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A Teachers' Guide to Organ Pipes National Park was first produced in 1973.  
  
It was revised in 1980 by Michael Howes, Grant Watson and Manny Cassiotis, and reprinted several times.  
  
This completely revised and expanded edition was compiled by Geraldine Richards, who worked at the park in 1990 and 1991.  
  
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**THE VALUE OF VISITING THE ORGAN PIPES**  
Organ Pipes National Park, covering 85 hectares, is close to the Calder Highway about 20 km north-west of Melbourne (Melway map 3 D4). It is the closest national park to Melbourne.  
  
The park takes in part of the Keilor Plains, the third largest lava plain in the world, and is an example of a rehabilitated basalt plains grassland ecosystem.  
  
School groups visiting the park can:  
  
        \* study the spectacular basalt formations

1. \* observe a long term indigenous revegetation project

        \* study a variety of ecosystems

1. \* witness how local action by a group of people can make a difference to the environment
2. \* enjoy a pocket of natural calm right on the edge of the suburbs, next to Melbourne airport and a raceway

You can see seven types of wattle in bloom at one time, other easy-to-identify indigenous plants, and an interesting variety of bird life including water birds, birds of prey and brave bush birds in the picnic ground.  
  
School groups can observe and discuss the evidence of human impact on the environment, and the effect of the revegetation project which has been in progress for 20 years. To increase the value of excursions, visit the park in different seasons and over a number of years to observe changes.  
  
  
**Arranging an excursion to Organ Pipes National Park**  
A pre-excursion visit is highly recommended to ensure that you and your students make the most of the excursion.  
  
The park uses a booking system to avoid the congestion of several classes arriving at the same time. Booking also helps the ranger know who is in the park, which is important for monitoring public safety.  
  
Your excursion must be booked through the Park Office at least three weeks before the planned date if the group is larger than six people.  
  
The booking form in this guide (page **6 and** 7) may be photocopied . Booking forms may also be obtained by telephoning the park on (03) 390 1082, by writing to Organ Pipes National Park, c/o Post Office, Diggers Rest, Victoria 3427, or from the box outside the Information Centre  
  
Large groups of students (90 -100) should be divided into smaller groups of 45 - 50, visiting at different times.  
  
  
**Facilities for visitors**  
The park is open every day from 8.00 am until 4.30 pm. The entrance gate is locked at other times to prevent unsupervised access.  
  
A permanent display in the Information Centre is accessible to visitors at all times when the park is open. The display explains the volcanic features of the park, Aboriginal life in the area, early European settlement, the revegetation project and the role of national parks.  
The Information Centre also contains a theatrette and reference material including books, specimens and models. Rangers may be available to present slide talks covering a range of curriculum areas, including management of the park, volcanic activity and flora and fauna of the area. They can also suggest activities appropriate to the season, such as an insect census, dip-netting or tree planting.  
  
Toilets and picnic tables are provided but there are no barbecue facilities. Gas barbecues are permitted. Rubbish bins are provided but visitors are encouraged to take their rubbish home to reduce the environmental cost of rubbish disposal.  
  
  
**What to wear and take**  
This is only a list of suggestions. What you need depends on the activities you are planning. The following items are required by most groups.  
  
\* Sturdy shoes. Some of the tracks are steep and rough  
\* Wet weather clothing. It can be quite windy even if not raining  
\* First aid kit  
\* Binoculars and camera  
\* Field guides (birds , plants, freshwater invertebrates, butterflies, fungi)  
\* Rubbish bags  
\* Drinks and food. There are no shops or kiosks in or near the park.  
\* U.V. cream  
\* Hats  
  
  
**Important information about public land in Victoria**  
  
In Victoria public land is divided into several categories which are looked after differently. These include National Parks, State Parks, Flora or Fauna Reserves and State forests.  
  
National Parks are usually extensive areas of public land of nation-wide significance because of their outstanding natural features and diverse land types. They are generally set aside primarily to provide public enjoyment, education and inspiration in natural environments.  
  
A State Park is an area of public land, generally smaller than a national park, which has a similar level of protection to that of a national park.  
  
Flora and Fauna Reserves are significant both for the value of their plant life and their wildlife populations and habitats. They are set aside primarily to conserve species that may be rare or endangered, or plant and animal communities of particular conservation significance.  
  
State forests are areas of forested public land used by the community for a variety of purposes including timber harvesting and other resource uses.  
  
The public land system aims to protect representative examples. National parks in Victoria are managed under the National Parks Act 1975. This Act is `restrictive' and sets out clearly the permitted activities in a national park. Organ Pipes National Park is listed under Schedule 2 of the Act. Copies of the National Parks Act 1975 are available from the Victorian Government Printing Office Bookshop, Information Victoria Centre, 318 Lt. Bourke Street, Melbourne, (PO Box 203 North Melbourne 3051), telephone (03) 651 4100.  
  
Experience has shown that giving students pre-visit information about the role of national parks and the responsibilities of visitors helps them understand the importance of national parks and encourages them to behave appropriately. A system of legally enforceable penalties operates for serious breaches of the regulations.  
  
Parks are gazetted by the Victorian Government and are funded and administered by the Department of Conservation and Environment.  
  
If you or your students are considering a research project within the park you should first consult park staff, who can advise you where to seek the appropriate permission. All animals, plants and rocks are protected in national parks. For educational purposes on-site observation or photography is preferable to the collection of specimens, which in any case may only legally be done with written permission from the Director of National Parks.  
  
In general when visiting national parks no material may be removed, even if it is only bark or rocks; these may provide habitat for invertebrates such as spiders, crickets or slaters, and reptiles like small lizards. This is particularly important at the Organ Pipes because of its small size.  
  
Groups and individuals must keep to tracks and paths, except with permission from the senior ranger. This minimises the damage caused by erosion and trampling of vegetation.  
  
  
  
**AN INTRODUCTION TO ORGAN PIPES NATIONAL PARK**  
  
The plants and animals of the Keilor Plains today have been largely determined by the impact of European settlement.   
  
Unlike most other national parks in Victoria, Organ Pipes National Park is not a "natural" area with original native plants and animals. The land was farmed and grazed for nearly 140 years before Organ Pipes National Park was established in 1972, and only remnants of its indigenous flora and fauna survived. Since 1972, thousands of indigenous trees and shrubs have been planted, native grasses have been re-established, and some indigenous animals such as sugar gliders have been re-introduced. Others are returning of their own accord: the number of different bird species seen in the park has increased dramatically since 1972.  
  
Records of rainfall have been kept at Organ Pipes since 1972. The area is in a rainshadow receiving an average of 580mm of rain per year. Most rain falls during winter and spring. Rainfall and temperature data from the nearest meterological station (Melbourne Airport) are included in the appendices.  
  
  
**Original plants and animals**  
The clay soils and low rainfall (about 580mm per year) of the Keilor Plains favour grassland vegetation rather than forest. Until the 1840s the area was a vast rolling plain blanketed with native grasses, notably Kangaroo Grass (*Themeda* species) and Spear Grass (*Stipa* spp) and with an extensive range of wildflowers such as daisies, lilies and orchids. Eucalypts and wattles grew along water courses, with she-oaks on the valley sides and scattered across the plains.  
  
Kangaroos roamed the plains, grazing on the grasses. Koalas, gliders and possums frequented the eucalypts; smaller marsupials lived in hollow branches or burrows and fed on insects or seeds. Platypuses thrived in the creeks. Native cats (quolls) and dingoes were the main predators. Birds of the plains included cockatoos, kookaburras, quails, finches and hawks.  
  
**Human impact on the environment**  
Aboriginal people lived on and hunted over the plains. They probably set fire to the grass from time to time to encourage new growth and attract grazing animals to the area for hunting, but otherwise had little impact on the landscape.  
  
European settlers arrived in the Keilor Plains in the 1830s. One of the first was George Evans, who built Emu Bottom homestead (still standing near Sunbury) in 1836. The open, rolling nature of the country made it ideal pasture land for sheep, and squatters took up large tracts of land where the grass was good.   
  
The settlers hunted kangaroos because they were thought to be competing with the sheep for grass. Other furred animals were killed for their valuable pelts, or simply disappeared as their habitat was altered.  
  
To the early settlers, the Australian landscape was drab and monotonous and the animals bizarre. Oaks, willows and pine trees were planted to "beautify" the landscape and make the settlers feel more at home. Boxthorn hedges were established in place of fences; rabbits and foxes were introduced for food and sport. Introduced animals modified the environment by changing the distribution of plant species and preying upon native animals, causing the decline or extinction of many native plants and animals. Rabbits reached plague numbers resulting in severe erosion.  
  
During the 1850s and 1860s the large pastoral holdings were subdivided and the soil broken to grow wheat, oats and barley. Fruit and vegetables were grown in the valleys. The Keilor Plains remained an important source of oats and hay for Melbourne until the 1940s.  
  
The use of superphosphate as a fertilizer adversely affected native plants. Australian species are adapted to soils poor in phosphorus and do not tolerate high levels of this element. This led to further decreases in the number and variety of native plants surviving European settlement.  
  
Various families farmed the Organ Pipes area until it became a national park in 1972. Farming practices have altered substantially in the time the area has been settled but neighbouring landholders still face problems with noxious weeds and other 'modern' impacts such as Melbourne Airport, the 'Thunderdome', suburban sprawl and roaming domestic animals.  
  
  
**Social history**  
Upstream from the Organ Pipes was the hamlet of Holden. There was a school in Holden; children from surrounding farms used a suspension bridge across Jacksons Creek to reach it.  
  
Mr Jim Lyon came to the Holden area in 1896, when he was five years old. In 1973 he wrote:  
  
*"We had a few cows, fowls and pigs to look after but we always found time to explore the valley of the Jacksons Creek. There are very many interesting spots along that area where my brothers and I enjoyed many hours fossicking along the cliffs and gullies, not forgetting the famous Organ Pipes and the swing bridge which crossed the creek just downstream from the Organ Pipes to reach Hall's house and orchard. Those were the days of our early life in the locality of Holden."*Records show that the Hall family lived on a property called 'Millbrook' from the 1870s until 1920. The plum trees they planted as part of their orchard are still standing downstream from the Organ Pipes, but no longer produce fruit.  
  
Between 1920 and 1922 the Hayes family lived in a bluestone house built by the Hall family near the Organ Pipes. They kept dairy cows and horses and maintained the orchard of almond, walnut, apricot and cherry plum trees. The ruins of the house and stables, and also a Jackson Bay fig planted in front of the homestead, can be seen from the Information Centre .  
  
Other residents were the Bartlett family, who lived there from 1934 to 1948.  
  
*"The land was never heavily pastured in our time as the rabbits were always bad owing to the shelter they had with boxthorn bushes and rocks,"* recalled Mr Arthur Bartlett. *"There was never a good rainfall in the area either. We also had noxious weeds such as artichoke thistles, horehound and boxthorns. On the river flat opposite the Organ Pipes we grew tomatoes for the Victorian market. We also milked about 80 cows.  
  
"When we first bought the farm, trainloads of children used to go to Sydenham Railway Station and walk the three miles to the Organ Pipes".*  
  
The last owner of the land surrounding the Organ Pipes was Mr E. A. Green. After his death the land was donated to the Crown by the trustees of the E. A. Green Charitable Foundation, and it became the Organ Pipes National Park in 1972.  
  
Mr Jack Lyale was appointed the first Ranger in Charge in 1972, remaining in the position until 1989.  
  
Since the park was opened to the public in 1972 an average of ????? visitors use the park each year. Further visitor numbers information is included in te appendices.  
  
  
**REVEGETATION**  
When Organ Pipes National Park was declared in 1972, it was a depressing sight. Head-high artichoke thistles blanketed the creek flats and slopes, horehound had spread everywhere, boxthorn bushes crowded the slopes and plains, and other weed species filled the gaps. Erosion gullies scarred the steep slopes. Rubbish was piled here and there.  
  
The National Parks Service decided to aim at restoring the area's vegetation as far as possible to its original condition. Considerable progress has been made towards this goal, and many valuable lessons learnt which have helped revegetation schemes elsewhere in Victoria.  
  
Revegetation in the sense used here is the process of changing a disturbed ecosystem to an indigenous one. (Indigenous species are those native to a particular area). The strategies used can be both direct and indirect. Direct strategies include direct seeding and planting of indigenous species as seedlings; indirect strategies may involve weed and vermin control, or the use of fire to stimulate germination of preferred indigenous species and to suppress exotic plants.  
  
A successful revegetation plan relies on indigenous plant seed being available. In 1972 there were few undisturbed remnant sites of indigenous vegetation in the park. A group of interested people, the Friends of Organ Pipes National Park, started a series of working days to clear rubbish and help eradicate weeds. They also surveyed the remaining native vegetation, both in the park and in similar areas nearby, collecting seed and striking cuttings to raise young plants. The Friends group worked with the National Parks Service to develop a revegetation plan, shown in **figure 2**, and continues to work with the Department of Conservation and Environment.   
Progress was slow but continuous, and was recognised in 1978 with the presentation of the Bronze Medal of the Robin Boyd Environmental Award, and in 1982 with the Premier's Award for landscape restoration. There is Australia-wide and even world-wide interest in the Organ Pipes project, and the work of volunteers has been vital to its success.  
  
The change from a degraded landscape to a more natural one has been recorded on slides and photographs. The slides may be viewed during your visit after consultation with park staff. The slide series develops the theme that the story of Organ Pipes is essentially one of change.  
  
Records have also been kept of all planting and direct seeding trials. It is important to monitor the progress of the revegetation program, as the rate of ecological change is very slow.  
  
The major task of re-establishing overstorey plants has been highly successful. The second stage of the revegetation program involves re-establishing the indigenous understorey species.  
  
In 1990 a seed bank and seed safe were established in the park to provide a seed source for revegetation. The seed bank is a nursery operation where indigenous plants cultivated under irrigation produce large amounts of seed. This helps reduce the costs of seed collection. A seed safe is a catalogued storage area of viable, cleaned seed, ready to plant out.  
  
After planting out seedlings are protected from rabbits by small-mesh wire netting.  
  
Young plants also need assistance to compete with other plants for resources such as light and water. Some herbicides are used to suppress introduced plants. They do not affect indigenous species as these metabolize sugars in a way that is not stopped by the action of the herbicide.  
  
  
**GEOLOGY**  
**Geological History**  
see **figure 3**  
1. Sedimentary Rocks  
  
The light coloured sedimentary rock downstream of the Organ Pipes was formed by the accumulation of rock fragments, sand, clay and mud under the sea into successive layers or sediments. These layers were eventually compressed into rock.  
  
Fossils of sea snails, sea worms and extinct floating animals called graptolites found in the rock show that it was laid down some 400 million years ago.  
  
Tremendous subterranean forces over millions of years caused gradual upheaval and sinking of the land. A fall in sea level then left the rock almost 80 metres above present sea level.  
  
2. Volcanic rocks  
  
Most rocks in the park are dark grey or brown. The Organ Pipes themselves are formed of the hard, dark rock called basalt, a volcanic rock derived from lava. Much of the basalt is pocketed with small air bubbles. The air holes are a result of steam trapped in the lava; as the steam escaped the air pockets remained.   
  
Bluestone is a dense basaltic rock often used in building and paving. Scoria is a relatively light basalt with many air holes.  
  
For about 20 million years volcanic activity was widespread in south western Victoria. The lava covering the Organ Pipes area is a recent flow, only about a million years old. The source of this lava was probably the group of low volcanic hills which may be seen about 6 km to the north of the park. These volcanoes are now extinct, or at least dormant.  
  
Although each individual lava flow was quite thin, the plain was built up by successive flows from many volcanoes over a wide area. The lava plain extends from the foot of Mount Macedon to Williamstown and Laverton and is part of the third largest lava plain in the world, that of the western district of Victoria.  
  
The flat basaltic plain is interrupted by occasional narrow and deep river valleys.   
  
The quartz and quartzite gravel found half way down from the car park to the Organ Pipes is part of a *deep lead* - an ancient stream bed buried by a lava flow, and later revealed by the downcutting of Jacksons Creek. Deep leads were mined for gold in Ballarat during the Gold Rushes.  
  
  
  
**Geological features of Organ Pipes National Park**  
The Organ Pipes   
  
The Organ Pipes are a spectacular example of basaltic columns. Rising to 20 metres in height, the Pipes are up to one metre across and are hexagonal in cross section. Very few of the columns are straight or vertical; a number of the smaller columns around the Pipes are very much tilted, some almost horizontal.   
  
The Organ Pipes were so named because of their resemblance to a pipe organ. This photograph is of the pipe organ at the Melbourne Town Hall, Swanston Street, Melbourne.  
  
The Origin of the Organ Pipes  
  
1. Valley cut into older rock.  
  
  
  
  
  
  
  
  
  
  
  
2. Lava flow fills valley, cracking vertically as it cools and shrinks.  
  
  
  
  
  
  
  
  
  
  
3. Further lava flows spread over the plain.  
  
  
  
  
  
  
  
  
  
  
  
4. Stream erosion forms a new valley and exposes cross sections of the lava flows.  
The formation of the basalt columns  
  
1. An ancient creek bed was filled with lava from a nearby volcano to a depth of 70 metres and probably more.  
  
  
  
  
  
  
  
2. The lava cooled slowly, probably over a period of several years. A crust formed on the surface, insulating the interior molten lava and protecting it from disturbance. Only with a combination of uniform lava composition, stability and slow heat loss can columns of basalt develop.  
  
  
  
  
  
  
3. As the lava cooled and solidified into basalt, it contracted. This shrinkage caused tension in the rock mass. Vertical (upward and downward) tension could be accommodated by the elastic molten rock beneath but horizontal tension could not be relieved and so the basalt cracked. The rock usually cracks in a hexagonal pattern (six sides), but columns with up to eight sides are found. (Drying mud cracks in much the same way.)  
  
  
  
  
  
  
  
4. As the basalt continued to cool, the cracks lengthened until the rock mass was divided up into columns. Columns formed downwards from near the surface, and also upwards from the old creek bed.  
  
  
  
  
  
  
  
5. The rock was still hot (about 400oC) when the columns were formed. Further contraction took place as the rock lost its remaining heat; this was relieved by horizontal cracking, causing some columns to look like stacks of Dutch cheese.  
  
  
  
  
  
6. `Organ Pipe' structures probably exist in many places under the basalt flows west of Melbourne, but they are not visible. The Jacksons Creek Organ Pipes are unusual not because columnar structure itself is rare, but because they happened to be in the right place to be revealed by the downcutting action of the stream as it formed a post-volcanic valley.  
  
  
  
  
Scoria Cone  
  
The carpark at Organ Pipes National Park is on the remains of a very weathered scoria cone. At about the same time as the larger volcanoes to the north were producing lava (800,000 to a million years ago) this cone ejected molten rock in a series of explosions, producing scoria. Scoria is brownish in colour and is filled with air-pockets.  
  
  
Rosette Rock  
  
Five hundred metres upstream of the Organ Pipes, overhanging the northern bank of the stream, is a large outcrop of basalt with a radial array of columns resembling the spokes of a giant wheel. It was formed by the radial cooling of a pocket of lava, probably in a spherical cave formed from an earlier lava flow.  
  
  
Tessellated Pavement   
  
On the valley floor about 250 metres upstream of Rosette Rock is a basalt outcrop which has a tiled or mosaic-like appearance. It is another area of columnar basalt, but instead of the vertical faces being visible as at the Organ Pipes, the horizontal faces are visible - you can walk and climb over them. The columns tend to be hexagonal, but many have sides of unequal length and there may be from four to eight sides on each column.  
  
  
**Soils**(**see figure 5**)  
  
Organ Pipes National Park has the reddish volcanic soils generally found on the Keilor Plains, and also others derived from rock types which underlie the basalt and which are exposed only in valleys.  
  
Complete soil profiles are confined to flat or gently-sloping areas. Elsewhere, soil horizons are either unable to develop, because of steepness, heat or dryness, or have been degraded. Much of the surface area of the park therefore consists of poor shallow rocky soils (lithosols), or of bare rock.  
  
**Soil Types**  
1. Zonal soils (soils with distinct horizons based on texture, colour or structure)   
  
a) Red brown earths  
  
These are the dominant zonal soils in the Park. They have low permeablility and high capacity to hold water and as they occur mostly in flat areas, such as on the basalt plains, they become waterlogged. In summer they set hard and crack.  
  
b) Grey duplex soils  
  
These soils only occur over Palaeozoic rocks, and so are not common in the park. Although they do not waterlog or set hard or crack, plant growth is generally sparse, probably because the topsoil has been eroded.  
  
  
  
  
c) Uniform medium loams  
  
Occurring on steep south facing slopes over basalt, these soils are well drained but shallow and prone to slumping, especially where rabbits have been active.  
  
  
2. Azonal soils (soils in which horizons cannot be distinguished)  
  
a) Alluvial soils  
  
These vary from clay loams to gravels and include the most fertile soils in the park. With their significant sand content, they are not subject to water logging, but because they are occasionally flooded by Jacksons Creek natural vegetation on them is restricted to tolerant species such as River Red Gum and River Bottle-brush.  
  
b) Colluvial soils   
  
These consist of coarse angular particles at the base of steep slopes, are dark grey to dark brown in colour, and where they are stable and sheltered can support a fairly wide variety of vegetation.  
  
c) Lithosols  
  
Shallow and stony, these reddish brown soils occur over basalt on steep slopes and frequently supported infestations of boxthorn, although indigenous Lightwoods (*Acacia* *implexa*) now thrive on them.  
  
Other lithosols are found on prebasaltic sands and gravels near the foot of Grey Box Gully and also on the lower slopes of the Jacksons Creek valley.  
  
**Soil problems**  
Most of the Park's soils have been altered and degraded by human activity over the past 150 years. Erosion, rabbits and weeds have all taken their toll. In addition, the soils have natural disadvantages such as their water holding properties, and present problems for plant growth.  
  
**Erosion**  
a)        Sheetwash  
  
This is the most common form of erosion, affecting nearly all the slopes in the park. Removal of the original vegetation is the prime cause, but weed species have a bad effect also. Boxthorn, for instance, draws out moisture from the soil and makes it still more prone to erosion.   
  
The lithosols on basalt in the park were probably once soils a metre or more deep.   
  
Sheetwash is being controlled by eliminating rabbits and weeds and by the revegetation of slopes.  
  
b)        Gullying   
  
Gullying occurs along most drainage lines down the slopes. Its causes and control are the same as for sheetwash.  
  
c)        Slumping  
  
Slumping is a problem on steep south-facing slopes in soils on basalt or Palaeozoic rocks, and is caused by rabbit burrowing.  
  
d)        Cracking  
  
The problem here is that cracks expose the roots of young plants directly to air and the summer sun, resulting in death.   
  
Before European settlement, the soils had a higher humus content which would have reduced the incidence and effects of cracking. In the replanting program, mulching with scoria, wood shavings and other material helps overcome the problem, and also conserves moisture and suppresses weeds.  
  
e)        Waterlogging  
  
Although annual rainfall over the basalt plains is low, soils there have always been subject to waterlogging, the result both of their structure and the low relief. This helps to explain why in a natural state the plains supported mainly grasses and herbs, with most trees confined to valleys and slopes.  
  
f)        Alkalinity  
  
Calcium and magnesium carbonate beneath the red brown earths of the plains make these soils highly alkaline, which can inhibit or prevent the growth of some plant species.  
  
  
**The future**  
  
The degradation of the soils in the park cannot be completely reversed, but with the removal of rabbits and weeds and the re-establishment of native vegetation it has been slowed. This allows the soils to regenerate under a vegetation cover very similar to the original one.  
  
  
**ECOLOGY**  
  
Organ Pipes National Park is not just an 'island'. The Upper Maribyrnong Valley is a wildlife corridor with a continuous system of habitats. It provided for the movement of flora and fauna and is particularly important to connect isolated pockets (fauna refuges) of native bushland and grassland.   
  
Jacksons Creek at Organ Pipes National Park, provides some of the best riparian and instream fauna habitat in the Greater Melbourne area.  
  
There are three distinct habitat types represented at Organ Pipes National Park: grassland habitat, riparian habitat and valley wall habitat.  
  
  
**Grassland habitat**  
Plants in grasslands are adapted to living in shallow soils with low rainfall, and have to tolerate great variations in temperature throughout the year. The plant species provide shelter and food for various animals, which also display specialised adaptations to their environments.  
  
The amount of grassland remaining in Victoria has been significantly reduced by European settlement. Only 0.1% of the origianl natural grassland remains in the Melbourne area, and less than 150 ha has been reserved for protection. No more than 5% of the State's native grassland communities remain unmodified.   
  
Australian native grasslands, where *Themeda* (Kangaroo Grass) and *Danthonia* (Wallaby Grasses) are the dominant species, are fragile ecosystems when confronted by the cloven-hoofed grazing animals, which significantly compact the soil, and mowing, which slows the rate of natural regeneration. The reduced incidence of fire, a `natural' occurrence from lightning strikes and Aboriginal land management, has also affected grassland ecosystems. Fire promotes regeneration of native grasses, as they are well adapted to fire cycles, and at the same time inhibits introduced grass species.  
  
Grasslands provide a niche (ecological role) for particular mammals which exploit the seasonal abundances of food during winter and spring. These mammals have adaptations to reduce water loss, such as modified excretory systems, and use the ample amount of dew formed most mornings. They seek nesting sites in fallen grasses and under rocks to avoid predation.   
  
Mammals formerly found in the Organ Pipes area included Short-tailed Dunnarts, Eastern Barred Bandicoots, antechinus ("native mice") and quolls (native tiger cats).  
  
  
**Riparian habitat**  
The habitat zone surrounding the creek is an oasis in a dry landscape. Water is a limiting factor in the Australian environment; the creek zone is an important wildlife corridor as well as a habitat in its own right. Mammals like kangaroos and wallabies, as well as waterbirds and other aquatic species such as fish and platypuses, use this habitat.  
  
There is a higher diversity of species in this riparian zone than elsewhere, as it is the junction between two distinct habitats (i.e. an **ecotone**). Species found in both adjoining zones can be found in an ecotone.  
  
Many species of freshwater invertebrates are found in the creek. Water plants are abundant and there is a variety of waterbirds.  
  
In the riparian zone, temperature extremes during the day and throughout the year are modified by the presence of water. These easier living conditions also contribute to an increase in the diversity of species found in this zone. However, the zone is subjected to violent disruption during flooding of Jacksons Creek, which may occur up to six times each year. The destructive effects of flooding, such as loss of immature plants and loss of soil, are in some ways offset by the dumping of fresh topsoil and the immigration of aquatic species and new seed material from further upstream.  
  
The riparian zone is sensitive to any changes in land use practices upstream. Water quality is affected by fertilisers, agricultural run-off and seepage of effluent. These factors can have dramatic and immediate effects on plants and animals.   
  
This illustrates the importance of seeing the park in a broader context. It cannot be studied or managed in isolation, but must be considered in relation to what is happening in the surrounding land and the catchment of Jacksons Creek.  
  
  
**Valley wall habitat**  
The steep-sided valley walls with their basalt caps and comparatively soft sedimentary rock sides a habitat for other specialised plants and animals. The valley walls provide conditions not found on the plain, such as suitable sheltered places for trees to grow. Trees for nest sites are a rare commodity in a grassland community and birds compete for them. Some species, such as falcons, use cliff faces for nesting sites instead.  
  
The area is sensitive to erosion as the valley sides are steep and dry. If vegetation is removed, rain leads to severe landslips and erosion. The harsh environment supports a reduced diversity of plants and animals.  
  
Exposed rock surfaces weather quickly, providing a source of new soil for the riparian habitat.  
  
  
  
**PLANTS**  
The Organ Pipes National Park is an example of a recreated basalt plain grassland. Some of the significant species include:  
 *Chloris truncata*-Windmill Grass. Widespread summer growing native species.  
  
  
*Bothriochloa macra*-Redleg Grass. Plants turn red or purplish making them conspicuous in late summer.  
  
  
*Danthonia species*-Wallaby grasses. Most important native pasture grasses. Can resist frost, are drought tolerant and persist despite heavy grazing. Grow well after summer rain.  
  
  
*Dicanthium sericeum*-Silky or Queensland Bluegrass. Valuable component of native pasture.  
  
  
*Themeda* *triandra*-Kangaroo Grass. High protein grass, good for drought fodder for domestic stock too, as it grows through the summer.  
  
  
*Rutidosis* *leptorrhynchiodes*-Button Wrinklewort. An endangered species Australia wide.  
  
  
*Callitris glaucophylla*-Murray Pine. This species has been significantly affected by European settlement. Some trees in the park are thought to be over a hundred years old, probably the closest natural stand of *Callitris* to Melbourne and in the southernmost part of its range.  
  
  
Native grass species are specially adapted to the dry, windy conditions of the plains. Water is transpired - lost through pores in the leaves of all plants. Grasses have leaves shaped to reduce the loss of water by reducing the amount of available surface area. This enables grass species to succeed in dry windy places.  
  
The fascinating seeds of these grasses are also specially adapted. They drop from the plant in the dry time of the year. The awn or spindle-like tail attached to each seed curves when exposed to moisture in the air, so that the head faces downwards, and the tail twists, drilling the head about two centimetres into the soil. When the soil is moist and warm the seeds germinate. Native grasses are adapted to fire but not to persistent slashing or mowing. This is because cut grass does not expose bare earth for the ripe seed to fall on and drill into.  
  
The indigenous trees of the basalt plains also have interesting adaptations to their environment. She-oaks *(Allocasuarina verticillata)*, for instance, have leaves reduced to tiny scales to decrease transpiration. Their branchlets have a waxy coating to protect them against frost, wind and salt.  
  
  
**ANIMALS**  
  
**Mammals**  
  
The mammals population at Organ Pipes National Park include Brush-tailed and Ring-tailed Possums, Eastern Grey Kangaroos, Swamp Wallabies, Echidnas, Sugar Gliders, Platypus, seven species of bats and Water Rats. Introduced animals include rodents, rabbits, foxes, dogs and cats.  
  
Sugar Gliders (*Petaurus breviceps*) are small possums which eat nectar, sap and insects. They live in family groups of six to twelve individuals sharing a territory and a nest. They are nocturnal and aggressively defend a territory from gliders belonging to other family groups and from bigger possums. Each territory may have several nests. Groups are found during the day curled up in a nest of leaves in a hollow tree.  
  
Sugar Gliders carry their young (usually two) in a pouch. They leave the pouch at two months but stay in the nest until they are about four months old.  
  
The most striking thing about Sugar Gliders is their method of travelling from one tree to another. The gliders launch themselves from a tree, extending their limbs and the membrane between the front and rear limbs. The membrane acts as a parachute, billowing to slow the gliders' fall. Once the animal lands on the next tree it may bound up the trunk or feed on the branch it has landed on.  
  
Sugar Gliders were found in the Organ Pipes area until 1916. In 1989 a re-introduction program was started. This was a joint project between the Friends of Organ Pipes National Park and park staff. As the young trees in the area do not provide suitable hollows for nesting, nest boxes were fixed to trees. A pioneer population of 13 individuals trapped at Toolern Vale was then introduced.   
  
Each year the population is monitored by trapping gliders, checking their health and releasing them. The population is increasing and the original pioneers have lived past their expected two years life. The increase in population numbers and continued good health of gliders indicates that conditions for their survival such as food sources and available shelter are adequate.  
  
Swamp Wallabies and Eastern Grey Kangaroos are making their own way back to the park as the quality of the habitat improves. Koalas are found at Diggers' Rest about 7km away, and given time they too will return to the park. There are many reported sightings of platypuses.  
  
  
**Birds**  
Grasslands provide habitat for a range of birds. Flocks of finches feed on ripe grass seed, birds of prey patrol the plains for small mammals, and quail abound.   
  
The Plains Wanderer, a small quail-like plover that probably occurred in the area is now rare over most of the south-east part of its range because of the reduction in available natural grasslands.  
  
Some of the easiest birds to see in the park are the birds of prey. Little Eagles, recognisable by the light 'W' pattern under the wings, are often seen soaring above the creek valley, and Black-shouldered Kites nest in trees on the valley wall.  
  
Bush birds can be readily seen in the picnic grounds. Superb Blue Wrens feed on small insects and seeds, the males striking in their blue breeding plumage. Males generally moult into `eclipse' plumage that resembles female plumage after breeding, but older males may remain blue all year. The birds live in small groups of up to eight birds, breeding co-operatively: that is, the offspring from the previous year stay with their family, helping to raise the new brood. Wrens are quite brave and will come close to you if you stay still.  
  
  
**Reptiles**  
Native grasslands are good places for reptiles, "solar powered" animals that are well suited to the open exposed plains environment. Rocky basalt outcrops and grass tussocks are a perfect habitat for reptiles, providing places to hide with good heat retaining features. Native reptile species are fairly numerous at Organ Pipes National Park. Blue-tongued Lizards and skinks are common, and Stumpytailed Lizards are also present.   
  
Brown and Tiger Snakes may be seen in the Park. Both are venomous, but snakes are shy creatures and will not attack people unless provoked. (Remember that snakes, like all native animals, are protected in national parks).  
  
The park has been earmarked as a possible release site for a population of the Legless Lizard (*Delma impar*), an endangered species which is being bred at Royal Melbourne Zoo. The lizard is still found in a few native grasslands near Melbourne.  
  
  
**PARK MANAGEMENT ISSUES**  
  
In Victoria the *National Parks Act 1975* established statutory requirements for the preparation of Plans of Management. The Act requires the Director of National Parks to prepare a Plan of Management for each park under his control. Parks are divided into a number of management zones - for instance, the conservation zones at Organ Pipes which are temporarily closed to the public.  
  
The main purpose of park management planning is to define objectives and establish ways of achieving them. Although there is currently no approved Management Plan for Organ Pipes, working objectives have been agreed on and much has been achieved since the park was proclaimed in 1972. The main strategy has been to protect the few natural resources and to minimise negative affects on them. Management of a disturbed environment requires a high level of active management.  
  
The replanting of locally indigenous species continues and has expanded as areas have been added to the original park. The riparian vegetation is now `self reproducing' but many of the replanted species require monitoring to determine whether they can maintain themselves without ongoing care and management.   
  
Most of the invasive noxious weeds have been brought under control, but now other weeds, notably introduced grasses, present major management problems. Tall, dried-off grasses are a fire hazard, which leads to extensive slashing and mowing. This continual interference prevents re-establishment of the native field layer.   
  
A works program is developed every year, taking account of the gradual change from a degraded ecosystem to a near natural ecosystem.  
  
Work to be done each year in the park includes:  
  
**1. Weed control.**  
A variety of weed control methods is used at Organ Pipes National Park, following assessment of the types and characteristics of particular weeds, the effects of weed control and the funds and staff available. Weed control strategies aim at minimising disturbance and preventing the establishment of "new weeds" which might need more toxic herbicides to control them. Control methods used in the park are :

1. Mechanical methods such as pulling weeds out by hand, grubbing out with tools, or collecting seed heads.

\*        Chemical methods such as spot spraying with herbicides.

1. Ecological methods such as biological control, (e.g. rust fungus for blackberries) or the selective cultivation of desirable species so that the weed species are out-competed for nutrients, light and water.

\*        Some use of fire.  
  
  
  
**Noxious weeds**  
Noxious weeds are plants that are seen as a threat to agriculture or primary industry. An Act of Parliament is needed to declare a weed noxious. Land managers are then responsible for the removal of these species from their land. When the park was first declared most of the vegetation was weed species, including many noxious weeds. Noxious weeds still grow in the park and one of the management aims for the area is to eliminate these species. Of course the park cannot work at this in isolation; the co-operation of neighbouring landholders is needed to control noxious weeds both in the park and on their own properties.  
  
The main species of noxious weeds at Organ Pipes are:  
  
Serrated Tussock (*Nassella trichotoma*). This grass is a threat to grazing animals as the tussock is indigestible and forms a ball in the animal's stomach, preventing it from being able to absorb nutrients and leading to eventual starvation. Serrated Tussock was introduced to Australia from Uruguay and Argentina.  
  
In the park this plant is a problem because each mature tussock can produce 100,000 seeds per plant per year. This rate of reproduction creates considerable competition for native grasses and herbs.  
  
Artichoke Thistle (*Cynara cardunculus*). A problem in the park because of the amount of space each plant whorl occupies. The thistle is an aggressive competitor with native species for nutrients, light and water. It is also very invasive, many thousands of seeds being released from each plant. Many visitors to the park remember the former sea of thistles at the Organ Pipes and are impressed by the degree of control that has been achieved.  
  
African Boxthorn (*Lycium ferocissimum*). Boxthorn was introduced to Australia from Southern Africa for hedgerows and windbreaks. Boxthorn provides excellent habitat for rabbits to burrow under and it draws most of the moisture from the soil. Boxthorn is thought to prevent other species from regenerating by an alleopathic mechanism, `poisoning' the soil so that other species cannot grow.  
  
  
**Environmental weeds**  
Environmental weeds are species that are not declared under the Noxious Weed Act but that cause problems to desirable plants because of their size, invasive nature or low food value. Environmental weeds can be garden escapees or can be native to Australia.  
  
Bridal Veil Creeper or Asparagus Weed (*Myrsiphyllum asparagoides*) is a potential threat at Organ Pipes because of its invasive nature.  
  
Toowoomba Pasture Grass (*Phalaris tuberosa*) was originally introduced into the park to help control erosion. It is now considered an environmental weed as it prevents the re-establishment of native ground covers by out-competing native species for light and water.  
  
**2. Vermin control**  
Feral animals, or vermin, are unwelcome in a national park because of the disturbance they create in the park's ecosystems. At Organ Pipes the main feral animals are rabbits, foxes, cats and dogs. Roaming domestic dogs can also be a menace to native wildlife and can disturb visitors.   
Rabbits cause massive erosion problems and prevent the natural regeneration of plants. Their feeding habits make it hard for plants to grow past a very young age and this in turn leads to sheetwash erosion as there is no plant matter holding the soil together.  
  
The main methods of rabbit control are fumigation of burrows, harbour destruction, use of rabbit exclusion fencing and selective poisoning.  
  
Foxes, cats and dogs cause problems by preying on smaller native species. They are mostly controlled by trapping.  
  
**3. Rehabilitation of degraded land**  
This part of the park management is the easiest for most visitors to identify. Since 1972 a major revegetation program has been in operation. The results of this program are clear: erosion has been halted in most of the park, local indigenous plant species have been reintroduced, and native animals have returned or are returning to the park.   
  
The park's seed bank and nursery provide tube stock for planting out seedlings and for direct seeding. Direct seeding is scattering a mix of seed over a suitable area and limiting negative growth factors such as rabbits and weeds. Direct seeding is cheaper than growing tube stock and planting it out.   
  
It is particularly important to have a seed bank because many of the remaining indigenous sites near the park are under threat from development. This may lead to a reduction in the genetic diversity of rare grassland species.  
  
  
**4. Maintenance and improvement of visitor facilities (toilets, picnic grounds, walking tracks)**  
Part of the park's operating budget is spent each year on the provision of visitor facilities. Rubbish is collected, toilets cleaned and picnic grounds and walking tracks maintained. Many schools visit the park during the week and often request the assistance of staff.  
 **The work of park staff**  
The Park has three rangers and three Construction and Maintenance workers (C & Ms). Their task is to maintain and improve the quality of the land held in trust for the people of Victoria.  
  
The main responsibilities of the rangers are to manage the park by deciding the works priorities and supervising the C&Ms. They also advise and assist visitors, and ensure that park regulations are obeyed. Rangers often have other Crown land to manage; in the Organ Pipes area this includes remnant native grasslands on the Keilor Plains at St Albans, Laverton and Derrimut. Rangers are classified as Technical Officers. They receive formal training and are expected to be competent in land management.  
  
The duties of a C & M are extremely varied but include all the labouring work done in the park. The day to day duties depend on the season and particular priorities.  
  
A successful work experience program at Organ Pipes National Park which introduces students to all types of park work.  
  
  
This extract from a ranger's diary illustrates the type of work done in the park.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | \* | \* | \* | \* | \* |

*There isn't a typical day because rangers here have a great variety of jobs to do which differ according to the season and even according to the day of the week. No two days are the same. There are three rangers here and the Park is staffed 365 days a year so we take turns at weekend duty. The working day begins at about 7.50 am and continues until 4.30 or 5.00pm.  
  
  
8.00 - 8.30 am*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  | *Discussed with the other ranger on duty, the three maintenance staff and the two year 10 work experience students the tasks we needed to tackle during the day:* |

1. *-repairing the rabbit proof fence and gate*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  | *-* | *clearing rubbish from the bins* |
|  |  |  |  | *-* | *weed control work, spraying artichoke thistle in the south end of the park* |
|  |  |  |  | *-* | *revegetation work, planting tube stock along the creek* |

*�*

*8.30-10.50 am*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  | *Worked on the revegetation program, planting tube stock. Also checked an area where seed had been planted the year before and recorded details of the plants growth* |
| *11.00 am* |  |  |  |  |
|  |  |  |  | *Gave a talk to a school group* |

*11.30 am*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  | *Discussed with the maintenance staff the problem they had just encountered. They had begun weed control work on the other side of the creek. On their return they found that the creek level had risen and the landcruiser only just made the crossing. The afternoon's work in the area beyond the creek was not going to be possible. Jobs on this side of the creek would be done instead.* |

1. *0-12.30 pm*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  | *Lunch and took two school bookings by phone.* |

*12.45 pm*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  | *Left park and drove to the divisional office for a meeting. At the meeting we discussed plans for fighting bushfires in national parks. All rangers and C & Ms are on standby to fight fires in national parks throughout the State during the summer.* |

*3.45. pm*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  | *Returned to the park for a meeting with the Friends group to work out plans for including smaller herbaceous plants in the revegetation program.* |

*4.45 pm*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  | *Checked the pamphlet box to see if it needed filling. Locked park gate and went home.* |

**SOME SUGGESTED ACTIVITIES FOR SCHOOLS**  
  
**Earth Science**  
*Activities at Organ Pipes*  
  
Rocks as well as plants and animals are protected in national parks and cannot be collected without a written permit.  
  
Remember that rocks and minerals similar to those present within the park can be found almost anywhere on the huge lava plain north-west of Melbourne.

1. Look for different colours and textures of soil in different places within the park, at the carpark, along the track, near Jacksons Creek. Using the information in the Teacher's Guide to help you, explain the variations.

1. Examine profiles of the soil along the track down to the Organ Pipes and near the Tessellated Pavement. Measure the depth of each horizon, subsoil, clay and bedrock, and compare the two.

1. Look for examples of various types of erosion, such as soil creep, gully erosion and sheet erosion. What can be done to control these problems? Does the establishment of walking tracks cause or reduce erosion?

1. What has caused soil erosion in this area in the past and why is it continuing?

*Activities at school*  
  
These could be tried either before or after the excursion.

1. Make 'fossils' of leaves or shells by embedding them in plaster or clay. Both positive and negative prints can be made.

1. Demonstrate folding, faults and cross sections by laterally compressing horizontal layers of different coloured clays.

\*        Rate of cooling

1. The formation of large crystals in solutions which cool slowly can be demonstrated by preparing crystals in the classroom.

1. Prepare a saturated copper sulfate solution. (The best shaped crystals occur when there is some dilute sulfuric acid in the solution.)

1. Using three containers the same size and shape with equal amounts of solution in each, -

|  |  |  |
| --- | --- | --- |
|  | . | insulate one (the slowest cooling), |
|  | . | leave one to cool at room temperature (middle rate of cooling), |
|  | . | sit one in ice or cold water bath (the fastest rate of cooling). |

1. When crystals form in all three solutions, measure or weigh or trace around to compare size.

\*        Making valleys and simulating erosion  
  
        Make a landscape in a box

|  |  |  |
| --- | --- | --- |
|  | - | include rocks and sand |
|  | - | pour water on the landscape simulating a stream causing erosion. |
|  | - | watch development of landscape |

        Plaster could be used to represent lava flow

1. Guess the weight of rocks without touching them. (Scoria with many holes is much lighter than other volcanic rocks).

**Ecology**  
  
There are many areas suitable for surveying by **transects**.  
  
Transects can provide a variety of information about the area, but please remember that you need the permission of the senior ranger to walk off the made tracks.  
  
A line transect can show the change between two vegetation zones and provide quantitative data about the vegetation in an area. Relative density of a species can be calculated, and frequency and abundance estimates made, although the latter two are not as reliable as when calculated using quadrat sampling.

1. Use a **sampling method** to establish an index of diversity or variation by counting the number of individuals and species of introduced and native plants in a variety of different areas: hilltops, alluvial flats and valley walls. Define a number of vegetation associations on the basis of the collected data. Establish to what extent these zones are caused by environmental factors and to what extent by chance.

1. Describe the **distribution and density** of one particular plant species throughout the park.

1. Assess a number of different plant species and describe their **adaptations** to their environment. Examine the seed of each plant to find out its special adaptations for dispersal.

1. Estimate the number of seeds produced by a representative native species and an introduced one. Assuming an establishment success of 1% draw graphs showing the **rate of spread**. What does this show about competition between native and introduced species?

**Pondlife**  
Jacksons Creek contains a diverse invertebrate fauna which can be sampled using dipnets. Magnifying glasses and field guides will help with identification. Small vertebrates are also found.

1. A simple dipnet can be made using a wire coat hanger and a pair of pantyhose. The mesh of the pantyhose is small enough to catch anything bigger than a small ostrocod.

1. The quality of water affects the type of organisms able to live in it. Other factors influence where different species are found

1. Flow rate can be measured using a known length of string tied to a floating object, and a stop watch.

1. The volume of flow can be calculated by using the following formula:

|  |  |  |
| --- | --- | --- |
|  |  | *r* = *wdal* |
|  |  | *t* |

        where

|  |  |  |
| --- | --- | --- |
|  |  | *t* = the time in seconds required for the float to travel a measured section of the stream. |

|  |  |  |
| --- | --- | --- |
|  |  | *l* = the length in metres of the section of the stream. |

|  |  |  |
| --- | --- | --- |
|  |  | *w* = the average width of the stream (metres) |

|  |  |  |
| --- | --- | --- |
|  |  | *d* = the average depth of the stream (metres) |

|  |  |  |
| --- | --- | --- |
|  |  | *a* is a constant *a* = 0.8 if the stream bed is rubble or gravel and *a* = 0.9 if the stream bed is quite smooth. |

1. A cross sectional profile of the stream may explain certain variations in temperature, velocity and types of life across the width of the stream. This profile may be obtained by suspending a string across the stream and recording, at suitable intervals, the depth of the stream, type of vegetation, and type of bottom material. The profile can be reconstructed on paper.

1. Habitat zones within the creek can be established by sampling in a variety of areas and recording the species present.

**Other activities**  
  
Communicating in prose  
  
Use the outdoors to stimulate free expression and imagination. Here are a few suggested topics.

1. Pretend that you are a butterfly, an ant, a lizard, or a bushfly. Look at the world through your new eyes. What do you see? What do you hear? What do you do? Pretend you are in a rainstorm. How do you feel?
2. Imagine yourself as an Aborigine, 200 years ago. Where would you get your food? How would you live here? How would you build a shelter? (The river flats of Jackson's Creek were, in fact, a favourite camping ground of the Aborigines. The remains of Green Gully Man, of archaeological fame, were found a few miles downstream from the Organ Pipes). You may have to explain to the class that the landscape was quite different at the time: wombats, kangaroos, dingoes and occasionally koalas, as well as smaller marsupials, were to be found.
3. Pretend that you are an early settler. You have just come from another land where seasons are reversed and the animals and plants were very different. What are your reactions to your new land? History teachers could use this opportunity to give a brief history of the locality.
5. Impressions:
6. Find something in the park which is increasing in number and something which is decreasing in number. Can you prove it? Are the increases good or bad?
7. Make a list of things which appear to you to be impossible to count. What makes things impossible to count? How might it become possible to count them?
8. Find a series of natural events such that the first is related to the second, the second to the third and so on.
9. Describe objects that don't look alike but are similar in some way.
10. Discover a million of something and prove it. What are your feelings about a million of something?
11. Find positive evidence that something natural has happened. What is 'natural'? Are man-made changes natural?
12. List things in the environment around you which make you feel happy, sad, or indifferent. List things around your school and home environment which make you feel happy, sad or indifferent.
14. Expression with Poetry

Often poetry can describe far more adequately than prose. One of the most beautiful ways of expressing a thought or feeling, or describing an image, is Haiku, a Japanese form of poetry. It does not take a poetic genius to write Haiku, but it does take sincerity. Here are a few examples:

|  |  |  |
| --- | --- | --- |
|  |  | Bitter morning: |

        Sparrows sitting

|  |  |  |
| --- | --- | --- |
|  |  | Without necks. |

|  |  |  |
| --- | --- | --- |
|  |  | Sometimes the oddest thing, |

        Like this orange pip,

|  |  |  |
| --- | --- | --- |
|  |  | Begs not to be thrown away. |

|  |  |  |
| --- | --- | --- |
|  |  | If ever we should try, |

        Neither you nor I

|  |  |  |
| --- | --- | --- |
|  |  | Could make a flower. |

|  |  |  |
| --- | --- | --- |
|  |  | This garter snake |

        Goes in and out of the grass

|  |  |  |
| --- | --- | --- |
|  |  | At the same time! |

|  |  |  |
| --- | --- | --- |
|  |  | Simply alive, |

        Both of us, I

|  |  |  |
| --- | --- | --- |
|  |  | and the poppy. |
|  |  |  |  |  | (Baishitsu 1767-1852) |

A Haiku poem has three lines and only one thought is expressed. The classical Haiku poem is based on 17 syllables, in the pattern 5-7-5. This need not be strictly followed; none of the examples given fits the 5-7-5 pattern. A Haiku poem can be accompanied by an illustration.  
  
Here is a local example:

|  |  |  |
| --- | --- | --- |
|  |  | Soaring upwards |

        Eternally silent!

|  |  |  |
| --- | --- | --- |
|  |  | The Organ Pipes. |

Gould League activities

1. complete list of Gould League publications, including field guides and with environmental activities, is available from:

Gould League of Victoria Inc., 67 High Street, Prahran (P O Box 446, Prahran, Victoria ) Tel. (03) 510 1493 Fax (03) 521 1217.



**Further Reading**  
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**Appendices**  
  
**Bird list.**  
**Non Passerines**

|  |  |  |
| --- | --- | --- |
| Australasian Grebe |  | *Tachybaptus novaehollandiae* |
| Little Pied Cormorant |  | *Phalacrocorax melanoleucos* |
| Great Cormorant |  | *Phalacrocorax carbo* |
| Australian Pelican |  | *Pelecanus conspicillatus* |
| Great Egret |  | *Egretta alba* |
| White-faced Heron |  | *Ardea novaehollandiae* |
| Pacific Heron |  | *Ardea pacifica* |
| Nankeen Night Heron |  | *Nycticorax caledonicus* |
| Australasian Bittern |  | *Botaurus poiciloptilus* |
| Yellow-billed Spoonbill |  | *Platalea flavipes* |
| Straw-necked Ibis |  | *Threskiornis spinicollis* |
| Australian Shelduck |  | *Tadorna tadornoides* |
| Pacific Black Duck |  | *Anas superciliosa* |
| Australian Grey Teal |  | *Anas gracilis* |
| Brown Goshawk |  | *Accipiter fasciatus* |
| Whistling Kite |  | *Haliastur sphenurus* |
| Little Eagle |  | *Hieraaetus morphnoides* |
| Wedge-tailed Eagle |  | *Aquila audax* |
| Black-Shouldered Kite |  | *Elanus notatus* |
| Brown Falcon |  | *Falco berigora* |
| Australian Kestrel |  | *Falco cenchroides* |
| Peregrine Falcon |  | *Falco peregrinus* |
| Stubble Quail |  | *Coturnix pectoralis* |
| Dusky Moorhen |  | *Gallinula tenebrosa* |
| Masked Lapwing |  | *Vanellus miles* |
| Silver Gull |  | *Larus novaehollandiae* |
| Common Bronzewing |  | *Phaps chalcoptera* |
| Feral Pigeon |  | *Columba livia* |
| Spotted Turtle-Dove |  | *Streptopelia chinensis* |
| Galah |  | *Cacatua roseicapilla* |
| Sulphur-crested Cockatoo |  | *Cacatua galerita* |
| Eastern Rosella |  | *Platycercus eximius* |
| Crimson Rosella |  | Platycercus elegans |
| Red rumped Parrot |  | *Psephotus haemotonotus* |
| Horsefield's Bronze-Cuckoo |  | *Chrysococcyx basalis* |
| Laughing Kookaburra |  | *Dacelo novaeguineae* |
| Sacred Kingfisher |  | *Halcyon sancta* |
| Rainbow Bee-eater |  | *Merops ornatus* |
| Barn Owl |  | *Tyto alba* |
| Southern Boobook |  | *Ninox novaeseelandiae* |
| White-throated Needletail |  | *Hirundapus caudacutus* |

**Passerines**

|  |  |  |
| --- | --- | --- |
| Welcome Swallow |  | *Hirundo neoxena* |
| Skylark |  | *Anthus arvensis* |
| Richard's Pipit |  | *Anthus novaeseelandiae* |
| Brown Songlark |  | *Cinclorhamphus cruralis* |
| Black-faced Cuckoo-shrike |  | *Coracina novaehollandiae* |
| Blackbird |  | *Turdus merula* |
| Flame Robin |  | *Petroica phoenica* |
| Scarlet Robin |  | *Petroica multicolor* |
| Golden Whistler |  | *Pachycephala pectoralis* |
| Rufous Whistler |  | *Pachycephala rufiventris* |
| Grey Fantail |  | *Rhipidura fuliginosa* |
| Rufous Fantail |  | *Rhipidura rufifrons* |
| Willy Wagtail |  | *Rhipidura leucophyrs* |
| Australian Reed Warbler |  | *Acrocephalus australis* |
| Golden-headed Cisticola |  | *Cisticola exilis* |
| Superb Blue Wren |  | *Malurus cyaneus* |
| White-browed Scrubwren |  | *Sericornis frontalis* |
| Striated Thornbill |  | *Acanthiza lineata* |
| Yellow Thornbill |  | *Acanthiza nana* |
| Yellow-rumped Thornbill |  | *Acanthiza chrysorrhoa* |
| Brown Thornbill |  | *Acanthiza pusilla* |
| Red Wattlebird |  | *Anthochaera carunculata* |
| White-naped Honeyeater |  | *Melithreptus lunatus* |
| Brown-headed Honeyeater |  | *Melithreptus brevirostris* |
| Yellow-tufted Honeyeater |  | *Lichenostomus melanops* |
| Yellow-faced Honeyeater |  | *Lichenostomus chrysops* |
| White-plumed Honeyeater |  | *Lichenostomus penicillatus* |
| Fuscous Honeyeater |  | *Lichenostomus fuscus* |
| New Holland Honeyeater |  | *Phylidonyris novaehollandiae* |
| Eastern Spinebill |  | *Acanthorhynchus tenuirostris* |
| Silvereye |  | *Zosterops lateralis* |
| Mistletoebird |  | *Dicaeum hirundinaceum* |
| White-fronted Chat |  | *Ephthianura albifrons* |
| Spotted Pardelote |  | *Pardalotus punctatus* |
| Striated Pardelote |  | *Pardalotus striatus* |
| Red-browed Firetail |  | *Emblema temporalis* |
| Euopean Goldfinch |  | *Carduelis caruelis* |
| House Sparrow |  | *Passer domesticus* |
| Common Starling |  | *Sturnus vulgaris* |
| Common Mynah |  | *Acridotheres tristis* |
| Magpie-lark |  | *Grallina cyanoleuca* |
| Australian Magpie |  | *Gymnorhina tibicen* |
| Little Raven |  | *Corvus mellori* |
| Australian Raven |  | *Corvus coronoides* |

**MAMMAL LIST**

**Monotremes**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Platypus |  |  |  | *Ornithoryhncus anatinus* |
|  | Short-beaked Echidna |  | *Tachyglossus aculeatus* |  |  |

**Marsupials**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Common Ringtail Possum |  | *Pseudocheinus peregrinus* |
|  | Sugar Glider |  |  |  | *Petaurus breviceps* |
|  | Common Bushtail Possum |  | *Trichosurus vulpecula* |  |  |
|  | Eastern Grey Kangaroo |  | *Macropus giganteus* |  |  |
|  | Swamp Wallaby |  |  | *Wallabia bicolor* |  |

**Placental Mammals**  
  
        White-striped Mastiff

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Bat |  |  |  |  | *Tadarida australis* |
|  | Lesser Long-eared Bat |  | *Nyctophilus geoffroyi* |  |  |  |
|  | Gould's Wattled Bat |  |  | *Chalinolobus gouldii* |  |  |
|  | Chocolate Wattled Bat |  | *Eptesicus vullurnus* |  |  |  |
|  | Large Forest Bat |  |  | *Eptesicus darlingtoni* |  |  |
|  | King River Bat |  |  | *Eptesicus regulus* |  |  |
|  | Water Rat |  |  |  | *Hydromys chrysogaster* |  |

**Introduced Mammals**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Black Rat |  |  |  | *Rattus rattus* |
|  | Brown Rat |  |  |  | *Rattus norvegicus* |
|  | House Mouse |  |  |  | *Mus musculus* |
|  | Rabbit |  |  |  |  | *Oryctolagus cuniculus* |
|  | Fox |  |  |  |  | *Vulpes vulpes* |
|  | Feral Cat |  |  |  | *Felis catus* |  |
|  | Feral Pig |  |  |  | *Sus scrofa* |  |
|  | Feral Goat |  |  |  | *Capra hircus* |  |

**reptile and amphibian list**  
  
  
**Reptiles**  
Eastern Long-necked Tortoise        *Chelodina longicollis*

|  |  |  |  |
| --- | --- | --- | --- |
| Bearded Dragon |  |  | *Amphibolurus barbatus* |
| Cunningham's Skink |  |  | *Egernia cunninghami* |
| Grass Skink |  |  |  | *Lampropholis guichenoti* |
| Three-lined Skink |  |  | *Leiolopisma* *trilineata* |  |
| Bouganville's Skink |  |  | *Lerista bouganvilli* |  |
| Striped Skink |  |  |  | *Ctenotus robustus* |
| Common Water Skink |  | *Eulamprus tympanum* |  |  |

Eastern Blue-Tongued Lizard        *Tiliqua scincoid*es

|  |  |  |  |
| --- | --- | --- | --- |
| Stumpytail Lizard |  |  | *Trachydosaurus rugosus* |
| Eastern Tiger Snake |  |  | *Notechis scutatus* |
| Red-bellied Black Snake |  | *Pseudechis porphyriacus* |  |
| Eastern Brown Snake |  | *Pseudonaja textilis* |  |

**Amphibians**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Froglet |  |  | *Ranidella signifera* |
| Growling Grass Frog |  | *Litoria raniformis* |  |

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**ORGAN PIPES NATIONAL PARK  
  
Plant Species List - May 1991**

Compiled from lists of Barry Kemp, Rosemary Myers, L. Jolley and Keith McDougall; \* indicates an exotic species. @ - re-introduced and persisting. # - re-introduced but also occurring naturally in the Park.   
  
There are 164 native species and 113 exotic species recorded for the Park. These numbers will continue to change as further re-introductions of basalt plains flora are made and exotic species are eradicated.  
  
**Ferns**  
  
          
Rock Fern        *Cheilanthes austrotenuifolia*  
Bristly Cloak-fern        *Cheilanthes distans*  
Sickle Fern        *Pellaea falcata*  
  
Necklace Fern        *Asplenium flabellifolium*  
Blanket Fern*Pleurosorus rutifolius*  
  
Pacific Azolla*Azolla filiculoides*  
  
Bracken        *Pteridium esculentum*  
 **Gymnosperms**  
Murray Pine @        *Callitris glaucophylla*  
 **Angiosperms - Monocotyledons**  
  
Water Plantain        *Alisma plantago-aquatica*  
  
  
Drain Flat-sedge        \* *Cyperus eragrostis*  
Common Spike-rush        *Eleocharis acuta*  
Slender Spike-rush        *Eleocharis gracilis*  
Nodding Club-rush        *Isolepis cernua*  
Swamp Club-rush        *Isolepis inundata*  
River Club-rush        *Schoenoplectus validus*  
Common Bog-rush        *Schoenus apogon*  
  
Onion-grass        \* *Romulea rosea*  
  
Sharp Rush        \* *Juncus acutus*  
Rush        *Juncus amabilis*  
Toad Rush        *Juncus bufonius*  
Grassy Rush        *Juncus caespiticus*  
Pale Rush        *Juncus pallidus*  
Rush Duckweed        *Juncus sarophorus*  
Finger Rush        *Juncus subsecundus*  
  
Water-ribbons        *Triglochin procera*  
  
Common Duckweed        \* *Lemna minor*  
Tiny Duckweed        *Wolffia australiana*  
  
Bulbine Lily @        *Bulbine bulbosa*  
Pale-anther Flax-lily #        *Dianella longifolia* var. *longifolia*  
Black-anther Flax-lily #        *Dianella revoluta*  
  
Perennial Beard-grass        \* *Agropogon littoralis*  
Creeping Bent\* *Agrostis stolonifera*  
Silvery Hair-grass*\* Aira caryophyllea*  
Cane Wire-grass        *Aristida ramosa*  
Bearded Oat        \* *Avena barbata*  
Wild Oat        \* *Avena fatua*  
Oat        \* *Avena sterilis* ssp. *ludoviciana*  
Redleg Grass #        *Bothriochloa macra*  
Large Quaking-grass        \* *Briza maxima*  
Lesser Quaking-grass        \* *Briza minor*  
Prairie grass        \* *Bromus catharticus*  
Great Brome        \* *Bromus diandrus*  
Soft Brome        \* *Bromus hordeaceus*  
Compact Brome        \* *Bromus madritensis*  
Windmill Grass #        *Chloris truncata*  
Barley-grass        \* *Critesion murinum* ssp. *leporinum*  
Couch        \* *Cynodon dactylon*  
Rough Dog's-tail        \* *Cynosurus echinatus*  
Cocksfoot        \* *Dactylis glomerata*  
Lobed Wallaby-grass        *Danthonia auriculata*  
Common Wallaby-grass        *Danthonia caespitosa*  
Brown-back Wallaby grass #        *Danthonia duttoniana*  
Kneed Wallaby-grass        *Danthonia geniculata*  
Velvet Wallaby-grass        *Danthonia pilosa*  
Wallaby-grass        *Danthonia racemosa*  
Bristly Wallaby-grass        *Danthonia setacea*  
Fern Grass        \* *Desmazeria rigidum*  
Silky Blue-grass #        *Dicanthium sericeum*  
Salt Grass        *Distichlis distichophylla*  
Perennial Veldt Grass        \* *Ehrharta calycina*  
Wheat Grass        *Elymus scabrus*  
Pappus Grass        *Enneapogon nigricans*  
Love Grass        *Eragrostis brownii*  
Fragile Oat        \* *Gaudinia fragilis*  
Yorkshire Fog        \* *Holcus lanatus*  
Rigid Panic #        *Homopholis proluta*  
Perennial Rye-grass        \* *Lolium perenne*  
Weeping Grass        *Microlaena stipoides*  
Fine Spear Grass        \* *Nassella hyalina*  
Chilean Needle-grass        \* *Nassella neesiana*  
Serrated Tussock        \* *Nassella trichotoma*  
Australian Millet @        *Panicum decompositum*  
Coast Barb-grass        \* *Parapholis incurva*  
Paspalum        \* *Paspalum dilatatum*  
Canary-grass        \* *Phalaris aquatica*  
Lesser Canary-grass        \* *Phalaris minor*  
Common Reed        *Phragmites australis*  
Tussock Grass #        *Poa labillardieri*  
Annual Beard-grass        \* *Polypogon monspeliensis*  
Tiny Bristle-grass        \* *Rostraria pumila*  
Buffalo Grass        \* *Stenotaphrum secundatum*  
Spear Grass @        *Stipa gibbosa*  
Spear Grass        *Stipa nodosa*  
Spear Grass        *Stipa pubinodis*  
Kangaroo Grass #        *Themeda triandra*  
Rye Beetle-grass        *Tripogon loliiformis*  
Wheat        \* *Triticum aestivum*  
Squirrel-tail Fescue        \* *Vulpia bromoides*  
  
Bulrush        *Typha domingensis*  
  
Spiny-headed Mat-rush        *Lomandra longifolia*  
  
**Angiosperms - dicotyledons**  
Karkalla #        *Carpobrotus rossii*  
New Zealand Spinach @        *Tetragonia tetragonioides*  
  
Lesser Joyweed        *Alternantheradenticulata*  
White Amaranth        \* *Amaranthus albus*  
Pussy-tails        *Ptilotus spathulatus*  
  
Pepper-tree        \* *Schinus molle*  
  
Sea Celery        *Apium prostratum*  
Fennel        \* *Foeniculum vulgare*  
  
Blue Periwinkle        \* *Vinca major*  
  
  
Cape Weed        \* *Arctotheca calendula*  
Aster-weed        \* *Aster subulatus*  
Lemon Beauty-heads @        *Calocephalus citreus*  
Tufted Burr-daisy @        *Calotis scapigera*  
Slender Thistle        \* *Carduus tenuiflorus*  
Saffron Thistle        \* *Carthamus lanatus*  
Chinese Scrub @        *Cassinia arcuata*  
Shiny Cassinia @        *Cassinia longifolia*  
Spear Thistle        \* *Cirsium vulgare*  
Tall Fleabane        \* *Conyza bonariensis*  
Common Cotula        *Cotula australis*  
Water-buttons        \* *Cotula coronopifolia*  
Golden Billy-buttons @        *Craspedia chrysantha*  
Smooth Hawksbeard        \* *Crepis capillaris*  
Spanish Artichoke        \* *Cynara cardunculus*  
Stinkwort        \* *Dittrichia graveolons*  
Creeping Cud-weed        *Gnaphalium involucratum*  
Common Everlasting @        *Helichrysum apiculatum*  
Everlasting @        *Helichrysum* sp. aff. *rutidolepis*  
Clustered Everlasting @        *Helichrysum semipapposum*  
Chamomile Sunray #        *Helipterum anthemoides*  
Cat's-ear        \* *Hypochoeris radicata*  
Heraldic Thistle        \* *Onopordum acanthium*  
Ox-tongue        \* *Picris echioides*  
Jersey Cud-weed        *Pseudognaphalium luteoalbum*  
Groundsel        *Senecio cunninghamii*  
Fireweed @        *Senecio glomeratus*  
Groundsel @        *Senecio macrocarpus*  
Cotton Fireweed @        *Senecio quadridentatus*  
Variegated Thistle        \* *Silybum marianum*  
Prickly Sow Thistle        \* *Sonchus asper*  
Sow Thistle        \* *Sonchus oleraceus*  
Salsify        \* *Tragopogon porrifolius*  
New Holland Daisy @        *Vittadinia* sp.  
  
Paterson's Curse        \* *Echium plantagineum*  
  
Hoary Cress        \* *Cardaria draba*  
Cress        \* *Lepidium africanum*  
Field Cress        \* *Lepidium campestre*  
Wild Radish        \* *Raphanus raphanistrum*  
Hedge Mustard        \* *Sisymbrium officinale*  
  
Prickly-pear        \* *Opuntia* sp.  
  
Desert Cassia @        *Senna artemisioides* ssp. *filifolia*  
  
Angled Lobelia        *Lobelia alata*  
Tufted Bluebell #        *Wahlenbergia communis*  
Tall Bluebell        *Wahlenbergia stricta*  
  
White Elderberry        *Sambucus gaudichaudiana*  
  
Hairy Pink        \* *Petrorhagia velutina*  
Sea Pearlwort        \* *Sagina maritima*  
Corn Spurrey        \* *Spergula arvensis*  
Drooping She-oak @        *Allocasuarina verticillata*  
  
Berry Saltbush #        *Atriplex semibaccata*  
Wild Beet        \* *Beta vulgaris*  
Small-leaf Goosefoot        *Chenopodium desertorum* ssp. *microphyllum*  
Sowbane        \* *Chenopodium murale*  
Clammy Goosefoot        *Chenopodium pumilio*  
Saloop @        *Einadia hastata*  
Nodding Saltbush #        *Einadia nutans*  
Barrier Saltbush #        *Enchylaena tomentosa*  
Common Bluebush @        *Maireana decalvens*  
Wingless Bluebush        *Maireana enchylaenoides*  
Fragrant Saltbush @        *Rhagodia parabolica*  
Prickly Saltwort        *Salsola kali*  
  
Small St.John's Wort        *Hypericum gramineum*   
  
Large Bindweed        *Calystegia sepium*  
Common Bindweed        \* *Convolvulus arvensis*  
Blushing Bindweed #        *Convolvulus erubescens*  
Kidney-weed        *Dichondra repens*  
  
Swamp Crassula        *Crassula helmsii*  
Sieber Crassula        *Crassula sieberana*  
  
Paddy Melon        \* *Cucumis myriocarpus*  
  
Flat Spurge        *Euphorbia drummondii*  
Petty Spurge        \**Euphorbia peplus*

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| Grey Parrot-pea @ | *Dillwynia sericea* |
| Speading Eutaxia @ | *Eutaxia microphylla* var. *diffusa* |
| Common Eutaxia | *Eutaxia microphylla* var. *microphylla* |
| Variable Glycine @ | *Glycine tabacina* |
| Golden-tips @ | *Goodia lotifolia* |
| Sarsparilla | *Hardenbergia violacea* |
| Austral Indigo @ | *Indigofera australis* |
| Running Postman @ | *Kennedia prostrata* |
| Burr Medic | \* *Medicago polymorpha* |
| Sweet Melilot | \* *Melilotus indica* |
| Leafy Templetonia @ | *Templetonia stenophylla* |
| Narrow-leaf Clover | \* *Trifolium angustifolium* |
| Hop Clover | \* *Trifolium campestre* |
| Strawberry Clover | \* *Trifolium fragiferum* |
| Cluster Clover | \* *Trifolium glomeratum* |
| Knotted Clover | \* *Trifolium striatum* |
| Subterraneum Clover | \**Trifolium subterraneum* |
| Furze | \* *Ulex europaeus* |
| Common Vetch | \* *Vicia sativa* |
| Golden Spray | *Viminaria juncea* |

Common Fumitory        \* *Fumaria officinalis*

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| Centaury | \* *Centaurium tenuiflorum* |

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| Big Heron's-bill | \* *Erodium botrys* |
| Blue Heron's-bill | *Erodium crinitum* |
| Cut-leaf Crane's-bill | \* *Geranium dissectum* |
| Crane's-bill # | *Geranium retrorsum* |
| Austral Stork's-bill | *Pelargonium australe* |

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| Goodenia @ | *Goodenia gracilis* |
| Hop Goodenia @ | *Goodenia ovata* |

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| Common Raspwort @ | *Gonocarpus tetragynus* |
| Water Milfoil | *Myriophyllum verrucosum* |

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| Horehound | \* *Marrubium vulgare* |
| River Mint | *Mentha australis* |

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| Native Flax | *Linum marginale* |

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| Small Loosestrife | *Lythrum hyssopifolia* |

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| Austral Hollyhock | *Lavatera plebeia* (last seen 1974) |
| Mallow | \* *Malva* sp. |
| Carolina mallow | \* *Modiola caroliniana* |

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| Gold-dust Wattle # | *Acacia acinacea* |
| Silver Wattle # | *Acacia dealbata* |
| Lightwood # | *Acacia implexa* |
| Black Wattle # | *Acacia mearnsii* |
| Blackwood # | *Acacia melanoxylon* |
| Hedge Wattle @ | *Acacia paradoxa* |
| Golden Wattle @ | *Acacia pycnantha* |
| Wirilda @ | *Acacia retinodes* |
| Prickly Moses # | *Acacia verticillata* |

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| Turkey-bush @ | *Eremophila deserti* |
| Coast Boobialla @ | *Myoporum insulare* |
| Sticky Boobialla @ | *Myoporum viscosum* |

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| River Bottlebrush # | *Callistemon sieberi* |
| Fringe-myrtle | *Calytrix tetragona* |
| River Redgum # | *Eucalyptus camaldulensis* |
| Sugar Gum | \**Eucalyptus cladocalyx* |
| Yellow Gum # | *Eucalyptus leucoxylon* |
| Yellow Box # | *Eucalyptus melliodora* |
| Grey Box # | *Eucalyptus microcarpa* |
| Manna Gum @ | *Eucalyptus viminalis* |
| Woolly Tea-tree # | *Leptospermum lanigerum* |

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| Variable Willow-herb | *Epilobium billardierianum* ssp. *cinereum* |
| Glandular Willow-herb | \**Epilobium ciliatum* |
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| Hairy Willow-herb | *Epilobium hirtigerum* |
| Wood-sorrel | *Oxalis perennans* |
| Sowsob | \* *Oxalis pes-caprae* |

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| Red-ink Weed | \* *Phytolacca octandra* |

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| Sweet Bursaria # | *Bursaria spinosa* |

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| Buck's-horn Plantain | \* *Plantago coronopus* |
| Ribwort | \* *Plantago lanceolata* |
| Variable Plantain | *Plantago varia* |

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| Three-cornered Jack | \* *Emex australis* |
| Tangled Lignum @ | *Muehlenbeckia cunninghamii* |
| Persicaria | \* *Persicaria maculosa* |
| Prostrate Knotweed | \* *Polygonum aviculare* |
| Sheep Sorrel | \* *Rumex acetosella* spp. agg. |
| Slender Dock | *Rumex brownii* |
| Curled Dock | \* *Rumex crispus* |
| Dock | *Rumex* sp. |

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| Pimpernel | \* *Anagallis arvensis* | Pimpernel |
| Creeping Brookweed | *Samolus repens* | Creeping Brookweed |

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| Silver Banksia @ | *Banksia marginata* |

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| Small-leaf Clematis # | *Clematis microphylla* |

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| Weld | \* *Reseda luteola* |
| Bidgee-widgee | *Acaena nove-zelandiae* |
| Sheep's-burr @ | *Acaena echinata* |
| Sweet Briar | \* *Rosa rubiginosa* |
| Blackberry | \* *Rubus fruticosus* spp. agg. |
| Small-leaf Bramble | *Rubus parvifolius* |

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| Prickly Woodruff | *Asperula scoparia* |
| Cleavers | \* *Galium aparine* |

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| Rock Correa # | *Correa glabra* |

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| Weeping Willow | \* *Salix babylonica* |

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| Wedge-leaf Hop-bush # | *Dodonea viscosa* ssp. *cuneata* |

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| Creeping Monkey-flower | *Mimulus repens* |
| Twiggy Mullein | \* *Verbascum virgatum* |

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| Common Thorn-apple | \* *Datura stramonium* |
| African Box-thorn | \* *Lycium ferocissimum* |
| Austral Tobacco | *Nicotiana suaveolens* |
| Kangaroo Apple # | *Solanum laciniatum* |
| Apple of Sodom | \* *Solanum linnaeanum* |
| Black Nightshade | \* *Solanum nigrum* |

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| Smooth Rice-flower | *Pimelea glauca* |
| Slender Rice-flower | *Pimelea linifolia* |

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| Scrub Nettle | *Urtica incisa* |

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| Purple-top Verbena | \* *Verbena bonariensis* |
| Tree Violet # | *Hymenanthera dentata* |

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| Twin-leaf | *Zygophyllum glaucum* |

Definition of National Park  
  
The 10th General Assembly of IUCN, held in New Delhi in November 1969 approved a definition of the term "national park" in accordance with the following resolution:

1. Considering the importance given by the United Nations to the national concept, as a sensible use of natural resources, and considering the increasing use which has been made during these last few years in some countries of the term "national park" to designate areas with increasingly different status and objectives. The 10th General Assembly of IUCN meeting in New Delhi in November 1969 recommends that all governments agree to reserve the term "national park" to areas answering the following characteristics and to ensure that their local authorities and private organizations wishing to set aside nature reserves do the same:
2. national park is a relatively large area where:
3. 1.one or several ecosystems are not materially altered by human exploitation and occupation, where plant and animal species, geomorphological sites and habitats are of special scientific, educative and recreative interest or which contain natural landscape of great beauty;
   1. 2.the highest competent authority of the country has taken steps to prevent or eliminate as soon as possible exploitation or occupation in the whole area and to enforce effectively the respect of ecological, geomorphological or aesthetic features which have led to its establishment; and
   2. 3.visitors are allowed to enter, under special conditions, for inspirational, educative, cultural and recreative purposes.

Governments are accordingly requested not to designate as "national park":

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|  | 1. | A scientific reserve which can be entered only by special permission (strict nature reserve). |

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|  | 2. | A natural reserve managed by a private institution or a lower authority without some type of recognition and control by the highest competent authority of the country. |

1. 3.A "special reserve" as defined in the African Convention on the Conservation of Nature and Natural Resources of 1968 (fauna or flora reserve, game reserve, bird sanctuary, geological or forest reserve, etc).
2. 4.An inhabited and exploited area where landscape planning and measures taken for the development of tourism have led to the setting up of "recreation areas" where industrialization and urbanization are controlled and where public outdoor recreation takes priority over the conservation of ecosystems (*parc naturel regional*, nature park, Naturpark, etc). Areas of this description which may have been established as "natural parks" should be redesignated in due course.
3. resolution was subsequently adopted by the Second World Conference on Natural Parks (Yellowstone and Grand Teton National Parks, 1972).

[Friends of Organ Pipes National Park Home](http://home.vicnet.net.au/~foopnp/friends.htm)