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GEOGRAPHY

PHYSICAL FEATURES

Boundaries and areas

Creation of Victoria

The boundaries of the Port Phillip District of New South Wales were defined in *Imperial Act 5 & 6 Victoriae* c.76 of 30 July 1842 ('An Act for the Government of New South Wales and Van Diemen's Land') as follows:

'... the Boundary of the District of Port Phillip on the North and North-east shall be a straight Line drawn from Cape Howe to the nearest Source of the River Murray, and thence the Course of that River to the Eastern Boundary of the Province of South Australia.'

Previously, by *Imperial Act 4 & 5 William IV* c.95 of 15 August 1834, *Letters Patent* of about 19 February 1836, and *Imperial Act 1 & 2 Victoriae* c.60 of 31 July 1838, the eastern boundary of the Province of South Australia was fixed as '... the One hundred and forty-first Degree of East Longitude ...'.

By *Imperial Act 13 & 14 Victoriae* c.59 of 5 August 1850 ('An Act for the better Government of Her Majesty's Australian Colonies'), the District of Port Phillip was granted the right to separate from New South Wales.

Boundaries

On 2 May 1851, the Victoria Electoral Act of 1851 was passed (*New South Wales Act 14 Victoria* No. 47) which provided for the division of the Colony of Victoria into electoral districts. A schedule to the Act set forth the boundaries of the electoral districts, being based on the boundaries of the counties then in existence. Those boundaries of the electoral districts which formed the boundaries of Victoria were described as:

'a line running in a westerly direction from Cape Howe to the source of the nearest tributary of the Murray';

'the River Murray';

'the South Australian frontier';

'the 141st meridian being the line dividing the Colony of New South Wales from South Australia';

'the sea';

'the sea shore';

'the sea coast';

'including the Lawrence and Lady Julia Percy's Islands';

'including all the islands at Port Fairy';

'Port Phillip Bay';

'the shores of Port Phillip Bay';

'the waters of Port Phillip';

'including the small islands near the channels at the mouth of Port Phillip and those of Geelong Bay';

'including French and Phillip Islands and the small islands in Western Port Bay'.

Writs for the election of a Legislative Council in Victoria were issued on 1 July 1851, thereby establishing the Colony of Victoria.

Murray River

The separation of Victoria from New South Wales in 1851, and the successful navigation of the

Murray River by steam vessels, encouraged widespread evasion of New South Wales customs duties on articles taken across from Victoria and South Australia. The question arose as to which colony had jurisdiction over the waters of the Murray River. The position was determined by the New South Wales Constitution (*Imperial Act 18 & 19 Victoriae c.54 of 16 July 1855*), which decreed that the whole watercourse of the Murray River from its source to the eastern boundary of the Colony of South Australia was thereafter to be within the Territory of New South Wales, thus fixing the left bank as the boundary between Victoria and New South Wales.

In May 1980, the High Court of Australia clarified the situation further by ruling that the northern boundary of Victoria followed the top of the southern (left) bank of the Murray River all territory to the north being within New South Wales.

Cape Howe to the Murray River

In 1866, following the discovery of gold on the tributaries of the Snowy River near the position where the boundary was thought to be, it became evident that the remaining portion of the New South Wales-Victoria boundary should be marked on the ground. A definitive point at Cape Howe was agreed upon by the two colonies following an on-site conference between the New South Wales Surveyor General (P. F. Adams) and the Victorian Government Astronomer and Superintendent of Geodetic Survey (R. L. J. Ellery). This point was marked and named Conference Point.

Late in 1869, Alexander Black, a Victorian geodetic surveyor, was directed to determine the headwaters of the Murray River. These he identified as a certain spring near Forest Hill. Black then proceeded to clear and mark the western portion of the boundary while another Victorian geodetic surveyor, Alexander C. Allan, marked the eastern portion. The marking was completed in early 1872 and the line, which extended some 176 kilometres through extremely rugged country, passed within 5.6 metres of the provisionally established Conference Point.

The official technical description of the boundary gave as the initial azimuth $116^{\circ} 58' 09.42''$ from the spring to Station No. 1 on Forest Hill (452.6 metres away), while from a point on the coast at Cape Howe, 176,492.1 metres from the spring, the azimuth of the same line extending out to sea was given as $115^{\circ} 53' 41.36''$ to a point distant one league (5.56 kilometres) from high water line at Cape Howe.

The total length of the New South Wales boundary including the Murray River is about 2,050 kilometres.

For details regarding the Victoria - South Australia border, refer to pages 46-7 of the *Victorian Year Book 1985*.

Offshore boundaries

The *Imperial Act 13 & 14 Victoriae c.59 of 5 August 1850* which separated the Colony of Victoria from New South Wales described only the land boundaries of the new colony; no southern boundary was defined. However, the northern boundary of Van Diemen's Land (Tasmania) was defined in 1825 as the latitude $39^{\circ} 12'$ south and this has generally been accepted as the southern limit of Victoria's jurisdiction. It lies about 7 kilometres south of Wilsons Promontory. The lateral offshore boundaries between Victoria and the adjoining mainland States have not been defined.

In 1973, the Commonwealth Government passed the *Seas and Submerged Lands Act 1973* (No. 161), and it received Royal Assent on 4 December 1973. The Act declares that the sovereignty in respect of the territorial sea of Australia, and in respect of the air space over it and in respect of its bed and subsoil, is vested in and exercisable by the Crown in right of the Commonwealth. The Act gives the Governor-General power to proclaim the breadth of the territorial sea, and the power to proclaim the baseline from which the breadth of the territorial sea is to be measured. The Act declares that the sovereignty in respect of the internal waters of Australia (that is to say, any waters of the sea on the landward side of the baseline of the territorial sea) not within the limits of a State, and in respect of the airspace over those waters and in respect of the seabed and subsoil beneath those waters, is vested in and exercisable by the Crown in right of the Commonwealth.

Baselines from which the territorial sea is to be measured are delimited according to procedures spelt out by the Convention on the Territorial Sea and the Contiguous Zone which was signed at Geneva on 29 April 1958, and under which Australia has obligations under international law.

The six Australian States challenged the validity of the Seas and Submerged Lands Act in the High Court of Australia, but in the decision handed down on 17 December 1975, the High Court dismissed all actions, thereby confirming that, broadly speaking, the sovereignty of the Crown in right of the States extends only to the low-water line. This applies both to the mainland and to islands off the coast

which belong to the State, which in the case of Victoria would probably mean all islands between 140° 58' and 149° 58' east longitude (approximately) to the north of 39° 12' south latitude.

Depth

Although no depth limitation for Victoria was given in the Imperial Statutes defining the boundaries of Victoria, it has always been accepted that the Crown has sovereignty to the centre of the earth. The Land Act of 1891 imposed a depth limit in new Crown grants and, since 8 August 1892, 99 per cent of Crown grants issued have been limited to the surface and down to a depth of 15.24 metres below the surface. Since 3 July 1973, the depth limitation for new Crown grants has been 15 metres. A well or spring to obtain water from the ground is not necessarily subject to the depth limitation imposed in the Crown grant.

The exceptions to the 15 metres depth limitation on freehold tenure are:

- (1) In areas close to coal mines, gravel deposits, etc., where the depth limits were fixed in 1909 at 7.62 metres, sometimes 6.10 metres, or 9.14 metres – e.g., Wonthaggi, Kirrak, Korumburra, Woolamai, and Tarwin. Crown grants issued since 3 July 1973 in Wonthaggi and Kirrak are to be the same as elsewhere, namely 15 metres;
- (2) On sites for buildings with deep foundations, e.g. 30 metres, 60 metres;
- (3) Some land at Morwell and Churchill—305 metres; and
- (4) Lands vested in the Commonwealth. The depth limitation is usually 76 metres (occasionally 15 metres) but by sections 8 and 10 of the *Lands Acquisition Act* 1955-1973, the Commonwealth can compulsorily acquire Crown lands to unlimited depth, thus implying that the State of Victoria extends to the centre of the earth.

Height

Although no height limitation for Victorian territory was given in the Imperial Statutes defining the boundaries of Victoria, it has generally been accepted that the Crown has complete and exclusive sovereignty over the air space above its territories.

The Convention on Civil Aviation of 1944 (the Chicago Convention), to which Australia was a party, recognises that every contracting State has complete and exclusive jurisdiction over the air space above its territory. Territory is defined for the purposes of the Convention as being the land areas and territorial waters adjacent thereto under the sovereignty of the contracting State.

The Commonwealth Parliament has the constitutional power to legislate to give effect to the Chicago Convention and in relation to air navigation with respect to trade and commerce with other countries and among the Australian States.

The Victorian Parliament has power to make laws relating to the control and use of the air space above its territory which are not inconsistent with laws made by the Commonwealth Parliament on the matter.

In pursuance of its constitutional powers the Commonwealth Parliament has passed legislation regulating air navigation within the air space over the whole of Australia. The Victorian Parliament has passed the Air Navigation Act of 1958 which provides that the Air Navigation Regulations made under the Commonwealth Air Navigation Act, to the extent that they do not apply to the air space over Victoria of their own force, apply to air navigation within that air space as Victorian law.

Geographic position and area

The most southerly point of Wilsons Promontory, in latitude 39° 08' S., longitude 146° 22' 30' E., is the southernmost point of the mainland of Victoria and similarly of the mainland of Australia; the northernmost point is where the western boundary of the State meets the Murray River, latitude 33° 59' S., longitude 140° 58' E; the point furthest east is Cape Howe, situated in latitude 37° 31' S., longitude 149° 58' E. The westerly boundary lies upon the meridian 140° 58' E., and extends from latitude 33° 59' S. to latitude 38° 04' S., a distance of 451 kilometres.

Victoria covers an area of about 227,600 square kilometres. It is therefore slightly smaller than Great Britain which (if inland water is included) contains 229,900 square kilometres.

The following table shows the area of Victoria in relation to that of Australia, the other States, and mainland Territories:

AREA OF STATES AND TERRITORIES

State or Territory	Area in square kilometres	Percentage of total area
Western Australia	2,525,500	32.88
Queensland	1,727,200	22.48
Northern Territory	1,346,200	17.52
South Australia	984,000	12.81
New South Wales	801,600	10.44
Victoria	227,600	2.96
Tasmania	67,800	0.88
Australian Capital Territory	2,400	0.03
Australia	7,682,300	100.00

Mountain areas

A wedge of mountainous country extends across Victoria; it tapers from the high peaks of the north-east and far east of the State to the western limits of the highlands at the lower Dundas Tableland near the South Australian border. This belt of high country, which includes the Great Dividing Range, separates the Northern, Wimmera, and Mallee Plains from the plains and uplands of the coastal areas and forms the watershed dividing the northern flowing tributaries of the Murray River from the southern flowing streams. Further information on the Great Dividing Range in Victoria can be found in Chapter 1 of the 1980 edition of the *Victorian Year Book*.

Considerable geological variation occurs in the highlands with granitic intrusives, volcanic complexes, sedimentary and metamorphic rocks, and a range of geological structures. Broad plateaux, high plains, and extensive ridge and valley terrains are the chief topographic characteristics with only occasional high peaks and deep gorges occurring. A broad low pass to the north of Melbourne (the Kilmore Gap) provides an easy route across the highlands and this is utilised by the major road and rail links to the north. The Kilmore Gap provides a convenient reference point at which to divide the highlands into eastern and western sections.

Eastern section

The highlands of eastern Victoria consist of strongly dissected and steeply sloping forested country with narrow ridges and deep V-shaped valleys. The area which includes the highest peaks is contiguous with the Kosciusko massif in New South Wales, but the Victorian mountains lack the clear evidence of past glacial activity that can be found in limited areas of Kosciusko. Frost weathering has been intensive at higher elevations and some spectacular accumulations of weathered rock occur as block streams or rock rivers such as Mt Wombargo near the headwaters of the Murray River.

The high country is not typically alpine in character: sharpened peaks and precipitous bluffs are rare, although the Cobberas, The Bluff, and the Mt Buffalo gorge all have impressive cliffs. One distinctive feature of the generally dissected mountain landscape is the High Plains country. Flat to gently undulating topography at elevations of 1,300 metres and above occurs, for example, as the Nunniong, Bogong, and Dargo High Plains, and the High Plains of the Snowy Range. These plains are remnants or residuals of formerly more extensive upland surfaces and include many different rock types—the basalts of the Bogong and Dargo High Plains being two of the best known.

Although snow capped for the winter season with a snow line at about 1,000 metres, even the highest peaks—Mt Bogong (1,986 metres) and Mt Feathertop (1,922 metres)—become free of snow in summer.

Western section

The highlands here are of much lower relief than the eastern section and in places lack the clearly defined watershed of the eastern ranges. A notable feature is the concentration of volcanic activity (Newer Volcanics) extending from just north of Melbourne to beyond Ballarat in the west. Over 200 eruption points have been identified with many of the lava flows now forming ridges which bury the pre-volcanic stream channels and give rise to deep leads, some of which are gold bearing. Diversion and modification of river courses by lava flows has led to the formation of waterfalls, for example, on the Coliban River at Trentham Falls where the river runs across lava and cascades over twenty metres onto bedrock.

The most rugged section of highland in western Victoria is the Grampians, a series of resistant sandstone ridges etched out by differential weathering and removal of softer siltstones and shales. The

highest peak, Mt William (1,167 metres), has a spectacular easterly facing escarpment and a broad plateau-like summit surface. The Grampians form a major water catchment for the Wimmera and Glenelg systems.

The following table lists some of Victoria's highest mountains:

HEIGHT OF SELECTED MOUNTAINS, VICTORIA
(metres)

Mountain	Height	Mountain	Height
Bogong	1,986	Niggerhead	1,843
Feathertop	1,922	Mckay	1,843
Nelse North	1,883	Cobberas No. 1	1,838
Fainter South	1,877	Cope	1,837
Loch	1,874	Spion Kopje	1,836
Hotham	1,861	Buller	1,804

Coastline

The Victorian coastline comprises many types of environments. Broad sandy beaches and impressive cliffed headlands along the ocean coast contrast with mangrove-fringed mudflats and marshland of the sheltered embayments and estuaries. There are approximately 1,200 kilometres of ocean coast between Cape Howe and the South Australian border; in addition three large embayments—Port Phillip Bay (260 kilometres), Western Port Bay (140 kilometres), and Corner Inlet (80 kilometres)—partially enclose protected waters where most of the ports and harbours are situated.

Much of the ocean coast is exposed to high wave energy from strong and regular ocean swells and storm wave activity generated in the Southern Ocean. In western Victoria, swells arrive predominantly from the west and south-west, while the coastline of eastern Victoria (particularly east of Wilsons Promontory) is subject to swell from the south-east across the Tasman Sea. The shape of the long, gently curving Ninety Mile Beach from Corner Inlet to Lakes Entrance is determined by wave action from this swell.

Three general coastal types may be recognised: cliffed coasts, sandy coasts, and salt marsh and swamp coasts. The most extensive cliffed section is west of Port Phillip Bay from Torquay to Warrnambool, including a zone where the Otway Ranges lie adjacent to the coastline. The sediments of the Otways generally dip seaward and form steep cliffs, commonly with a level rock bench called a shore platform lying between high and low tide marks. Along this sector, sandy beaches are rare, being confined to small embayments or river mouths and often containing a high component of gravel.

West of Cape Otway to Warrnambool and particularly from the Gellibrand River to Peterborough is a spectacular cliffed coastline cut into soft horizontally bedded limestones and marls. Wave action has eroded along joints and weaknesses in the rock to produce near-vertical cliffs up to 60 metres high and forming blowholes, arches, and isolated rock stacks. Many of these features may be observed in the Port Campbell National Park.

High cliffed sectors are formed in volcanic rocks near Portland where Cape Nelson and Cape Bridgewater exhibit a variety of volcanic features. As well, the coast at Cape Schanck and the ocean coast of Phillip Island are cliffed in early Tertiary lava flows. Along the Gippsland coast Mesozoic and Palaeozoic sediments form high cliffs at Cape Paterson and Cape Liptrap, while the plunging cliffs of Wilsons Promontory are of granite. Shore platforms occur in both the sediments and the volcanic rocks but are not found in the granite sectors.

Sandy beaches backed by extensive dune topography extend around Discovery Bay in far western Victoria. In many places these dunes are actively eroding and sand is spilling and blowing inland to cover coastal vegetation. Similar erosion is also present along the Ninety Mile Beach and on the sandy beaches and dunes further east between Lakes Entrance and Cape Howe. Much of this erosion is being controlled by soil conservation measures.

Estuary and lagoon systems occur at river mouths or where embayments have been partially or wholly enclosed by sand barriers. Rivers such as the Snowy, Barwon, and Glenelg have lagoons occupying their lower reaches and the river mouth may be constricted by the growth of sandy spits. These may be breached and modified by flood discharge. During the floods of early 1971 the Snowy River shifted its outlet over one kilometre to the west by breaking through the dune-capped barrier which formerly deflected the entrance eastward of Marlo.

The Gippsland Lakes are an extensive lagoon system enclosed behind broad sandy barrier systems. In the sheltered lake waters deposits of silt and mud have accumulated among the reed swamps at the mouths of rivers to form long silt jetties or deltas. The largest of these, the Mitchell delta, and its companion at the mouth of the Tambo River are no longer extending, but are subject to erosion by wave action.

In the shallow and sheltered waters of Western Port Bay and Corner Inlet, mangrove swamps and salt marshes form a broad coastal fringe. Creeks and channels cross the soft, sticky mud-flats exposed in front of the mangrove fringe and form intricate patterns of tidal drainage. Smaller areas of mud and mangrove occur in the estuaries of the Barwon River and the Tarwin River; in the latter, the rapid spread of an introduced, salt-tolerant plant (*Spartina anglica*) is of particular interest.

Physical divisions

The chief physical divisions of Victoria are shown in Figure 1 on page 31. Each of these divisions has certain physical features (elevation, geological structure, climate, and soils) which distinguish it from the others. The following is a list of these divisions:

1. Murray Basin Plains:
 - (a) The Mallee
 - (b) The Riverine Plains
 - (c) The Wimmera
2. Central Highlands:
 - A. The Eastern Highlands
 - B. The Western Highlands:
 - (a) The Midlands
 - (b) The Grampians
 - (c) The Dundas Tablelands
3. Western District Plains:
 - (a) The Volcanic Plains
 - (b) The Coastal Plains
4. Gippsland Plains:
 - (a) The East Gippsland Plains
 - (b) The West Gippsland Plains
5. Southern Uplands:
 - (a) The Otway Ranges
 - (b) The Barrabool Hills
 - (c) The Mornington Peninsula
 - (d) The South Gippsland Highlands
 - (e) Wilsons Promontory

Murray Basin Plains

These plains include the areas commonly known as the Mallee, the Wimmera, and the Northern or Riverine Plains. The plains are effectively subdivided by a topographic feature known as the Leagur Fault which runs sub-parallel with the Loddon River immediately west of Kerang.

From the Murray River to the Central Highlands, eastwards of the Leagur Fault, is the remarkably flat landscape of the Riverine Plains, which are coalescing alluvial plains of the Murray, Ovens, Broken, Goulburn, Campaspe, and Loddon Rivers, formed by fluvial sedimentation. Also crossing the Riverine Plains is an extensive system of dry abandoned stream courses known as prior streams.

West of the Leagur Fault the landscape and soil are very different. Here the Mallee country starts, with its surface cover predominantly of fine sands. Parallel north north-west to south south-east orientated Pliocene beach ridges or dunes which ripple the landscape are the basic landscape element of the Mallee, formed on the margin of a retreating sea. Hollows between these ridges are partly filled by Pleistocene fluviolacustrine clays; the ridges are partly obscured by younger east to west orientated longitudinal dunes, parabolic dunes, and sand plains. Of significance are areas of groundwater discharge such as the gypsum playas and salinas, as exemplified by Lake Tyrrell and the Raak Plains.

The Mallee is the marine plain of the former Murray Basin, with a veneer of wind-blown sands overlying fossiliferous marine Tertiary sands and silts, which reach eastwards to the Gredgwin Ridge on the Avoca-Loddon divide near Kerang. Westward of the Loddon River the streams fail to reach the Murray River and terminate in brackish or saline shallow lakes commonly bordered by lunettes. This is because of the low flow volumes and high rates of evaporation and infiltration.

The Wimmera is essentially the low alluvial fans, alluvial plains, and abandoned river channels lying between the Western Highlands and the Mallee.

Central Highlands

Extending east to west across Victoria is a major complex ridge known as the Central Highlands. In eastern Victoria, it is rugged and mountainous, and with plateau-like features commonly capping elevated mountain areas. Known as the Eastern Highlands, these mountains in eastern Victoria attain elevations of above 1,800 metres at the highest points such as Mt Bogong and Mt Hotham, and elevations of 1,200 metres are common. The major rivers of Victoria with high flow-rates, with the exception of the Glenelg River, all rise in the Eastern Highlands, and characteristically show

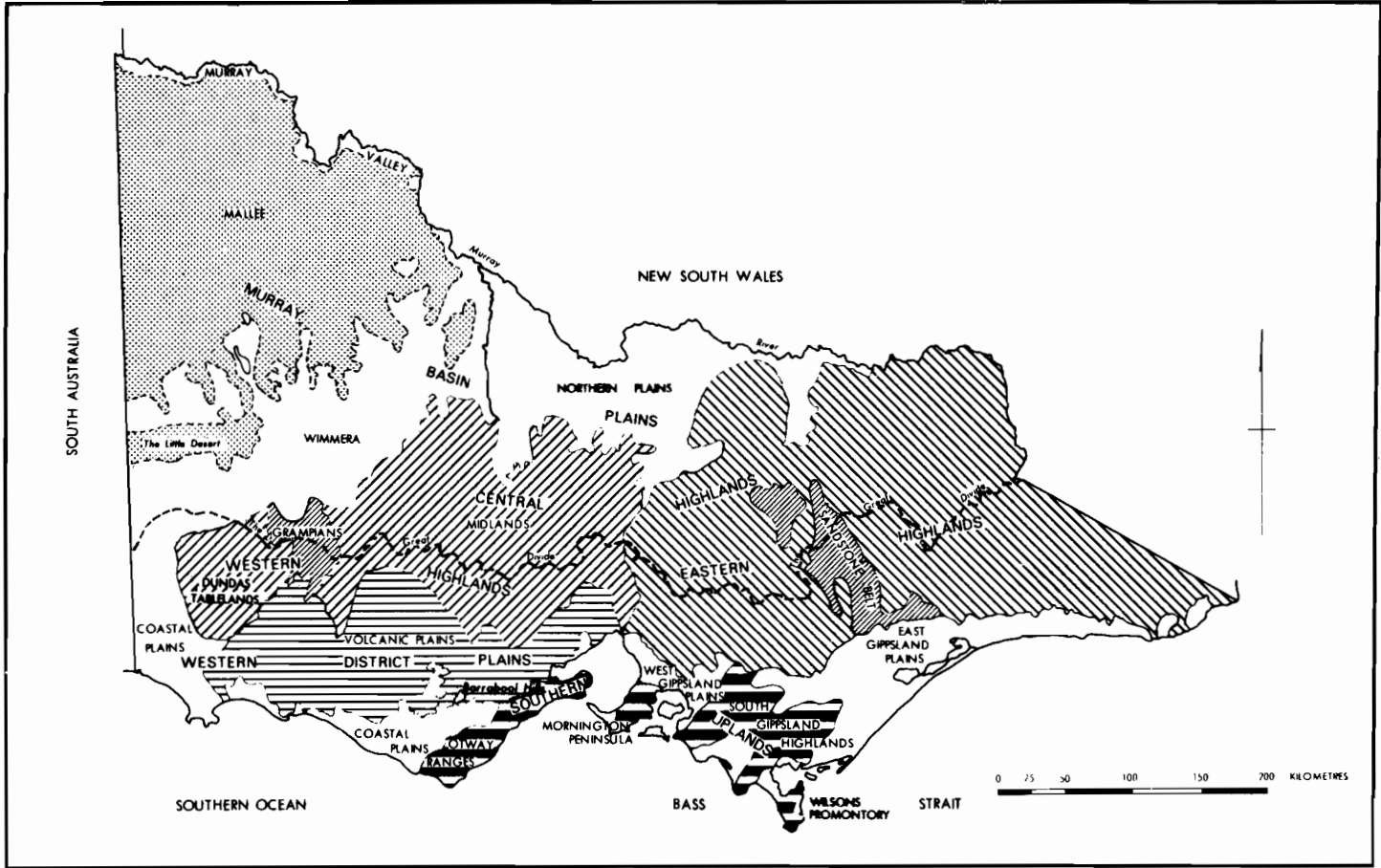


FIGURE 1. Physiographic divisions of Victoria.

steep-sided, deep, and narrow valleys. Residuals of Lower Tertiary basalts occur in the Eastern Highlands, filling old valleys as at the Dargo High Plains and the Bogong High Plains.

The topography of the Eastern Highlands has been strongly influenced by the variety of rock types and structures present. Thus a flat-topped and step-like landscape is found in the hard, almost flat-lying Upper Devonian to Lower Carboniferous sandstones and rhyolites between Briagolong and Mansfield; plateaux are preserved in granite at Mt Buffalo and the Baw Baws; and lower elevations with dendritic drainage are generally seen in areas of folded Lower Palaeozoic sandstones and mudstones.

The Western Highlands, in contrast to the Eastern, are much lower in elevation and are generally subdued hills rather than mountains. Rugged areas are mostly found near fault scarps. The general elevation is about 600 metres at Ballarat, but usually considerably less. Resistant masses of igneous rocks such as Mt Macedon and Mt Cole rise well above the general level, but fall well short of the main peaks in the Eastern Highlands. Extensive flat and only slightly dissected areas of Upper Tertiary to Quaternary basalt cover parts of the Western Highlands, conspicuously in the Ballarat area where they have yielded rich soils, and above the basalt flows rise prominent eruption points such as Mt Warrenheip and Mt Buninyong.

The Grampians, sharp-crested strike ridges of hard sandstone reaching 1,200 metres in height, are prominent mountains rising far above the general level of the highlands which decrease in height westwards. The westerly extremity of the Western Highlands is the Dundas Tablelands, a tilted block extending to Dergholm, formed in contorted Lower Palaeozoic rocks capped with laterite and dissected by the Glenelg River system.

Valleys in the Western Highlands are generally broad rather than deep, except where rejuvenating movements have occurred along fault scarps leading to the formation of gorges in some cases.

The Central Highlands owe their elevation and relief to varied upwarping movements and faulting during Tertiary time.

Western District Plains

The Western District Plains stretch westwards from Melbourne to Camperdown, Hamilton, and Portland. They subdivide naturally into volcanic plains and coastal plains.

Volcanic Plains

With an area of 15,000 square kilometres, the Volcanic Plains are one of the largest volcanic plains in the world. They begin at an east-west line through Colac and Warrnambool and reach northwards to the foot of the Grampians.

The Volcanic Plains are almost horizontal, with only a slight southward inclination, and are composed of Pliocene to Holocene basalt flows and some basaltic ash. The Camperdown area and several other areas show extensive minor irregularities known locally as 'Stony Rises', formed by lava collapse during solidification; these lava flows are so young that they are unmodified by erosion and soil formation. Volcanic cones, frequently of scoria, rise sharply from the plains as at Mt Elephant (394.4 metres) and Tower Hill (98.4 metres), and extensive areas of basalt can be traced to some cones. Much of the scoriaceous basalt of the 'Stony Rises' between Colac and Camperdown can be linked with Mt Porndon (289.2 metres). Lakes in some cones occupy craters formed by explosive vulcanism.

The plains are crossed by some streams such as the Hopkins River with narrow incised valleys, but much drainage is internal, with precipitation finding its way to shallow lakes and underground.

Coastal Plains

Coastal plains extend from Queenscliff to Torquay and from Princetown to Warrnambool and northwards to Colac. They are flat or undulating, and are essentially the uplifted surface of Tertiary sedimentary rocks, including limestones, partly dissected by streams and commonly veneered with Quaternary dune limestone and sands. Some of the limestones beneath the plains are cavernous, and form high yielding aquifers for groundwater. A broad coastal plain, bounded by a fault scarp to the north-east, lies to the west and north-west of Portland.

Gippsland Plains

As a planar surface, the Gippsland Plains begin near Yallourn and Port Albert, and spread eastwards to the Bairnsdale area, between the ocean and the Eastern Highlands. Further east, through Orbost to Cann River, they form coastal downs—a dissected coastal plain—rather than a plain.

The Moe Swamp, Western Port Sunklands, and Powlett Plains (near Wonthaggi) may be regarded as western extensions of the Gippsland Plains, separated by maturely dissected upfaulted blocks.

The present plains are the upper surface of a Tertiary and Quaternary basin, in which thick sequences of marine and freshwater sediments have accumulated, including the major brown coal seams of the La Trobe Valley. The plains are generally covered with piedmont-type sands, sandy clays, and gravels, which originated from the Eastern Highlands during the final late Tertiary movements which elevated them to their present height, and into these gravels the streams have cut broad alluvium filled valleys with flights of terraces that can be traced back into the Highlands.

A former coastline can be recognised behind the present coastline in the Bairnsdale-Lakes Entrance area. The conspicuous Ninety Mile Beach is a barrier bar which has cut off some of the Gippsland Lakes from the sea, and both spits and islands inland from the beach betray a complex history of barrier formation and erosion related to changed sea levels. Present day coastal dunes are prominent along sections of the Ninety Mile Beach, and earlier dunes and beach ridges are found on the barriers; still older dunes are found north of Woodside and east of Stratford.

Southern Uplands

South-west of the Gippsland Plains is a steep mountainous region, the Southern Uplands, formed by upwarping and faulting, and separated from the Eastern Highlands by the westerly extension of the Gippsland Plains appropriately named by J. W. Gregory as the 'Great Valley of Victoria'. These mountains, together with the Barrabool Hills near Geelong and the Otway Ranges, are formed of freshwater Lower Cretaceous sandstones and mudstones, and all display a characteristic rounded topography, due in part to very extensive landslipping and structural weakness in these rocks.

Areas of weathered basalt from the Lower Tertiary are found on the Uplands in plateau-like form at Thorpdale and Mirboo North in South Gippsland, and many smaller remnants are found elsewhere in these ranges; the basalts yield rich soils.

The Otway Ranges similarly originated by upwarping and faulting during Tertiary time.

A further element in the Southern Uplands is the Mornington Peninsula, which is a raised fault block of Palaeozoic granites and sedimentary rocks separating the downwarped Western Port Sunklands and the Port Phillip Sunklands.

Land surface of Victoria

The present topography of Victoria is the result of interaction between various rock types, changes in elevation, and deformation, processes such as weathering and erosion—including climatic effects—and the stage of development reached by these processes. Hard resistant rocks, for example, will after prolonged erosion tend to stand out in relief, whereas softer more weathered rocks will be topographically more depressed. Over extensive periods of geological time without major sea-level changes, erosion will tend to wear down a land mass to a surface of low relief—known as an erosion surface—not far above sea-level. In the highlands of Victoria remnants of several such erosion surfaces can be recognised as plateau-like features raised to elevations of hundreds of metres by uplift.

Jurassic erosion surface

In the Eastern Highlands, plateau remnants are widespread as, for example, the Cobberas, the Mt Hotham area, Mt Buffalo, the Snowy Plains, Mt Wellington, and the Baw Baw Plateau: They are all in hard rocks such as granite, rhyolite, and massive sandstone. These plateau remnants, and ridge tops at similar levels, are relics of the most ancient landscape or erosion surface preserved in Victoria. They are the surviving parts of sub-planar surface which was close to sea-level in Jurassic time, before uplift and warping late in the Jurassic commenced its destruction, and began to form troughs or sedimentary basins in which the sediments represented in the Otways and the South Gippsland Highlands were deposited during Cretaceous time. These upwarps had already begun to define the Central Highlands.

Later evolution

Uplift and downwarping continued intermittently during Tertiary time, with the development of sedimentary basins such as the Murray Basin in north-west Victoria and the Gippsland and Otway Basins in southern Victoria. In the basins was deposited detritus carried down by streams from the rising Highlands, and in swamp conditions thick deposits of brown coal were laid down in the Gippsland Basin. Deep valleys were cut into the Central Highlands, which were then lower than their present height; in some of these valleys gold bearing gravels were deposited. Parts of the landscape and some of the valleys were filled with Lower to Mid-Tertiary basalts.

Erosion proceeded to advanced stages during parts of the Tertiary Period, as attested by remains of younger erosion surfaces, preserved at lower levels than the Jurassic surface on the hill summits immediately east of the centre of Melbourne and around the Dandenong Ranges to Gembrook, on the Kinglake Plateau, and elsewhere in the Central Highlands.

By Miocene time, downwarping movements were at their maximum. Embayments of the sea covered much of Gippsland, the Port Phillip Basin, an extensive area of western Victoria south of Lismore and the Grampians (the Otway Basin), and north of the Grampians the Murray Basin spread as far as Broken Hill, New South Wales. The record of this transgression is left in limestones and other sedimentary deposits. Retreat of the sea towards its present position during the Pliocene was accompanied by further uplift of the Central Highlands, leading to further erosion, valley deepening, and the accumulation of extensive sheets of sands, clays, and gravels both on the lowland plains and as piedmont gravels on the spurs leading down to the lowlands.

The Upper Tertiary and Quaternary saw vast volcanic activity in central and western Victoria. From Melbourne to Hamilton basalts and tuffs were outpoured and ejected. Flows followed pre-existing valleys in the Western Highlands, burying gravels as deep leads in the Ballarat district.

Final downwarpings, assisted by the world wide melting of glacial ice at the end of the Pleistocene, led to the drowning which has given Port Phillip Bay and Western Port Bay their present configurations, and concomitant upwarps in the Central Highlands elevated them to their present level.

Changing climate has played a role in this physiographic evolution. Thus the Mid-Tertiary, with the rich flora evident in the brown coals, appears to have been a time of higher rainfall than at present, which resulted in larger streams with more erosive power. Changing Quaternary climates are also recognised in the changing regimes evident in the former lakes and prior streams of the Riverine Plains.

Hydrology

Water resources

The average annual rainfall over Victoria is about 660 mm. As the area of the State is 227,600 square kilometres, the total precipitation is, therefore, about 148 million megalitres. Only 21 million megalitres appear in the average annual flow of the State's river systems. It is not yet known how much of the remainder soaks underground to recharge groundwater resources, but total storage of groundwater with less than 1,000 parts per million salinity is very large. Groundwater resources are being assessed by a long-term programme of investigation being carried out by the Victorian Department of Industry, Technology and Resources.

Victoria's surface water resources are unevenly distributed in both space and time. Their distribution in space can be conveniently described by considering the State as being divided into four segments, by an east-west line along the Great Dividing Range and a north-south line through Melbourne. The north-west segment contains 40 per cent of the State's area, and the other three segments 20 per cent each. Surface water resources, represented by average annual river flow, are heavily concentrated in the eastern segments, each accounting for approximately 40 per cent of the total. The western segments account for only 20 per cent of total flow, with only 3 per cent in the north-west segment.

Quality of stream flow also deteriorates from east to west. Waters of the eastern rivers mostly contain less than 100 milligrams per litre of total dissolved solids. In the western rivers the figure is generally above 500 milligrams per litre, except near their sources, and increases downstream to in excess of 1,500 milligrams per litre.

River flows in Victoria exhibit a marked seasonal pattern, and marked variability in annual flow from one year to another and from place to place, affecting the usability of the transitory local surface supplies of fresh water.

Over the State as a whole, about 60 per cent of the average annual flow takes place between July and October. In western streams this percentage approaches 75 per cent. Everywhere, flows typically recede in the summer and autumn, at the time of year when water requirements for most uses are at a peak.

Rivers

Topography

The topography of Victoria is dominated by the Great Dividing Range, which extends from a mountainous region in the east, through the narrower and lower central highlands, and terminates at

the Grampians in the west. This divide separates the State and its rivers into two distinct regions: those rivers flowing northwards towards the Murray River and those flowing southwards towards the sea. The only other significant high country within Victoria is formed by the Otways in the south-west and the Strzelecki Ranges in South Gippsland.

Geography

Of all the major Victorian rivers, the Snowy River is the only stream not wholly situated within the State, the headwaters of this river being in the Snowy Mountains of New South Wales. The Murray River, although an important water supply source for Victoria, is legally wholly in New South Wales as the State boundary coincides with the southern bank of this stream. (See page 26.)

Of the major northern rivers, all except three flow into the Murray River. The three exceptions—the Avoca, Richardson, and Wimmera Rivers—finish their course at inland lakes in the Wimmera-Mallee region, with the Avoca River, on rare occasions, overflowing its lakes system to reach the Murray River.

Of the major southern rivers, the La Trobe, Thomson, Macalister, Avon, Mitchell, and Tambo Rivers all flow into the Gippsland Lakes system, which is linked with the sea by an artificial cut constructed in 1888 for navigation purposes. The Woody-Yallock River in the west flows to the inland Lake Corangamite, while the remaining southern rivers find their way directly into the sea.

Water availability

The eastern rivers of Victoria, both northerly and southerly flowing and those rising in the Otway Ranges, have their sources in high rainfall country and provide abundant water resources, while those in the western portion of Victoria, with the exception of the Glenelg River, have limited useful yield and many are frequently dry in summer. In fact, the vast majority of Victoria's available water resources originate in the eastern half of the State.

Physical properties

The actual physical properties of Victorian rivers differ markedly from the east to the west. Rivers in the far east to north-eastern regions of Victoria flow for most of their journey through mountainous terrain in deep gorges, and then into flood plains, before reaching either the Murray River or the sea. Heavy shingle has been scoured from the bed and banks of these fast flowing mountainous streams and finally deposited downstream in the plain area. The water of these streams is clear and free from excessive suspended mud and silt.

Rivers in central and western Victoria, on the other hand, have comparatively short mountainous sections, and for the majority of their length wander sluggishly through undulating to flat country. Velocities of flow are far less than for their mountainous counterparts, and material carried by these streams consists of fine silt and clay which causes the muddy turbid waters, typical of these central and western rivers.

For those rivers that flow to the sea, there is a tendency at the river mouth to form sand spits and dunes, with the consequent obstruction of the mouth. Some of the smaller streams become blocked entirely and breach only in times of flood.

Salinity

Rivers in the Eastern Highlands, flowing mainly through heavily timbered mountain tracts, generally have very good quality water suitable for all purposes. In the lower Central Highlands, salinities vary from stream to stream but generally flows are fresh in the winter and spring and slightly saline in the summer and autumn. In the south-west regions of Victoria, catchments consist mainly of grasslands, with scrub regions in the north-west, and streams here are slightly to moderately saline for most of the year.

Flooding

Rainfall throughout Victoria is erratic during the year and hence the majority of the State's rivers are prone to flooding at any time, with rivers in Gippsland often subject to summer flooding. Flooding problems on a number of major streams have been markedly reduced by the construction of dams which, although designed for the supply of water and not for flood mitigation, provide substantial temporary storage above the full water supply level.

MAIN STREAM FLOWS, VICTORIA

Stream	Location	Annual volumes (^{'000} megalitres)			No. of years observed	Area above station (kilometres)	Total length (kilometres)
		Max.	Min.	Mean			
NORTHERN RIVERS							
Murray	Jingellic	6,470	732	2,520	65	6,527	2,560
Mitta Mitta	Tallandoon	3,860	354	1,250	50	4,716	219
Kiewa	Kiewa (main branch plus anabranch)	1,580	195	584	47	1,145	184
Ovens	Wangaratta	2,880	195	1,120	98	5,138	227
Broken	Goorambat (head gauge)	678	7.79	242	96	1,924	192
Goulburn	Goulburn Weir	4,570	121	1,340	17	10,627	563
Loddon	Laanecoorie	742	8.11	237	93	4,183	392
Avoca	Coonooer	408	0.43	85.90	95	2,668	269
Wimmera	Horsham	570	—	138	95	4,066	290
SOUTHERN RIVERS							
Snowy	Jarrahmond	5,930	159	1,730	62	13,421	162
Tambo	Swifts Creek	342	8.87	94.60	37	943	198
Mitchell	Glenaladale	2,420	209	932	47	3,903	250
Thomson	Cooper Creek	765	74.60	337	55	906	208
Macallister	Glenmaggie	1,500	48.10	459	65	1,891	201
LaTrobe	Rosedale (main branch plus anabranch)	2,920	447	999	48	4,144	250
Bunyip	Iona	175	29.40	102	22	697	63
Yarra	Warrandyte	1,440	128	729	75	2,328	245
Maribymong	Keilor	342	5.86	111	76	1,303	182
Werribee	Melton Res.	307	5.22	85.40	48	1,155	123
Moorabool	Batesford	217	1.59	71.30	76	1,114	152
Barwon	Inverleigh	326	7.14	133	23	1,269	187
Hopkins	Wickliffe	129	0.56	34.30	64	1,347	280
Gleneel	Dartmoor	1,630	38.80	636	36	11,914	454

Lakes

Lakes may be classified into two major groups: those without natural outlets which are called closed lakes, and those with a natural overflow channel which may be termed open lakes. For closed lakes to form, annual evaporation plus infiltration must exceed the rainfall in the catchment; this is the case over most of Victoria.

Closed lakes occur mainly in the flat western part of the State. They fluctuate in level much more than open lakes and frequently become dry in dry seasons. For example, Lake Tyrrell in the north-west is usually dry throughout the summer and can consequently be used for salt harvesting.

The level of water in an open lake is more stable because as the lake rises the outflow increases, thus governing the upper lake level and partially regulating streams emanating from it. This regulation enhances the economic value of the water resources of open lakes, but Victoria does not possess any natural large lake-regulated streams. However, there are small streams of this type in the Western District, such as Darlots Creek, partly regulated by Lake Condah, and Fiery Creek by Lake Bolac.

Salinity is often a factor which limits the use of lake water; even freshwater lakes are not used extensively in Victoria due to the cost of pumping. The average salinity of closed lakes covers a wide range depending upon the geological conditions of the catchments and the water level.

Lake Corangamite is Victoria's largest lake. It can be regarded as a closed lake, although during the wet period in the late 1950s it rose to within 1.2 metres of overflowing. The total salt content of the lake is about 16.32 million tonnes, giving it a salinity somewhat higher than seawater under average water level conditions.

The Gippsland Lakes are a group of shallow coastal lakes in Eastern Victoria, separated from the sea by broad sandy barriers bearing dune topography, and the Ninety Mile Beach. A gap through the coastal dune barrier near Lakes Entrance, which was completed in 1888, provides an artificial entrance to the lakes from the sea. However, seawater entering this gap has increased the salinity of some lakes, which in turn has destroyed some of the bordering reed swamp and led to erosion. The Gippsland Lakes have been of value for commercial fishing and private angling and also attract many tourists.

A number of Victorian lakes and swamps have been converted to reservoirs. Waranga Reservoir is an example of this, as are Lake Fyans, Batyo Catyo, and Lake Whitton in the Wimmera. A good example of lake utilisation is the Torrumbarry irrigation system on the riverine Murray Plains near Kerang in north-west Victoria.

Groundwater resources

Groundwater resources move slowly through pores and cracks in soil and rock and respond sluggishly to seasonal and annual fluctuations in recharge. For this reason, groundwater can be regarded as a generally more reliable source of water through drought periods. However, mapping of resources in terms of depth, yield, and quality is much more complex than the mapping of visible surface resources.

The present position, very broadly stated, is that there are groundwater resources of reasonable quality and yield for domestic and irrigation purposes over about 4,000,000 hectares or about one-sixth of Victoria's area, mainly in the far west and south-west and in alluvial valleys in the north and south-east.

On the other hand, there is about half the State's area, in the central and western sectors, where groundwater is generally not available at qualities better than 3,000 parts per million of total dissolved solids.

Groundwater has played a very important part in providing supplies of water for domestic and stock use in pastoral settlement. It is also used for some isolated town supplies, and is being increasingly used for irrigation; the area irrigated from groundwater is approximately 12,000 hectares.

For the future, there are prospects of generally increased use for irrigation, and for the augmentation of town water supplies on the south-west coast, in the Barwon Valley, and in Gippsland. However, these prospects can only be clarified by continuing investigation.

Additional information can be found in the publications entitled *Groundwater Investigation Program Reports, 1971-1985* which were issued by the Victorian Department of Minerals and Energy. Subsequent issues of this publication have been issued by the Department of Industry, Technology and Resources.

CONSERVATION AND THE ENVIRONMENT

Department of Conservation, Forests and Lands

Organisation

Organisational changes initiated by the Victorian Government in 1982 led to the formation of the new Department of Conservation, Forests and Lands. The background to these changes was reported in the *Victorian Year Book* 1985. A further move took place in March 1985, when, as part of government changes announced by the Premier, the Division of Survey and Mapping was transferred to the Department of Property and Services.

Public land in the Crown estate occupies 8,786,000 hectares (approximately 39 per cent) of the total area of Victoria (22,760,000 hectares). Alienated land covers an area of 13,974,000 hectares.

The Department manages practically all of Victoria's Crown lands and their living terrestrial and aquatic resources for a complex range of existing and potential uses. This involves the management and protection of Crown land including that categorised as national, State, and regional parks, and State forest and wildlife reserves.

AREAS OF CROWN LAND MANAGED, VICTORIA, AT 30 JUNE 1985 ('000 hectares)

RESERVED LAND	
Reserved forest under the Forests Act	2,744
Parks under the National Parks Act	1,151
Special purposes under the Crown Land Act	689
Total	4,584
UNRESERVED LAND	
Including land occupied under licence and land set aside for roads	4,202
Total Crown land	8,786

In the case of soil conservation and control of vermin and noxious weeds, the Department is also responsible for protection of private land. In addition the Department manages resources in those

marine areas which are under State control. The Department's overall role involves utilisation of land-based, aquatic, and marine resources on the one hand along with their long-term conservation and protection on the other.

Structure and operation of the Department

The Department is a highly regionalised organisation with eight major divisions and eighteen relatively autonomous regions which cover the State. The roles of the four functional divisions, namely, National Parks Service; State Forests and Lands Service; Fisheries and Wildlife Service; and the Land Protection Service, are referred to in the following paragraphs. Other divisions of the Department are: Economics, Policy Co-ordination and Strategy, and Corporate Services, which provide the co-ordination and internal services required for the Department's effective operation and administration.

National Parks Service

The Service is a head office division responsible for the preparation of State wide policies, programmes, plans, and standards relating to the use, conservation, and protection of parks and reserves designated under the National Parks Act. This currently represents close to 70 parks and reserves with a combined area of approximately one million hectares. The Service is also responsible for monitoring the management of these parks.

For further information on the National Parks Service, see pages 40-3 of the *Victorian Year Book* 1985.

State Forests and Lands Service

The State Forests and Lands Service is a head office division responsible for the preparation of State wide policies, programmes, plans, and standards relating to the use, conservation, and protection of public lands of the State. It also monitors the management of these lands. The Service is also responsible for the management of the Royal Botanic Gardens and the National Herbarium.

Fisheries and Wildlife Service

The Fisheries and Wildlife Service is a head office division responsible for the development of State wide policies, programmes, plans, and standards relating to monitoring the condition of fish, wildlife, and their environments, and for developing strategies for their conservation and protection.

This Service protects fish and wildlife; regulates the use of these resources, and is concerned with their habitat. Management is based on such factors as species distribution, abundance, or status and the main focus of effort is usually upon species which are of recreational or commercial importance, or are considered to be under threat.

Land Protection Service

The Land Protection Service is responsible for the protection of public and private land from problem plants, animals, and insects; conservation of soil; catchment protection; and tree growing on private land.

From head office, State wide policies, programmes, plans, and standards are developed relating to monitoring the condition of public and private land and strategies are framed for their conservation and protection.

The Service is also responsible for the policy aspects of land protection, for research, for provision of technical advice and assistance to land managers and the public, and for planning.

Regional Management Division

The Regional Management Division is responsible for implementation and control of programmes undertaken in the Department's eighteen regions. Field staff of the former divisions (for instance, national parks rangers, foresters, fisheries and wildlife officers, and soil conservation officers) have been integrated into regional structures; staff of the 'functional arms' remaining in head office are now responsible for policies and plans, monitoring implementation, and providing technical advice, as distinct from the day to day management tasks in national parks, State forests, etc. The head office of Regional Management Division prepares, supports, and has oversight of regional programmes, and the allocation of physical resources to those programmes.

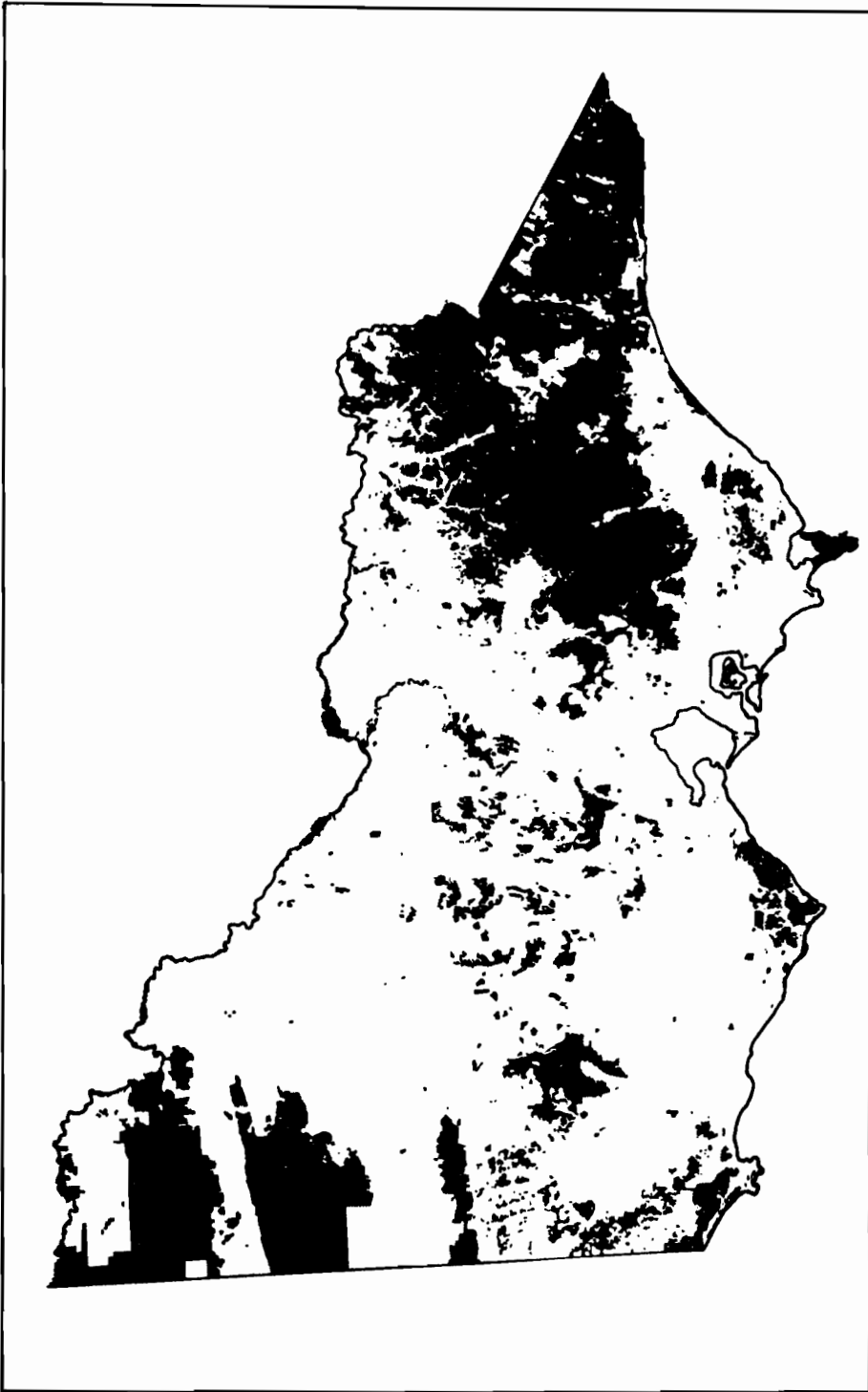


FIGURE 2. Public land of Victoria.

Statistics

The total expenditure of the Department for 1984-85 was \$174.1m, while revenue received was \$71.3m. Forest royalties represented over forty-eight per cent of revenue received.

During 1984-85, management of Victoria's public land and its associated resources and provision of services to private lands was carried out by a staff of 4,355 (at 30 June 1985) from approximately 150 offices and 350 depots and workshops throughout Victoria.

At 30 June 1985 approximately sixty-six per cent of the Department's staff establishment were regionally based.

Environment Protection Authority

The Environment Protection Authority (EPA), constituted under the *Environment Protection Act* 1970, is a pollution control agency responsible for protecting and improving air, land, and water environments through management of wastes, control of noise, and prevention of pollution. Important changes to the Environment Protection Act came into effect on 1 July 1984, and 1 January 1985. The EPA now has wider powers to control pollution. Major features of this Act include the introduction of a works approval system and the licensing of 'scheduled' premises rather than individual discharges.

Major activities centre on assessment and management of air and water quality, wastes on land, and waste control systems. The EPA is also concerned with environmental noise, in particular industrial, traffic, and entertainment noise. Control mechanisms include licensing, pollution abatement notices, noise control notices, and works approvals.

Environmental planning is achieved through State Environment Protection Policies, which are developed by the EPA in draft form, issued for public review, and recommended to the Victorian Government for declaration. These policies set environmental objectives and provide the statutory framework for pollution control. At November 1985, the EPA had nine proclaimed water policies relating to particular catchments, a comprehensive air policy applying to the Victorian airshed, and a noise policy for industrial and commercial premises within the Melbourne metropolitan area.

Land Conservation Council

The primary function of the Land Conservation Council is to carry out investigations and make recommendations on the balanced use of public land in Victoria. For this purpose the Council has divided Victoria into seventeen study areas. It plans to complete its first round of investigations in 1986 with the submission of final recommendations for the Wimmera area to the Victorian Government. A map of these study areas can be found on page 39 of the *Victorian Year Book* 1985.

The Council may also be directed by the Victorian Government to carry out special investigations of areas of public land. Five such investigations have been conducted so far. In addition, reviews of two areas have been completed, and the Council is currently reviewing the Melbourne area, District 1, and the Mallee area, and plans to complete its review of the East Gippsland area in 1986.

In carrying out investigations, the Council is required under the *Land Conservation Act* 1970 to take into account the present and future needs of the people of Victoria in relation to:

- (1) preservation of ecologically significant areas;
- (2) conservation of areas of natural interest, beauty, or historical interest;
- (3) creation and preservation of areas of reserved forest, areas for leisure and recreation, and reserves for the conservation of fish and wildlife;
- (4) preservation of species of native plants; and
- (5) land required by government departments and public authorities in order to carry out their functions.

In the sixteen years since its inception, one important effect of the Council's recommendations has been to increase substantially the area of Victoria permanently reserved for conservation purposes. This has been achieved mainly through a system of national and State parks dedicated for conservation, recreation, and education purposes. The Council has also established other categories of land-use primarily for conservation, or low intensity recreation or education. These include reference areas; wilderness areas; marine reserves; natural features and scenic reserves; flora reserves; flora and fauna reserves; bushland reserves; coastal reserves; river, stream, and lake reserves; education areas; and historic areas.

At the time of establishment of the Council in 1971, there were twenty-two national parks in Victoria covering some 0.86 per cent of the State. Since that time the Council's recommendations, as accepted by the Victorian Government, have resulted in many of the existing parks being enlarged,

new parks created, and two wilderness areas established. The following table shows the land-use categories and areas recommended to be set aside. It includes recommendations for sixteen of the seventeen areas and districts into which the State has been divided. Special investigations and reviews have also been incorporated. In all, the Council has made some 4,300 recommendations, and the Victorian Government has approved all but about 60 for implementation.

As well as its role in preserving areas of special conservation significance, the Council has a responsibility to ensure that sufficient natural resources are available to meet the current and future needs of the community. One of the most important resources affected by the Council's recommendations is timber. Throughout rural Victoria the timber industry is an integral and often principal component of the total regional economy and many rural communities rely heavily on the timber industry for their economic viability. The Council has also recommended smaller areas for agriculture, mining, and public utilities.

A more comprehensive description of the functions and procedures of the Land Conservation Council is provided in previous editions of the *Victorian Year Book*.

RECOMMENDED PUBLIC LAND USE, VICTORIA, 1985

Land-use category	Area in portion of State investigated	Percentage (a)	
		State	Crown land
	'000 hectares		
National parks (b)	1,189.3	5.2	13.5
State parks	324.5	1.4	3.7
Regional parks	69.0	0.3	0.8
Coastal parks (c)	41.7	0.2	0.5
Multi-purpose parks	59.1	0.3	0.7
Reference areas	77.2	0.3	0.9
Wilderness	152.7	0.7	1.7
Flora, and flora and fauna reserves	78.7	0.4	0.9
Wildlife	95.2	0.4	1.1
Natural features and scenic reserves (d)	67.0	0.3	0.8
Education	16.3	<0.1	0.2
Historic areas and reserves	40.0	0.2	0.5
Streamside reserves	8.8	<0.1	0.1
Lake reserves	81.5	0.4	0.9
Marine parks	52.8	0.2	0.6
State forest (e)	4,511.3	19.8	51.4
Softwoods (f)	106.1	0.5	1.2
Agriculture	99.6	0.4	1.1
Minerals and stone (g)	6.9	<0.1	<0.1
Miscellaneous services and utilities (g)	49.7	0.2	0.6
Water production (g)	203.2	0.9	2.3

(a) Percentages in the table do not add to 100 per cent as one study area is not included and substantial areas — such as road reserves, water frontages, land in townships, land held under perpetual lease, coastal reserves, etc. — have been included only in part.

(b) The park categories reflect the Council's recommendations with the exceptions that Lind, Alfred, and The Lakes national parks are included.

(c) Includes Gippsland Lakes reserves.

(d) Includes caves, and geological and bushland reserves.

(e) The Council has recommended that in future uncommitted land and reserved forest, except that used for softwood production, be reserved as a single land-use category known as State forest.

(f) Estimate of net area planted or recommended to be planted. The Council has indicated a further 23,000 hectares net of uncommitted land could be used, should the Victorian Government decide further areas of forested public land are required.

(g) Substantial areas used for these and other miscellaneous purposes are not included.

Survey and mapping

The Division of Survey and Mapping of the Department of Property and Services is responsible for the National Geodetic Survey within Victoria, the preparation of topographic maps, the survey of Crown lands under the provisions of the *Land Act* 1958, the co-ordination of surveys under the provisions of the *Survey Co-ordination Act* 1958, surveys for other departments and authorities, and the documentation of these surveys.

A complete reference to all plans and surveys in Victoria is contained in the Central Plan Office. The Map Sales Centre provides facilities for the public to inspect and purchase maps and aerial photography.