

Organ Pipes National Park — a study in applied conservation

by GEOFF EDWARDS

Technical Officer, National Parks Service

For countless years, while generations of the aboriginal people roamed freely over the land, Jackson's Creek near Sydenham wound gracefully along the tree-lined valley which it had carved for itself through the basalt plain and into the older deposits underneath. In so doing it exposed the renowned basalt columns known as the "Organ Pipes".

In 1972, when an area of 162 acres along the creek was dedicated as a national park, an entirely different vista presented itself. Large infestations of noxious weeds interspersed with bare eroding soil dominated the scene, rabbits were rife, the creek was clogged with slime and empty shotgun cartridges lay among the miscellaneous litter. In some spots it seemed that only the lichens held the rocks from eroding into the creek. Twenty-four proclaimed noxious weeds between them covered nine-tenths of the area.

The land had been first selected in the 1850's, part of it by John Pascoe Fawkner. For decades stock grazed it, the fertile river flat had been ploughed for vegetables and an apricot orchard once grew beside the old homestead, now in ruins. Eventually the land passed to E. A. Green, who bequeathed it to the Government.

Our first impression was one of despair, on contemplating the formidable task of developing this degraded land into a national park worthy of the name. This doubt was only partly alleviated when we discovered wildflowers and other vestiges of the original vegetation scattered here and there among the weeds. However, interest in the Organ Pipes had not arisen overnight. The proposals of more than two

decades' standing for a reserve there had to be respected.

NOW A NATIONAL PARK

National parks have two main objectives:

- (a) To preserve the natural environment in a condition as close as possible to that existing at the time of first European settlement.
- (b) to provide for the education and enjoyment of visitors.

The second of these aims was achieved in part by publishing a set of leaflets and a teachers' manual, by advertising the park in the Education Gazette and by appointing a Ranger.

To achieve the first aim, the Service had first to restore this park to its original condition. To our knowledge no one had previously been confronted by so wide a range of environmental abuses at the one site, and although the regeneration project at Tower Hill to some extent has pioneered the concept of rehabilitating a small defined reserve, there were many substantial differences.

As explained in the following pages, this operation is technically very complex, for in biological systems there are no

independent variables. It would be less than honest to claim that we understood the intricate relationships between the elements of the natural environment, or that we were confident of success.

Having resolved to restore the park to its original state, it became necessary to determine precisely what that condition may have been, so that the events of 130 years could be retraced and the processes of deterioration reversed. Probably the authors of the rather quaint old "Victorian Naturalist" articles such as the 1900 *Excursion to Sydenham* hardly guessed how precious their accounts would be for this purpose more than half a century later. Further valuable insights into the life and environment of the old times have been provided by living descendants of the early pioneers.

By these means, by examining surviving pockets of native vegetation and by referring to some academic studies, we have pieced together a composite image of the early landscape, which included the following main land-forms:

- (a) *Basalt plains* — the pre-dominant physiographic



The Organ Pipes.

Photo—Lands Department



Horehound, boxthorn and rubbish—the car park area in 1972.

Photo—R. Osborne

- type; largely grassland strewn with composites and other wildflowers, with scattered trees.
- (b) *River and its banks*—woolly tea-tree and river bottle-brush; river red gums abounded
 - (c) *Steep, rocky valley sides*—clothed mainly by wedge-leaf hop-bush, acacias and she-oaks
 - (d) *Sedimentary outcrops*—carrying golden wattle, yellow gum and desert cassia.

The reader will appreciate that it was of little use removing weeds merely to allow other weeds to sprout in their place. Destruction of horehound near the entrance simply encouraged a vigorous crop of nettles and amaranth weeds. Desirable species must be planted to fill the vacuum and in fact may be valuable tools in depriving weeds of sunlight and space, as well as in suppressing weed seedlings. Natural systems are dynamic, not static.

WHAT IS INDIGENOUS?

Biological species are not homogeneous; in fact a species name is one given simply to an assemblage of individuals which more closely resemble each other than they do individuals which are excluded. An example of the intrinsic natural variability within species is the range of colours from white to crim-

son in common heath. However, not all differences are obvious. There may be subtle variation such as in site preference, time of flowering or palatability to fauna. Sometimes this variation is randomly scattered throughout a population, but at other times it is linked with geographical distribution. Sometimes the variation is caused or modified just by environmental conditions, but very often it is based on genetic differences which are as much a part of the flora as the plants themselves; accordingly the Service should attempt to keep the park's vegetation as uncontaminated with foreign genes as possible. A national park is intended to perpetuate the flora of the locality, not to be a botanical garden of plants from near and far.

It would be no fun to be a botanist in a century's time in the difficult position of trying to determine the original distribution of variants of those native species which have been planted or sown widely by European man.

To ensure that we were propagating the truly local races, the Service stated that seed and cuttings were to be collected only from parent plants within the park. Exceptions were formally specified for the many species which are now scarce or non-existent in the park. Although this stipulation may

sound a little arbitrary, in fact it has added almost nothing to the expense and inconvenience of propagating trees and shrubs and only a few months' delay to the first batch. Furthermore, few of the ground flora species and virtually none of the grasses indigenous to the Keilor Plains were obtainable from commercial nurseries.

In the search for sources of propagating material, members of the Local Maribyrnong Valley Committee have combed the district and have discovered remnants of natural vegetation along creeks, road and railway reserves, school sites, the aerodrome, and other fragments of Crown land. All have deteriorated but all have been valuable. When transplanted, species have been largely restricted to the soil type(s) on which they formerly grew. A river bottle-brush would be almost as incongruous on the basalt plain as an exotic pine, and less likely to survive.

To date some 1700 tubed stock have been planted out. Each is watered well on transplanting and once during the first summer, and is mulched with bark chips to retain moisture and exclude weeds. Considering the harsh conditions and the prevalence of two-legged vandals, four-legged vermin and six-legged insect parasites, they have established remarkably well.

GRASS OR GROUNDSELS?

Having resolved which species were theoretically entitled to a position in the programme, it was necessary to decide which species would be most effective for the rehabilitation tasks bearing in mind the ultimate objectives for each section of the park. Factors such as ease of raising seedlings, ease of transplanting, extent of ground cover provided and rate of growth had to be balanced with the need to keep broadly to the vegetation forms of the original landscape. It was agreed that without under-rating the value of or necessity for trees and shrubs, the bulk of the park's acreage would have to be direct-seeded

with native perennial grasses to provide the rapid coverage necessary to smother weeds, halt erosion and build up humus in the soil. Since kangaroo grass is difficult to germinate, the choice narrowed down mainly to two species of wallaby grass tussock.

A little wallaby grass seed was collected in the park in 1972 by students from St. Albans High School, and was later broadcast in trial plots as well as over broad acres. Experiments were carried out using polythene sheet, hessian shelters and cultivated soil but by far the best aid to germination was found to be a rabbit-proof fence.

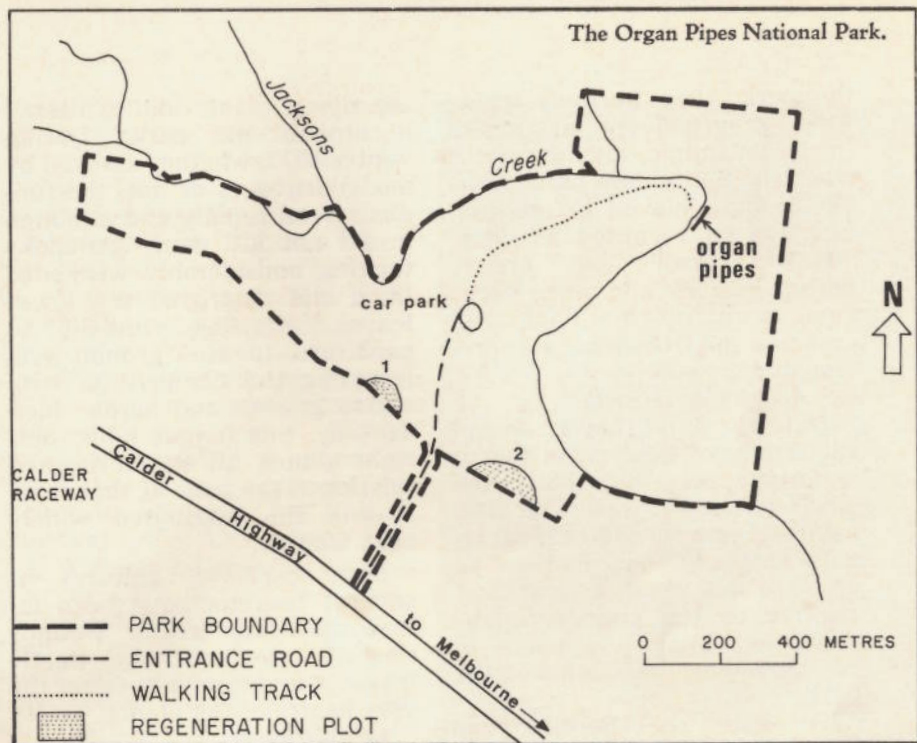
In 1973 the wallaby grass in the park seeded heavily and an acre or so was harvested. This will be stored for a four- or five-month after-ripening period and then sown after the late autumn rains.

Nevertheless, there were good reasons for not restricting the planting to just grasses and a few shrubs. Although they don't provide much ground cover for smothering weeds, the groundsel and lilies and everlastings and blue devils and orchids not only add a variety and a sparkle of interest to the programme, but also in many cases are rare and are daily threatened elsewhere by road-making operations, aggressive weeds, littering, zealous weed spraying along utility easements and "fire hazard reduction". The last main surviving colony of the white diuris orchid was accidentally burnt before seeding in 1972, was partly sprayed in 1973, and has had to be fenced to exclude cyclists.

It is hoped to perpetuate these species by propagating them in the park. Some plots have been fenced off and replanted heavily as a practical demonstration of what might be achieved.

DECISIONS, DECISIONS

So far I have described only the processes of deciding which plant species should be grown and in what sections of the park. Decisions of equal complexity



had to be made in determining which rehabilitation tasks were most urgent. The resources of manpower and money were and still are just as limited as the time available is short, and it was important to utilize them as efficiently as possible. Obviously it was pointless to sow grass seed while rabbits survived to eat out young seedlings; no real progress could be made on rabbit control while boxthorn harbour remained; it was difficult to justify spending time on removing shrubby boxthorns while the rapidly spreading artichoke thistles were in flower; and so forth.

Priority is not easy to define. A task of long-term highest precedence may have to be abandoned during a particular week when a particular annual weed breaks into flower. And even the best laid plans go astray when, for example, fencing materials become "unavailable indefinitely", or when the Ranger has an accident which puts him off work for a few months. Priorities change from day to day, season to season.

High priority, however, has had to be given to the following elements:—

A. Recording.

The value of rehabilitation work is greatly enhanced if there

exists a detailed record of the condition of the site at the time work commences. This was achieved at the Organ Pipes in two main ways:

(i) Photographs on black and white, colour, infrared and false colour film were taken from a set of permanent marked points. Similar photographs will be re-taken periodically.

(ii) Students from the Melbourne College of Education conducted a series of investigations into the natural history, cultural history and visitor usage of the park in 1972. It is hoped to arrange further research along these lines by other students in future. To enable investigators to pinpoint sites in the park precisely a 200 ft. master-grid has been superimposed on a base map.

B. Rabbits.

The key to successful regeneration in this park, as elsewhere, is elimination of rabbits. It is difficult to comprehend the vast damage which rabbits cause until one has seen dense growth inside a fenced plot surrounded by bare earth, such as near the car park.

The first major task undertaken at the Organ Pipes was erection of a netting fence to prevent rabbits from re-invading

the park; then burrows inside were progressively destroyed. In the meantime, myxoma virus was released widely. Much has yet to be achieved before rabbits can be regarded as being "under control", but already herbs, grasses and even ferns have sprung up from nooks and crannies and from what was previously bare soil.

C. Artichoke Thistles.

Unfortunately, rabbits do not eat artichoke thistles; in fact it is largely because rabbits and stock do not eat them that they have become weeds. Considerable emphasis has had to be given to this weed, a very close relative of the culinary globe artichoke, since it appears to be spreading throughout the park.

To date the Service has avoided blanket spraying with persistent herbicides and has relied on spot treatment of the centres of adult plants with herbicidal dust. Some plants have been slashed off and the stumps painted with herbicide solution. This work is tedious but is both effective and selective.

The most exciting innovations in artichoke thistle control began when in mid-1972 we noticed a patch of very sick thistles covered with a fungus identified by the Department of Agriculture, Burnley, as *Alternaria*. We collected debris from

the dying plants and scattered it around the park. During winter 1973, whether assisted by our endeavours or not, the fungus spread rapidly and although it did not kill many artichoke thistles, considerably weakened them and destroyed the lower leaves, allowing sunlight to penetrate to the ground and lessening the competition with native grasses and herbs. Incidentally, this fungus killed outright almost all the variegated thistles in the park at that time. It will be distributed widely next winter.

More recently, cultures of soft-rot bacteria have been introduced into fresh wounds slashed into artichoke thistle leaves in an attempt to fester the very hearts of the plants.

In the battle for survival at the Organ Pipes, competing grasses and shrubs may need only a temporary selective advantage in order to become established.

D. Boxthorn.

Although boxthorn bushes are relatively slow to spread, provide some physical protection to the soil from raindrops and even shelter small native birds, it gradually became apparent that they were preventing any vegetation from growing underneath, and furnished excellent harbour for rabbits. They had to go, and so they were sawn, chopped and

slashed, the stumps then being brushed with herbicide.

* * * * *

We analysed the characteristics of the main weed species and tried to exploit the weak points in their armour. By attacking a weed at a vulnerable point in its life cycle or its tissue, it is possible to minimize the effort and expense involved in killing it, and the damage inflicted on the environment.

VOLUNTARY AID

The Service has been greatly assisted by co-operation from an unexpected quarter in this work. The potential of the Organ Pipes has been grasped by a number of independent bodies which have not only voluntarily accomplished much maintenance work but have also added a wider dimension of community value to the programme. First and foremost of these is the Maribyrnong Valley Committee, a sub-committee of the Victorian National Parks Association. This handful of concerned citizens has "adopted" the park and regularly spends one day a month in uprooting weeds, collecting and raising seed, planting out seedlings and planning future procedures. Without them the Organ Pipes project would be at a far more immature stage.

Scouts have not been backward in coming forward. Many senior scouts (now called Venturers) have been awarded a Conservation Badge for practical work in the park coupled with a demonstrated understanding of the ecological processes operating.

Then there have been Keilor Rotaract, Ramblers Walking Club, Laverton High School, Niddrie High School, Buckley Park High School — members and students of these have voluntarily contributed time and energy and in return have experienced a sense of involvement in a community project of lasting worth, not to mention a heightened awareness of the forces which hold a natural environment together.

Separate sites have been allocated to some of these groups

Foreground: horehound, artichoke thistle and reseda.
Centre: the Organ Pipes overlooks the riverflat covered with native wallaby grass.
Background: boxthorn and bare soil.

Photo—Lands Department



so that rather than dissipate their efforts over the entire park they may follow progress on a specific portion. In addition, undisturbed areas have been designated for scientific research.

FUTURE PROSPECTS

Only a small part of the story of the Organ Pipes has been told. For example, all tools had to be downed on more than one occasion when firstly a herd of wild goats and later some sheep strayed into the park. Stock relish native vegetation, but avoid weeds.

I have made little mention of the fauna of the park. It is hoped eventually to reintroduce the koalas, bandicoots, pigmy possums and kangaroos which once roamed free over the plains, and the platypus which was once part of the life of Jackson's Creek. However, it would be futile to do so before their habitat has been restored. When this is achieved native birds will return of their own accord.

* * * * *

This park is not the only pretty spot along Jackson's Creek, nor is it the most natural one nor the only public land. Land of similar character lies for miles along both Jackson's Creek and the Maribyrnong River.

Why should there not be one large Maribyrnong Valley Park along the whole of the Maribyr-

nong River and its tributaries, in which the same protective, conservative measures may be applied for the present and future benefit of the community?

Although the Organ Pipes National Park is small in acreage by traditional national park standards, it is a true park in the finest sense of the term. One has only to observe the dozens of families enjoying a pleasant Sunday afternoon there, and to note the growing number of visits by school groups, to appreciate its rich and varied potential.

It will not be possible in one year or even in ten to repair fully the damage caused by more than a century of grazing by stock and rabbits. Although the regenerative capability of the land continually surprises us, it is not infinite.

The Organ Pipes National Park is nevertheless a demonstration that humans do, just occasionally, have the capacity to learn from their mistakes.

ACKNOWLEDGEMENTS

Among the very many people who have readily given advice or encouragement in jointly developing the Organ Pipes concept, I should particularly like to express gratitude to Mr. J. Lyale, Park Ranger, Mr. B. Kemp and Mr. D. Marsh of the Maribyrnong Valley Committee, and Mr. N. Smith, District Inspector, Lands Department.



White diuris, *Diuris punctata* var. *albo-violacea*, now almost extinct.

Photo—D. Marsh

Concluded from page 20

criteria in each State, or an evolution of legislation has occurred in response to a growing idea of the purpose and nature of national parks and to the pressures of conservation groups. This evolution has proceeded at different rates and there has been no overall implementation of desirable legislation due to the Federal nature of government. As at June, 1972, Victoria had seventeen areas covering 203,471 hectares designated by the United Nations as national parks. These are as follows:—

1. Wyperfeld National Park 56,000 ha
2. Wilson's Promontory National Park 48,340 ha

3. Little Desert National Park 34,000 ha
4. Hattah Lakes National Park about 20,000 ha
5. Mt. Buffalo National Park 10,912 ha
6. Lower Glenelg National Park 8,960 ha
7. Kinglake National Park 5,632 ha
8. Mallacoota Inlet National Park 4,490 ha
9. Fraser National Park 3,100 ha
10. Captain James Cook National Park 2,680 ha
11. Alfred National Park 2,270 ha
12. The Lakes National Park 2,115 ha
13. Wingan Inlet National Park 1,897 ha
14. Lind National Park 1,153 ha
15. Mt. Richmond National Park 800 ha
16. Port Campbell National Park 750 ha
17. Fern Tree Gully National Park 372 ha

Further reading.

- Chadwick, G. F., 1966—The Park and the Town, London, Architectural Press.
- Darling, F., Fraser and Eichhorn, Noel D., 1969—Man and Nature in the National Parks, Reflections on Policy, Washington, D.C., The Conservation Foundation.
- Ise, John, 1961—Our National Park Policy, U.S.A., John Hopkins Press, Baltimore.
- Johnsohn, Warren A., 1971—Public Parks on Private Land in England and Wales, Baltimore and London, John Hopkins Press.
- Schmitt, Peter J., 1969—Back to Nature, The Arcadian Myth in Urban America. New York, Oxford University Press.
- Morcombe, Michael, 1969—Introduction to Australia's National Parks.
- Yi-Fu, Tuan, 1971—Man and Nature, Commission on College Geography Resource Paper No. 10. Association of American Geographers, Washington, D.C.