, physically demanding life. Even with the assistance of bullocks and horses, farmers and pastoralists found the tasks of ringbarking, clearing, fencing and cultivating "back-breaking" and time-consuming. So, when many of the younger men of the district were called upon to serve their country during the 1914-18 war, some families were faced with an arduous struggle to keep their farms intact and operating.

In order to settle some of the returned soldiers on the land, the State Government started a soldier settlement scheme at the end of the war. Residents of the district assisted the scheme by setting up committees to help find suitable land for these returned servicemen.

The end of the war also saw the appearance of the first tractors in the district. The few machines that were available were used primarily in the construction of roads and dams and therefore initially had little impact upon either the method or scale of farming operations.

It was during this time that the rabbit made its way to the Valley. Finding conditions to its liking, it multiplied quickly and soon the improved pastures were showing the effect of its numbers.

During the 1920s the first large tracts of land in the south-west were dedicated as State forest under the control and management of the Forests Department, which had been founded in 1919. Included among these areas were most of the remaining timbered tracts within the Valley.

At the end of the 1920s, Australia was beginning to feel the impact of the Great Depression which had spread throughout the developed and developing nations of the world. While better off than his town and city counterparts, the man on the land was unable to completely escape its effect. In Western Australia many migrants, including those who had fled from Europe, ventured south to look for work. Some of these men set up camps along the Blackwood and began calling from farm to farm looking for work, which was scarce. Many would have died had it not been for kindly farmers who would butcher old stock and hang the carcasses in the camps for the men to divide among themselves.

Several schemes were started locally to find work for the unemployed. Following the closure of a large sawmill at East Kirup (Grimwade) in 1928, workers were re-employed on pine planting projects. The first commercial plantings were established under this programme in 1933 on areas of heavily cut-over State forest in the Grimwade area. Another work project, more limited in extent, was launched at Nannup to settle the unemployed on farms.

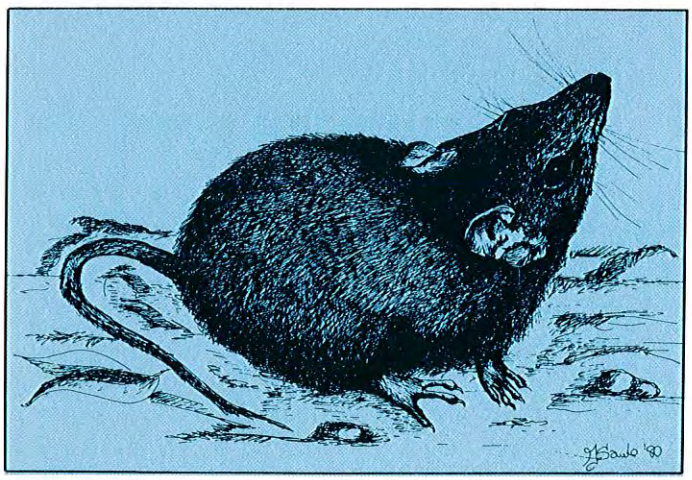
It was during the depression years that dairy farming became an important agricultural land use within the Valley. With the opening of the Manjimup Butter and Cheese Depots in 1930, the Balingup Cheese Factory in 1933 and the Bridgetown Cream Depot in 1939, many farmers of the district turned to dairying as a major source of income.

As the 1930s drew to a close, people throughout the south-west were beginning to recover from the effects of nearly a decade of depression. These years had left their mark to varying degrees on everyone, but the outlook for the residents along the Blackwood appeared promising. Apples, dairy products and meat were still in demand. And while ominous reports of trouble in Europe were no doubt followed with interest and concern, such news could not dampen the optimism that many must have held for a more prosperous future.

Then came World War II and the men left their farms again for the front. This time, the Government stepped into the breach and, where labour was short, Italian

The introduced rabbit and European fox multiplied rapidly and soon became pests in the district.

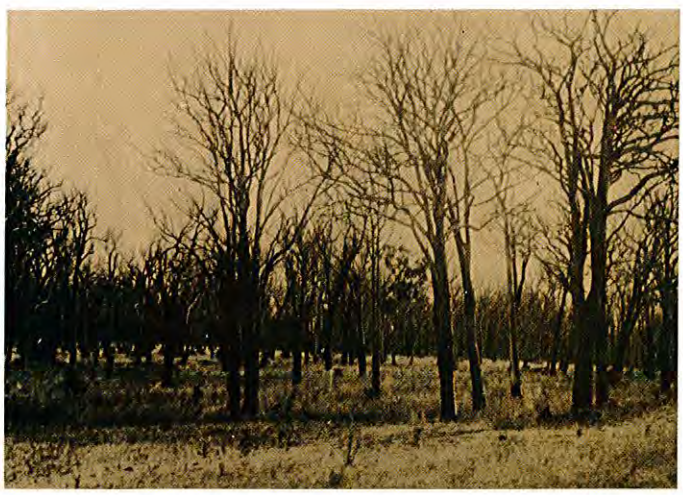
Marsupial mouse or mardo. Small marsupial mice were frequently caught and killed by the settlers' domestic cats, who, not finding them to their taste, brought them home.



Ferndale today. Owned by the Forests Department, the main homestead is currently being renovated to maintain historical and architectural values.
(G. Pead)

Ringbarked trees. Magnificent tracts of forest were ringbarked to make way for grazing lands and orchards.

This early poster advertises the sale of Ferndale in one of Western Australia's prime farming areas.



prisoners-of-war or internees were brought in to keep the farms running smoothly.

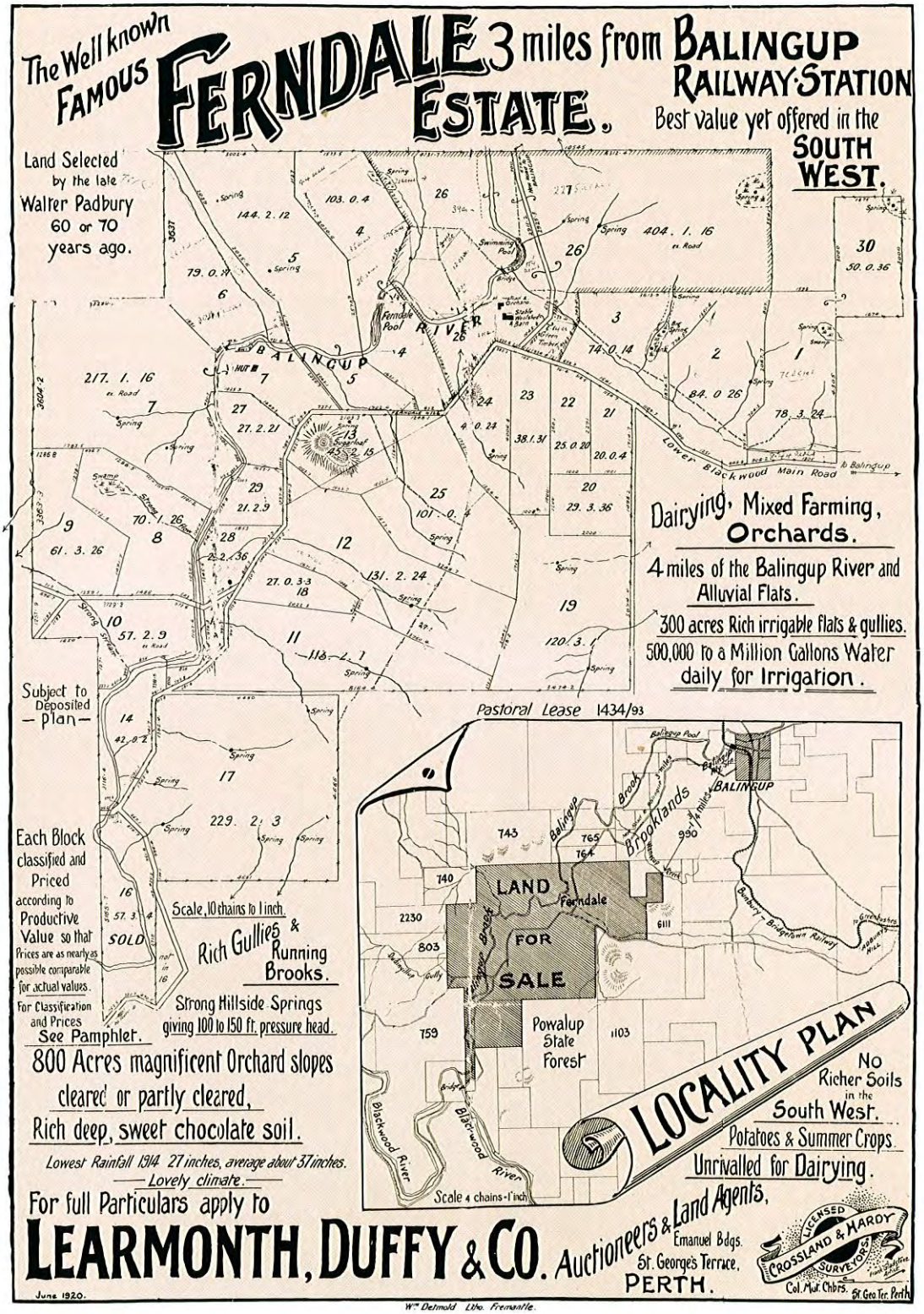
But there were other problems. The apple industry lost its overseas markets and fertilisers were unprocurable. Labour-intensive jobs such as pruning were abandoned and there were no new plantings. To offset the lack of markets the Government paid growers a grant for the amount of fruit on the trees. This, it was hoped, would save the apple industry from foundering during the war years.

At the close of the war the men returned to their farms, but the war had left a profound impression on them. They were now familiar with sophisticated machinery used in the services, and many wanted to mechanise their farms. The post-war years were to be accompanied by a boom in tractor use in the Valley. Superphosphate, once spread by hand, and later by horse and cart, was now spread by tractors. However, even the best tractors could not negotiate some of the steep land within the Valley, and farms on these areas were disadvantaged.

In the late 1950s there was an overall agricultural slump, particularly in dairying. Those farmers with a high proportion of less productive steep lands suffered most. In an attempt to overcome their difficulties, some farmers overstocked their lands, which inevitably led to further problems.

By the early 1960s many people in the Valley had turned away from dairying. Most dairy products now came from the coastal plain near Harvey, helped by an irrigation scheme that had been built during the depression. In the late 1960s the cheese factory at Manjimup closed down, as did the Bridgetown Cream Depot.

The area of productive orchard had also been reduced. Between 1940 and 1958 the acreage of productive orchard had decreased from 5 250 hectares to 4 700 hectares. The fortunes of the Valley were changing once again.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Pines Come to the Valley

With few natural softwoods and no native pines, Australia in general, and Western Australia in particular, has always had to rely on imports for the bulk of its softwood timber requirements. As a result, the Forests Department, like other forest services throughout the country, had undertaken an extensive pine planting programme designed to reduce the State's dependence on overseas supplies. In the 1950s, the Forests Department embarked on a programme of purchasing farmland in the Blackwood Valley for the purpose of growing pines.

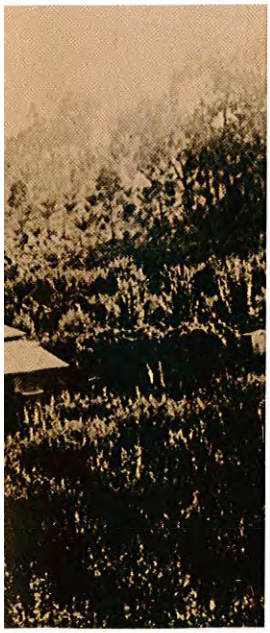
The Blackwood Valley was to prove a highly suitable area for this activity. The deeper, more fertile soils throughout the Valley were well suited to plantation establishment, and healthy pines could be grown without the use of fertilisers. In addition, the repurchase of farmland by the Forests Department provided land-owners with some hope of financial return at a time when the district's agricultural economy was generally depressed. Many farmers welcomed the opportunity to sell the less productive portions of their farms—the steep, upper slopes, often covered with bracken—while they retained the more fertile valley floors for grazing and cultivation. Later, in the mid-1960s and early '70s, the economics of farming the steeper land were improved by aerial applications of superphosphate and the introduction of the rabbit flea, which reduced the rabbit population by more efficient spreading of myxomatosis. These and other factors meant that many farmers in the Valley had less desire to sell their land and move from the district.

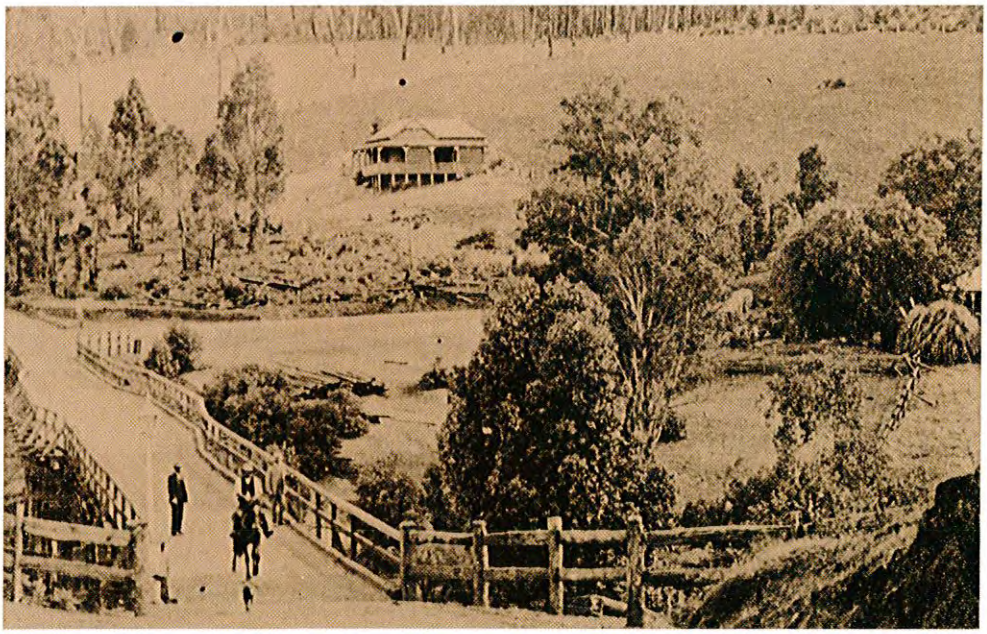
To provide trees for the pine plantation programme in the Valley, two Forests Department nurseries were established at Nannup. By the late 1960s, they were producing over two million pine seedlings annually, the bulk of which were planted in the surrounding district. Today, over 17 000 hectares of farmland has been purchased on the open market by the Forests Department and much of it subsequently planted with radiata pine. In addition, several private pine planting companies have been formed in recent years and these are actively engaged in plantation establishment in the district.

The reforestation of this rolling landscape has by no means been an easy task. The steepness of the terrain has ruled out the use of machines so that most planting has had to be by hand. Also, the susceptibility of pine seedlings to rabbit damage during their first year in the field has necessitated various control measures in the establishment phase. However, once established, pines require little tending apart from periodic

Making a start—view of clearing of Turner's Road, circa *1920s.*
(Courtesy of the Bridgetown High School)

The old (third) bridge at Bridgetown 1904.
(Courtesy of the Bridgetown High School)





pruning and thinning to ensure good production of high quality timber. Some problems have been encountered on the shallower soils where drought deaths among the older pines have occurred following a succession of low-rainfall years. However, this problem is being overcome by increased thinning and by the planting of trees at wider spacings.

The development of pine plantation forestry in the district has not been without its critics. Recently, concern has been voiced by some residents who believe that the presence of the dense, inflammable plantations pose an increased threat of uncontrolable wildfires. This problem has been largely offset, however, by the development of an aerial fire detection system and a highly trained and mechanised fire-fighting force. Increased attention has also been focussed on agro-forestry practices whereby grass fuels are reduced by grazing stock in the more open plantations.

The establishment of pines in the Valley has also brought changes and criticism of a different nature. To some, the pine tree is an unwelcome intruder, an exotic weed which has no place in the Western Australian landscape. Still others assert that plantations are devoid of wildlife, a virtual biological desert in which native mammals, birds and reptiles are not to be found. Plantation establishment, along with other land uses, has without question further altered the character of the Valley landscape, its flora and fauna. What then is the nature of these changes?

The Landscape

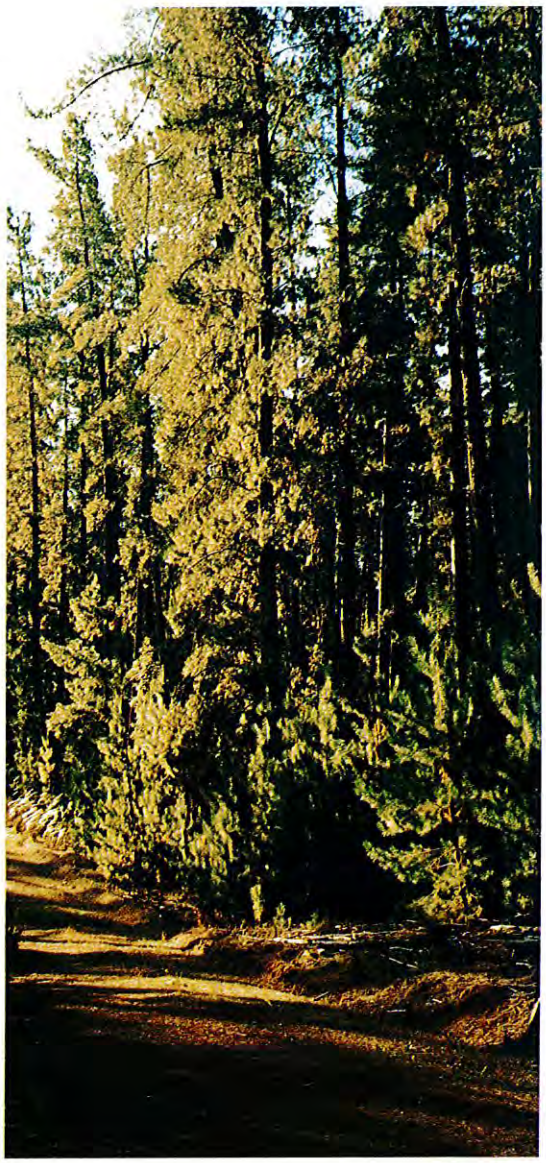
With the introduction of pines to the Blackwood in the 1950s and '60s, the Valley began to take on a new appearance. Bracken-covered hillsides, too steep to cultivate with modern machinery, began to disappear under an undulating dark green carpet. Where large veteran jarrah and marri once stood, row upon row of pines now marched across the landscape like

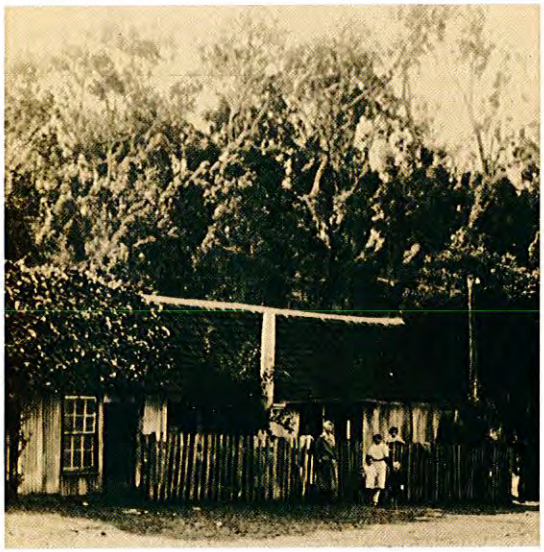
Fifty-year-old pines at Grimwade. Mature pines at Grimwade planted by unemployment relief labour during the Great Depression.

Typical of early dwellings in the Valley, this cottage is made with corrugated iron walls and wooden shingled roofing.
(Courtesy of the Bridgetown High School)

Old tractor used in road and bridge building.

Orchard in decline. Changing market conditions resulted in the decline of many of the orchards after the second World War.





columns of an invading army. Those who had toiled for years to clear the Valley for farming only to sell their land for the purpose of regrowing trees must have viewed this invasion with mixed feelings.

There are a number of objections to pines on aesthetic grounds. Their straight symmetrical trunks, pointed crowns and dense foliage contrast sharply with the gnarled, fire-blackened boles and spreading crowns of the native eucalypts. Likewise, their orderly, regimented arrangement in the landscape further emphasises the visual contrast between indigenous and man-made forests. The general lack of understorey flora also contributes to the homogeneous image of pine plantations and furthers the arguments of their critics. Others find pines an attractive addition to the south-west landscape, possibly a reminder to some of earlier memories of the softwood forests of the northern hemisphere.

As the rate of planting accelerated, concern was expressed from several quarters that the plantation programme would, in time, destroy the scenic attractions of the Valley landscape. One of the principal fears was that pines would eventually extend along and abut the major scenic drives through the Valley, thereby obliterating all views of the surrounding countryside.

Consequently, in the early 1970s, a landscape management plan for the Blackwood was prepared by the Forests Department. Simply stated, the objective of this plan was to identify the major visual attractions of the Valley so that alternative planting options could be considered to preserve these attractions. As a result of this plan, attention was focussed on the attraction of the pastoral landscape and the need to retain substantial unplanted areas, particularly in the lower portions of the Valley adjoining existing public roads. In the same plan, mention was also made of the importance of preserving several historic homesteads which the Department had acquired with the land purchased for pine planting.

Pine flank both sides of the Blackwood near the small community of Lewana. Once a Forests Department settlement, Lewana is now managed by the Department for Youth, Sport and Recreation as a family holiday camp.

Pines for planting in the Valley are grown in the Forests Department tree nursery at Nannup.

Pine harvesting. Harvesting the pines by thinning out some of the trees produces valuable timber and allows the remaining trees more space to grow larger.


KOCKUMS
KOCKUMS

In the years since the formulation of this plan, greater emphasis has been placed on the preservation of scenic values. Open paddocks now merge with carpeted hillsides of pine and eucalypt covered slopes and ridges to produce a varied mosaic of pattern, colour and texture. Along the Valley floor, much of the land remains in private ownership and consequently, the open pastoral character of the landscape has been maintained in many areas.

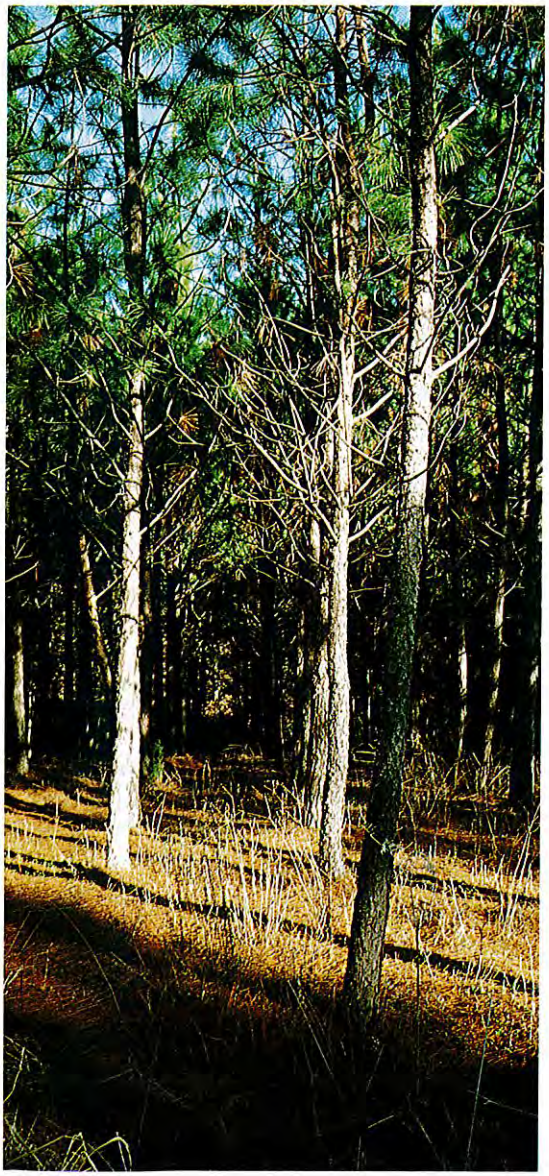
On other properties repurchased by the Forests Department, some areas of pasture land, which are the most fertile and productive for pine growing, have been left unplanted to preserve views. Only in the area around Lewana do pines border the Nannup-Balingup Road and this enclosure offers a contrast to the more open areas further along the Valley towards Nannup. Today the drive between these two centres is recognised by many as one of the most picturesque in the south-west.

Undeniably, the landscape has not been treated with sensitivity in all instances and mistakes have been made, some out of ignorance, others unavoidably. Nevertheless, the Valley still retains much of its scenic appeal.

Rows of young pine march across the hillsides, giving a sense of regimentation to the landscape.

The popular image of a pine forest understorey. This bare "needle floor" condition exists only for a portion of the life of the forest.

Older pines such as these 50-year olds at Grimwade permit enough light for understorey plants to grow.



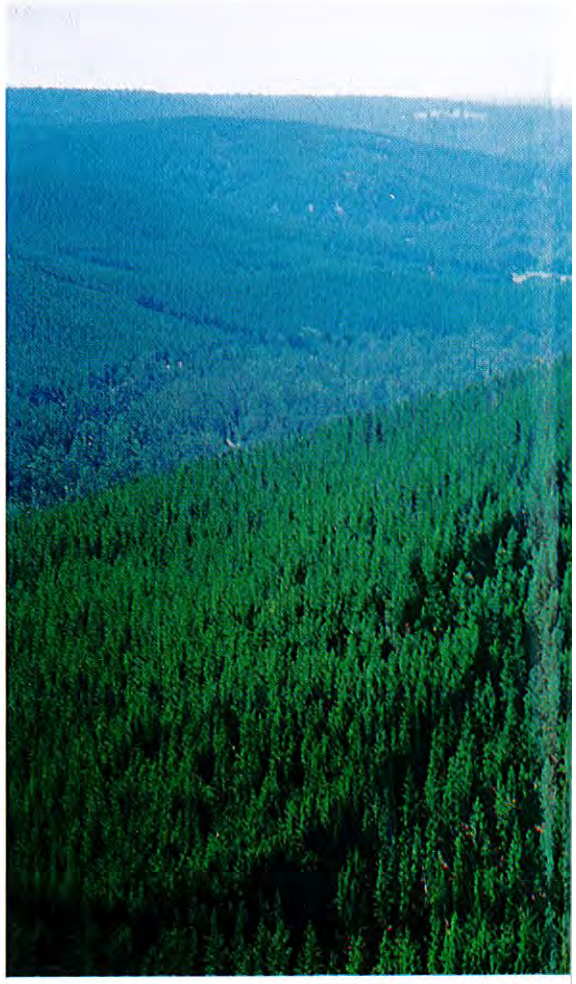
The Flora and Fauna

The transformation of the Valley landscape reflects the change which has occurred in the district's flora. A combination of clearing, grazing, phosphate fertilisers and introduced grasses have contributed to the destruction of the native scrub in the strip of uncultivated land along the river. In its place, a new, largely alien habitat comprising a mixture of native and introduced plants and weeds has been created.

Where the tree canopy has remained, the more hardy understorey species, such as the blackboy and zamia palm, persist. Along the river banks and creeks, thickets of paperbark and ti-tree still grow, although many of the moister sites have been invaded by dense thickets of introduced blackberries. Around the numerous small dams created for fire control purposes there is a mixture of rushes and reeds.

Since much of the Valley was formerly grazed and some portions still are, it is not surprising to find that pasture grasses form a major and important component of the new forest ecosystem.

Many annual species are present and flourish wherever the tree canopy is open enough to permit enough light for their growth. Creeping perennial species such as kikuyu and buffalo grass also occupy extensive areas of the drainage system.

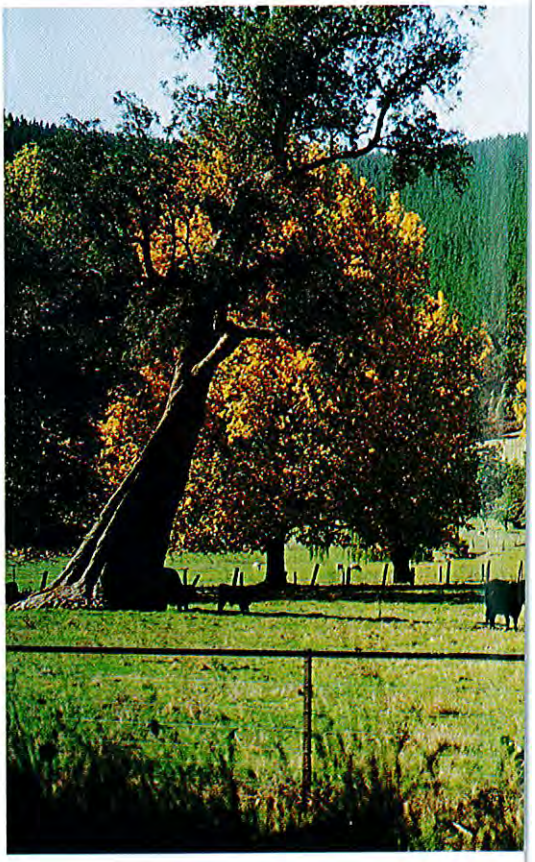


Agro-forestry. Forestry and farming combine, as cows graze amongst the young pines. The system provides extra grazing for cattle and sheep and reduces the fire hazard which dry grasses create in summer. Note the pine thinnings in the foreground.

What was once a relatively insignificant element in the landscape becomes a dominant scar. Here an existing transmission line corridor gives the appearance of a mown strip where it crosses a hill reforested in pine. Such visual impacts can often be avoided provided landscape values are considered as an integral part of land use planning.

These changes that have occurred in the valley flora since settlement have also been accompanied by widespread changes in the fauna. Some species have disappeared, perhaps for ever, while others have come to stay. Departures and new arrivals have, to some extent, tended to balance each other out and consequently, it is difficult to determine whether there has been any appreciable decrease in the overall diversity of fauna within the Valley. While the total number of birds and mammals is probably less now than it was before the arrival of the first Europeans, the present patchwork of forest, grassland and pines of different ages contains what is perhaps the greatest range of species since the early days of settlement.

For example, while some species of birds such as the pardalotes, the western shrike thrush and the rufous tree-creeper are uncommon, few species have disappeared altogether from the Valley and many new ones have now established themselves as permanent residents. Open grassland has brought the western magpie, the peewit, the pipit and the willy wagtail, all of which nest in the area. Also, the small dams and semi-permanent swamps have attracted more swamp hens, herons, coots and other species of water fowl. The numbers of predatory species, including hawks, eagles and the barn owl, are also higher than in adjoining areas of native forest, presumably because the numbers of prey species such as rabbits and mice have increased.



Historic homestead "Golden Valley". Several of the old farmhouses have been preserved within the pine forests as places of historic interest.

The contrasting colours and textures of deciduous trees enrich the landscape and provide an attractive foreground setting to the pine and eucalypt covered hillside in the background. Such views make the drive between Balingup and Nannup one of the most picturesque in the South-west.

Among the younger pines adjacent to the fertile, fluvial grassed flats, the grey kangaroo and introduced rabbit thrive. Likewise, the introduced ship rat is common in the dense creek-side vegetation and in the perennial grasses, while the European pig occupies the wetter habitats in forty-year-old pines at Grimwade further east.

Where the blackberry has taken hold, the short-nosed bandicoot, rabbit and ship rat have occupied the dense thickets which have provided a refuge from the fox and other predators. These thickets are also the stronghold of the magnificent blue or fairy wren and the spotted scrub wren.

Within the pine plantations themselves, the introduced house mouse is now the most common mammal, particularly on the slopes in the younger stands. Some species of bird, notably the western rosella, the scarlet robin and the fantail, seem to occur in comparable or greater numbers than they do in the adjacent eucalypt forest. Some of these species nest in the Valley while others undoubtedly nest in the adjacent forest and only feed among the pines. The red-capped parrot, the brown and the yellow-rumped thornbills and the golden whistler are also particularly conspicuous among the younger pines. A few species, including the red-eared finch and the white robin, use pine trees for nest sites.

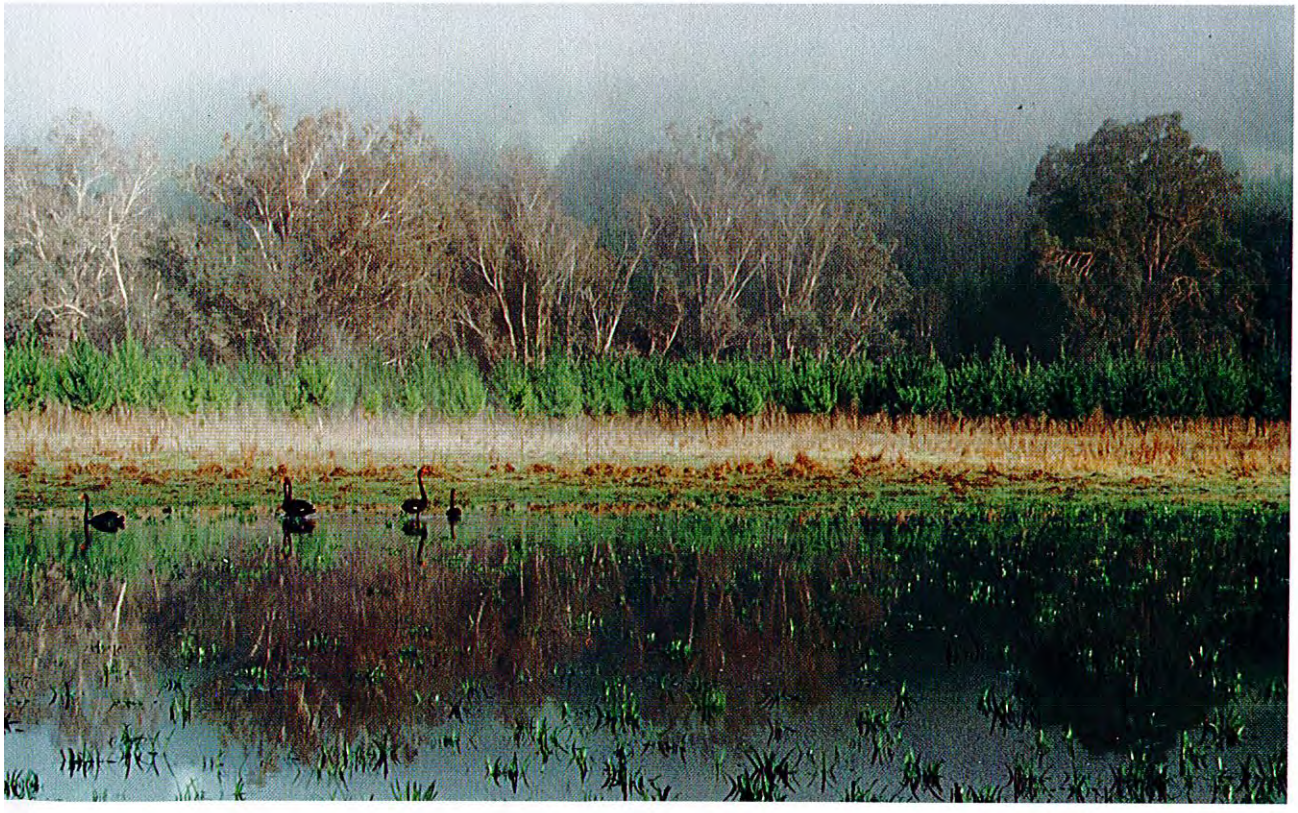
Most of the frog species that might be expected to occur in the Valley can still be found there, and although reptiles, skinks and lizards have decreased in numbers, a surprising number still occur. Despite the increased salinity of the Blackwood River caused by large-scale agricultural clearing in the upper reaches further to the east, several species of fish inhabit its waters.

Considered a rare and endangered species, the red-eared firetail finch nevertheless occurs in the Blackwood Valley. It nests and feeds on the seeds of rushes and introduced weeds.

(Alwyn Pepper)

Small seasonal lakes provide food for swans and other waterfowls. Numbers of coots, waterhens and little grebes also nest and rear their young on these regularly every year.

(T. Leftwich)



Native mammals have perhaps suffered the most as a result of changes to the flora, for they form a highly specialised group adapted to a unique forest habitat. The decline and disappearance of some species, for example the native cat, dunnart and quokka, are due partly to the change in habitat and partly to predation by introduced species such as the feral cat and the European red fox. However, the absence of other species, such as the southern bushrat and the yellow-footed marsupial mouse or mardo is puzzling. The former may have been replaced by the ship rat, but the absence of the latter is a mystery, particularly as a close relative of the mardo thrives in old pine habitats in Victoria. Bats, which are not subject to predation to any appreciable extent, are also low in numbers.

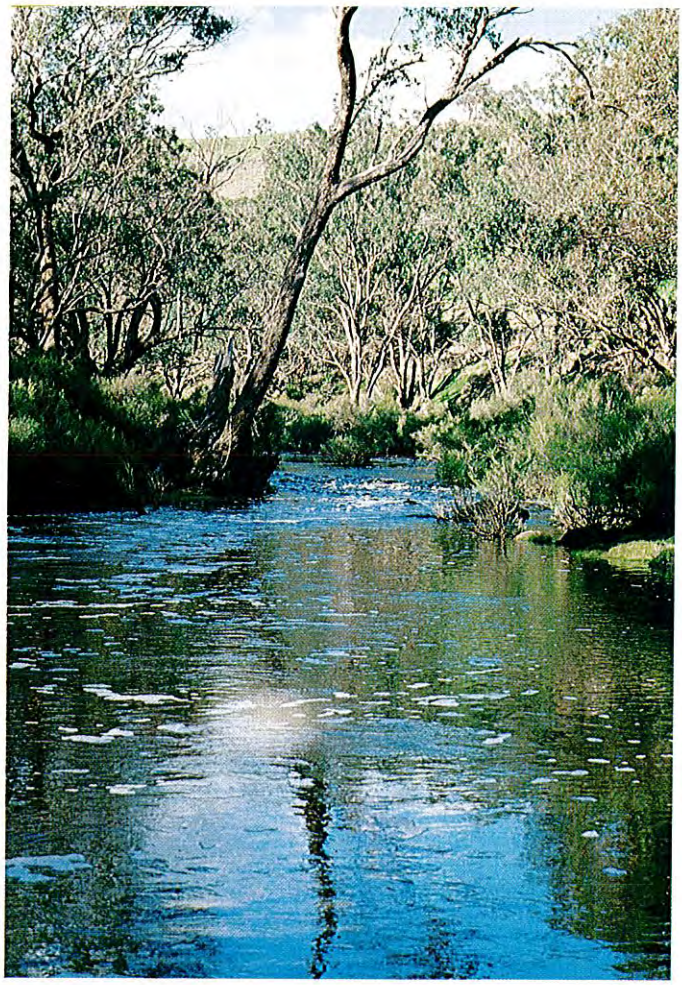
In many respects the changes to the flora and the fauna of the district are not as readily apparent as are those which have occurred to the overall landscape itself. The disappearance of indigenous plants and animals and the arrival of new ones has often gone unnoticed. These more subtle changes are, however, indicative of the ephemeral, sometimes fragile nature of the Valley environment and the role that man has played in transforming it.

Small native fishes such as this night fish (Bostokia porosa), *are still common in the river and small streams of the Valley.*

Not all native species shun the exotic pines. Here the shy white-breasted robin is seen sitting on her nest in the branches of a small pine tree.

Native forest now preserved as a wildlife reserve along the river harbours a rich bird life.

(*All T. Leftwich*)



Epilogue

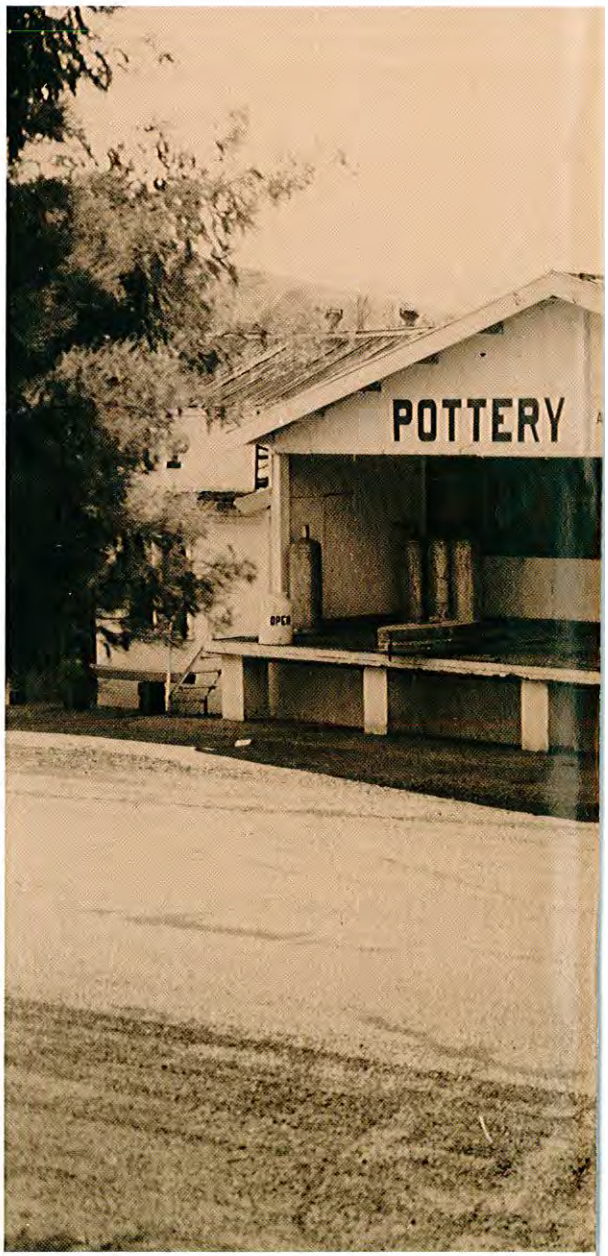
Much has taken place in the Blackwood Valley in the space of little more than a century. Infrequent use by the aborigine, who created little disturbance to the environment, has been supplanted by European man's active and continuous transformations.

One of the most obvious changes that has occurred since the war years is the reduction in the rural population. With the trend toward amalgamation of smaller farms into larger holdings and the increasing mechanisation of rural industries in general, many of the Valley inhabitants who were at one time engaged in farming, mining and the timber industry have left the land and migrated to the larger towns and cities. As elsewhere in the south-west once prosperous communities which supported a range of services and amenities have gradually declined as a result of this population shift.

Improved transportation links have also had their effect, bringing most country dwellers within easy reach of the shopping, entertainment and sporting facilities of the larger regional centres such as Bunbury and Manjimup. At the same time, the shift in population has resulted in a loss of revenue to local shires, as land repurchased by the State Government is non-rateable.

As in previous times however, such changes to the district's social structure and economic base appear to be temporary in nature. The past few years have seen a reversal of the urban migration as increasing numbers of people seeking an alternative life-style have taken up residence in the Valley.

In retrospect we may well imagine the sense of adventure, the excitement of discovery of the early explorers, the unflagging energy and relentless drive of the first settlers who initiated the changes which have made the Valley what it is today. Later generations of farmers, timber-cutters and sawmillers, miners and shopkeepers, foresters and new settlers all have had their dreams and ambitions for the Valley. Some



Cheese factory—the old accommodates the new. The old cheese factory in Balingup has recently been converted into a pottery by new settlers to the Valley.

have been more powerful, more energetic or dedicated and have had a greater effect, but they must surely all have had in common a belief in what they did. Man does not freely labour at that in which he has no faith.

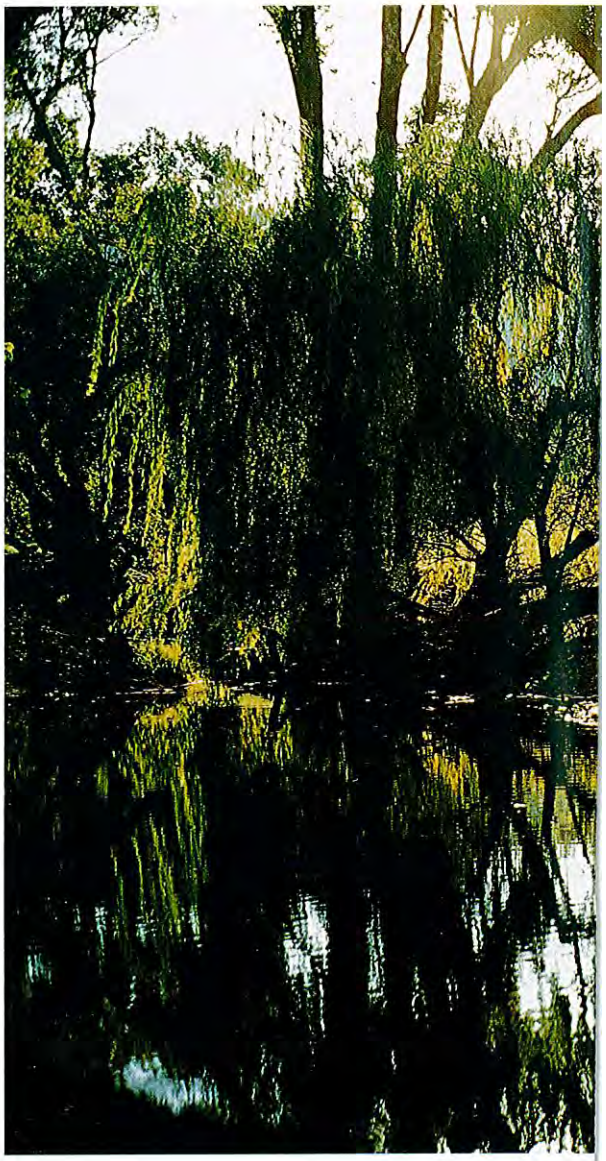
The landscape, environment and character of the Valley therefore reflect the needs, the ambitions and dreams of the people who have lived there or those who have come into contact with it over the years.

Although each succeeding change has further altered the area, none has completely swamped that which went before. Thus the Valley today is a mozaic or patchwork quilt of history reflecting the many and various stages through which it has gone to finally arrive at its present state. Here and there remain patches of the original forest interspersed with pasture, pines, the occasional ringbarked tree, an old cottage or mud brick homestead, large spacious homes and new brick and tile constructions. A few apple orchards and orange groves remain and the occasional vine can still be found growing amongst the weeds in an abandoned garden. In places small groups of oaks, elms, poplars and other deciduous exotic trees are all that remain to mark the spot where once stood an early settler's home.

Dense reeds and ti-trees still grow in places along the many small creeks flowing through the pines and pastures. Delicate native wisteria, wattles and hibbertias still bloom amongst remnant forest patches where parrots and lorikeets screech overhead. Herons and cormorants hunt for small fish and crustacea in the river and many small dams, while the alien kookaburra feasts on grasshoppers in nearby fields. At night the native owls hunt for European house mice and foxes chase rabbits through the pines watched by kangaroos grazing on pastures of introduced grasses.

From an advantage point the observer may still see a vast landscape, quite different it is true, no longer unbroken forest, but nonetheless beautiful. The unobtrusive greens of the native forest trees contrast sharply with the dark green of the pines and vivid autumn colours of the deciduous poplars, the bright green fields and the red roofs of the farmhouses.

Through it all flows the river meandering towards the sea. The history of the Valley unfolds around it and is there for all to see.



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Acknowledgements

During the course of writing this booklet much research was done and many sources of reference were used. Among the many people and organisations who contributed we would particularly like to thank the following: the Conservator of Forests, the Battye Library and the following persons: Amy Armstrong, Bob Browne, Helen Davies, Roy Doust, Rosalyn Evans, Mr. Fielder, E. P. Hodgkins, Ethel Rose, Len Talbot, Emma Taylor.

Appendix I—Birds

This is a list of the birds collected or recorded by Forests Department personnel while conducting biological surveys in the pine plantation areas of the Blackwood Valley. The list should not be regarded as being in any way complete, undoubtedly many species were missed during the brief spring survey. However, the list provides a valuable record and indicates the variety of bird life still to be found within the Valley today.

BIRDS[1]							
Species	*Areas recorded*			*Species*	*Areas recorded*		
	Forest remnants thickets and farmland	*Within pine areas*	*Dams and river environs*		*Forest remnants thickets and farmland*	*Within pine areas*	*Dams and river environs*
Emu (*Dromaius novaehollandiae*)	*	*		Splendid fairy-wren (*Malurus splendens*)	*	*	
Australian grebe (*Tachybaptus*)			*	Red-winged fairy-wren (*Malurus elegans*)	*	*	
Great cormorant (*Phalacrocorax*)			*	Western gerygone (*Gerygone fusca*)	*	*	
Little pied cormorant (*Phalacrocorax melanoleucos*)			*	Inland thornbill (*Acanthiza apicalis*)	*	*	
Darter (*Melanagaster*)			*	Western thornbill (*Acanthiza inornata*)	*	*	
White-faced heron (*Ardea novaehollandiae*)	*	*	*	Yellow-rumped thornbill (*Acanthiza chrysorrhoa*)	*	*	
Pacific heron (*Ardea pacifica*)	*		*	White-browed scrub-wren (*Sericornis frontalis*)	*	*	
Straw-necked ibis (*Threskiornis spinicollis*)	*		*	Scarlet robin (*Petrolca multicolor*)	*	*	
Black swan (*Cygnus atratus*)	*	*	*	Grey fantail (*Rhipidura fuliginosa*)	*	*	
Australian shelduck (*Tadorna tadornoides*)	*	*	*	Restless flycatcher (*Myiagra inquieta*)	*	*	
Pacific black duck (*Anas superciliosa*)	*	*	*	Willie wagtail (*Phipidura leucophrys*)	*	*	
Maned duck (*Chenonetta jubata*)	*		*	Golden whilster (*Pachycephala pectoralis*)	*	*	
Musk duck (*Biziura lobata*)			*	Rufous whistler (*Pachycephala rufiventris*)	*	*	
Whistling kite (*Haliastur sphenurus*)	*	*		Grey shrike-thrush (*Colluricincla harmonica*)	*	*	
Brown goshawk (*Accipiter fasciatus*)	*	*		Varied sittella (*Daphoenositta chrysoptara*)	*		
Collared sparrowhawk (*Accipiter cirrhocephalus*)	*	*		Rufous treecreeper (*Climacteris rufa*)	*		
Wedge-tailed eagle (*Aquila audax*)	*	*		Striated pardalote (*Pardalotus striatus*)	*		

Australian hobby (*Falco longipennis*)	*	*		Silvereye (*Zosterops lateralis*)	*	*	
Brown falcon (*Falco berigora*)	*	*		Brown honeyeater (*Lichmera indistincta*)	*	*	
Australian kestrel (*Falco cenchroides*)	*	*		White-naped honeyeater (*Melithreptus lunatus*)	*		
Common bronzewing (*Phaps chalcoptera*)	*	*		New Holland honeyeater (*Phylidonyris novaehollandiae*)	*	*	
Dusky moorhen (*Gallinula tenebrosa*)	*		*	Western spinebill (*Acanthorhynchus superciliosus*)	*	*	
Purple swamphen (*Porphyrio porphyrio*)	*	*	*	Tawny-crowned honeyeater (*Phylidonyris melanops*)	*		
Eurasian coot (*Fulica atra*)	*		*	Red wattlebird (*Anthochaera carunculata*)	*	*	
White-tailed black cockatoo (*Calyptorhynchus baudini*)	*	*		Little wattlebird (*Anthochaera chrysoptera*)	*		
Western rosella (*Platycercus icterotis*)	*	*		Red-eared firetail (*Emblema oculata*)	*	*	
Red-capped parrot (*Purpureicephalus spurius*)	*	*		Australian magpie-lark (*Grallina cyanoleuca*)	*	*	
Port Lincoln ringneck (*Barnardius zonarius*)	*			Dusky woodswallow (*Artamus cyanopterus*)	*	*	
Shining bronze-cuckoo (*Chrysococcyx lucidus*)	*	*		Australian magpie (*Gymnorhina tibicen*)	*	*	
Pallid cuckoo (*Cuculus pallidus*)	*	*		Australian raven (*Corvus corondoides*)	*	*	
Southern boobook (*Ninox novaeseelandiae*)	*	*					
Barn owl (*Tyto alba*)	*	*					
Tawny frogmouth (*Podargus strigoides*)	*	*					
Australian owlet-nightjar (*Aegotheles cristatus*)	*	*					
Laughing kookaburra (*Dacelo novaeguineae*)	*	*					
Sacred kingfisher (*Halcyon sancta*)	*	*					
Rainbow bee-eater (*Merops ornatus*)	*	*					
Welcome swallow (*Kirundo neoxena*)	*	*					
Tree martin (*Cecropis nigricans*)	*	*					
Richard's pipit (*Anthus novaeseelandiae*)	*	*					
Black-faced cuckoo-shrike (*Coracina novaehollandiae*)	*	*					

[1]After Royal Australian Ornithological Union Atlas List

Appendix II—Other Fauna

Other fauna recorded or collected by Forests Department personnel surveying the pine plantation areas of the Blackwood Valley.

MAMMALS[1]	
Native Species	*Status*
Grey kangaroo (*Macropus fuliginosus*)	Very common throughout the area
Brush wallaby (*Macropus irma*)	Rare—in young pines
Brush-tailed possum (*Trichosurus vulpecula*)	Occasional—in gums along the Blackwood River
Western ringtail possum (*Pseudocheirus peregrinus*)	Rare—one sighted in pines near Nannup
Brush-tailed phascogale (*Phascogale tapoatafa*)	Believed to be rare (road casualty near Nannup)
Short-nosed bandicoot (*Isoodon obesulus*)	Occasional—in dense gully vegetation
Bats	A number of species are present but none appear to be common in the pines
Introduced Species	*Status*
Pig (*Sus scrofa*)	Confined to pines near Grimwade
Rabbit (*Oryctogagus cuniculus*)	Common throughout the area
Black rat (*Rattus rattus*)	Very common in dense valley vegetation
House mouse (*Mus musculus*)	Very common throughout the area
European fox (*Vulpes vulpes*)	Common throughout the area
Cat (*Felis cattus*)	Common throughout the area
FROGS[2]	
Slender tree frog (*Hyla adelaidensis*)	
Green and gold tree frog (*Hyla moorei*)	
Banjo frog (*Limnodynastes dorsalis*)	

REPTILES—continued
Skink Lizards
Bobtail (*Tiliqua rugosa*)
King skink (*Egernia kingii*)
Smith's skink (*Egernia napoleonis*)
Red-legged skink (*Ctenotus labillardieri*)
Burrowing skink (*Hemiegis peronii peronii*)
Lerista elegans
Sandhill skink (*Morethia lineoocellatus*)
Morethia obscura
Menetia greyii
Bungarra (*Varanus gouldii*)

Moaning frog
(*Heleioporus eyrei*)
(*Heleioporus inornatus*)
Crinia georgiana
Crinia species

SMALL FISH

Common minnow
(*Galaxias occidentalis*)
Night fish
(*Bostokia porosa*)
Western pygmy perch
(*Edelia vittata*)
Hardy head
Athermosoma species

Introduced Species

Carp
(*Carassius species*)
Mosquito fish
(*Gambusia affinis*)

REPTILES[3]

Snakes

Blind snake
(*Typhlina australis*)
Tiger snake
(*Notechis scutatus occidentalis*)
Dugite
(*Demansia nuchalis affinis*)

Geckos

Marbled gecko
(*Phyllodactylus marmoratus*)

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[2]Main, A. R. (1965), *Frogs of Southern Western Australia*, W.A. Nat Club Handbook No. 8.

[3]Storr (W.A. Museum) pers. comm.

Appendix III — Flora

NATIVE PLANT SPECIES IN THE BLACKWOOD VALLEY	
Family	*Botanical Name*
POLYPODIACEAE	*Cheilanthes tenuifolia*
	Pteridium esculentum
CYCADACEAE	*Macrozamia reidlei*
TYPHACEAE	*Typha angustifolia*
SCHEUCHZERIACEAE	*Triglochin mucronata*
	Triglochin procera
GRAMINEAE	*Briza maxima*
	Briza minor
	Stipa sp.
	Tetrarrhena laevis
CYPERACEAE	*Lepidosperma angustatum*
	Lepidosperma effusum
	Lepidosperma leptostachyum
	Lepidosperma tetraquetrum
RESTIONACEAE	*Leptocarpus* sp.
LILIACEAE	*Burchardia* sp.
	Stypandra imbricata
	Xanthorrhoea preissii
AMARYLLIDACEAE	*Anigosanthus flavida*
	Conostylis sp.
IRIDACEAE	*Orthrosanthus* sp.
	Patersonia occidentalis
	Patersonia xanthina
ORCHIDACEAE	*Caladenia macrostylis*
	Prasophyllum sp.
PROTEACEAE	*Banksia grandis*
	Banksia littoralis
	Dryandra nivea
	Hakea amplexicaulis
	Hakea lissocarpa
	Persoonia longifolia
RANUNCULACEAE	*Clematis pubescens*
	Ranunculus colonorum
DROSERACEAE	*Drosera* sp.
PITTOSPORACEAE	*Billardiera* sp.
	Sollya heterophylla
MIMOSACEAE	*Acacia browniana*
	Acacia dentifera
	Acacia pulchella
	Acacia saligna
	Acacia urophylla (2)
	Albizzia lophantha

INTRODUCED PLANT SPECIES TO THE BLACKWOOD VALLEY		
Family	*Common Name*	*Botanical Name*
GRAMINEAE	Fog grass	*Holcus lanatus*
	Kikuyu	*Pennistum clandestinum*
		Paspalum dilatatum
	Wild oat	*Avena fatua*
	Couch	*Cynodon dactylon*
	Buffalo grass	*Slenolaphrum secrundatum*
	Pampas grass	*Cortadenia selloana*
	Water couch	*Paspalum distichum*
ARACEAE	Arum lily	*Arum italicum*
LILIACEAE	Easter lily	
	Yucca sp.	
	Garlic	*Allium salivum*
AMARYLLIDACEAE	Jonquil	*Narcissum jonquilla*
IRADACEAE	Guildford grass	*Romulea rosea*
	Iris	*Iris germanica*
	Watsonia sp.	
ORCHIDACEAE		*Monadenia micrantha*
MORACEAE	Fig	*Ficus* sp.
	Mulberry	*Morus nigra*
SALICACEAE	Willow	*Salix baby lonica*
	Poplar	*Populus* sp.
FAGACEAE	Oak	*Quercus*
POLYGONACEAE	Sorrel	*Rumex* sp.
	Dock	*Rumex* sp.
	Double gee	*Emex australis*
NYMPHACEAE	*Dolacus* sp.	
	Marshmallow	
	Water lily	*Nymphea* sp.
RANUNCULACEAE		*Ranunculus parviflorus*
CRUCIFERAE	Wild radish	*Ranunculus raphanistrum*
ROSACEAE	Blackberry	*Rubus fruticosus*
	Rose	*Rosa* spp.
	Apple	*Malus domestica*
	Plum	*Prunus* sp.
	Cherry	*Prunus* sp.
	Pear	*Pyrus communis*
		Pyracantha sp.
MIMOSACEAE		*Acacia mollissima*
		Acacia melanoxylon
PAPILIONACEAE	Sub-clover	*Trifolium subterraneum*
	Sub-clover	*Trifolium* sp.
	Manjimup clover	*Lotus minor*
	Tree lucerne	*Chamaecytisus proliferus*

PAPILIONACEAE		*Bossiaea aquifolium*
		Bossiaea linophylla
		Bossiaea ornata
		Chorizema ilicifolium
		Daviesia cordata
		Daviesia horrida
		Gastrolobium spinosum
		Hardenbergia comptoniana
		Hovea elliptica
		Jacksonia sp.
		Kennedya coccinea
		Kennedya stirlingii
		Oxylobium lanceolatum
GERANIACEAE		*Erodium cygnorum*
		Geranium pilosum
OXALIDACEAE		*Oxalis corniculata*
TREMANDRACEAE		*Tetratheca affinis*
		Tremandra diffusa
		Tremandra stelligera
POLYGALACEAE		*Comesperma flavum*
EUPHORBIACEAE		*Phyllanthus calycinus*
STACKHOUSIACEAE		*Stackhousia huegelii*
SAPINDACEAE		*Dodonaea attenuata*
RHAMNACEAE		*Trymalium spathulatum*
DILLENIACEAE		*Hibbertia amplexicaulis*
		Hibbertia hypericoides
		Hibbertia montana
THYMELAEACEAE		*Pimelea clavata*
		Pimelea spectabilis
MYRTACEAE		*Agonis flexuosa*
		Agonis linearifolia
		Agonis parviceps
		Baeckea camphorosmae
		Calothamnus sp.
		Darwinia citriodora
		Melaleuca sp.
EPACRIDACEAE		*Leucopogon capitellatus*
		Leucopogon propinquus
		Leucopogon verticillatus
LOGANIACEAE		*Logania serpyllifolia*
GENTIANACEAE		*Centaurium australe*
LABIATAE		*Hemigenia incana*
RUBIACEAE		*Opercularia hispidula*
GOODENIACEAE		*Dampiera cuneata*
COMPOSITAE (Asteraceae)		*Craspedia* sp.
		Erigeron crispus
		Helichrysum ramosum
OXALIDACEAE	Soursobs	*Oxalis* sp.
RUTACEAE	Citrus	
MELIACEAE	Cape lilac	*Melia azandrach*
VITACEAE	Grape	*Vitus* sp.
MYRTACEAE	Lily pilly	*Acmena smithii*
ONAGRACEAE		*Fuschia* sp.
PRIMULACEAE	Pimpernel	*Anagallis foemina*
OLEACEAE	Olive	*Olea* sp.
LOGANIACEAE		*Buddeia alternifolia*
BORAGINACEAE	Patersons curse	*Echium lycopsis*
SCHROPHULARIACEAE		*Verbascum virgatum*
COMPOSITAE (Asteraceae)	Thistle milk	
	Thistle scotch	
	Capeweed	*Crypotostemma calendulaceum*
		Hypocheris radicata
	Stinkwort	*Inula graveolens*
	Michelmas daisey	
LEGUMINOSAE		*Robinia pseudoacacia*


FLOUR