12   Natural Resources and Environment

Introduction

This chapter contains information about the Victorian environment and natural resources, and the impact that society may have on them. It includes information about peoples' concern for environmental problems, natural resources (such as, air, water and land), and action taken by households to help preserve the environment.

The data in this chapter is sourced from the Victorian Department of Natural Resources and Environment, Environment Protection Authority, EcoRecycle Victoria, Melbourne Water Corporation, Marine Board of Victoria, Parks Victoria, Bureau of Rural Sciences, State of the Environment Council, National Heritage Trust, and from surveys conducted by the ABS.

The health of the environment not only affects the quality of life experienced by people, it also determines the availability of the basic resources; air, water and land, which are essential for life.

Concern for environmental problems

The number of Victorians indicating concern about environmental problems has declined over a ten year period, from 75.2% in 1992 to 61.2% in 2001 (table 12.1). This reflects an Australian-wide trend, and may be partly explained by people's view on the quality of the Australian environment as having improved or stayed relatively the same over the past ten years. This change in attitude contradicts evidence which suggests that, during the 1990s, many of Australia's environmental problems worsened (State of the Environment Council 1996).

Despite this, at March 2001, a total of 262,400 Victorians (7.6% of the adult population) had registered an environmental concern over a 12 month period. Table 12.2 shows the methods by which these people expressed their concern, the most common being through a signed petition, letter, and telephone.

12.1   PERSONS CONCERNED ABOUT ENVIRONMENTAL PROBLEMS(a)

	Yes	No	Don't Know
	%	%	%
May 1992	75.2	22.2	2.6
June 1994	67.2	30.5	2.2
April 1996	70.5	27.7	1.8
March 1998	70.7	28.1	1.2
March 2001	61.2	34.8	4.0

(a) Proportions are of all adults aged 18 years and over.

Source: Environmental Issues: People's Views and Practices (Cat. no. 4602.0).

12.2   METHOD OF REGISTERING ENVIRONMENTAL CONCERNS(a)

	March 1998	March 2001
	%	%
Letter	29.4	33.9
Telephone	25.9	31.9
Demonstration	*4.9	*6.4
Signed petition	40.4	34.0
Other	19.6	25.7

(a) More than one method may be specified.

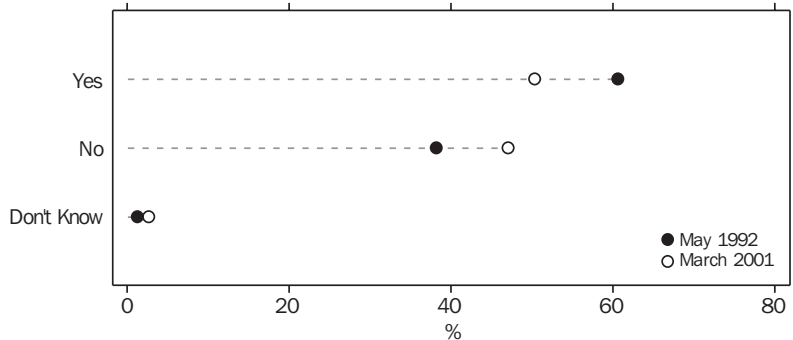*Source: Environmental Issues: People's Views and Practices (Cat. no. 4602.0).*

Use of World Heritage Areas, National and State Parks

Countries that subscribe to the World Heritage Convention are required to protect and conserve the natural and cultural properties entered in the World Heritage List for the benefit of current and future generations. Although the Australian Government is required to act in accordance with its international obligations to conserve World Heritage properties, existing land uses can continue so long as they do not threaten the natural and cultural values of the property. In Australia, including External Territories, there are currently 15 World Heritage sites although there are none listed for Victoria.

National and State Parks were first established in the 1970s with the aim of protecting specific scenic or natural features. The legislation governing parks and reserves (*National Parks Act 1975* Vic and *Crown Land Reserves Act 1978* Vic), recognises and details the different management objectives that cover these protected areas.

In March 2001, the proportion of adult Victorians reporting that they had visited a World Heritage Area, National or State Park had decreased from 60.6% in May 1992 to 50.3% in March 2001 (graph 12.3). Victorians are among the least likely of all Australians to visit a World Heritage area or Park. The principle reason cited for not visiting a World Heritage Area or Park was lack of time, followed by reasons due to age, health or inability (graph 12.4).
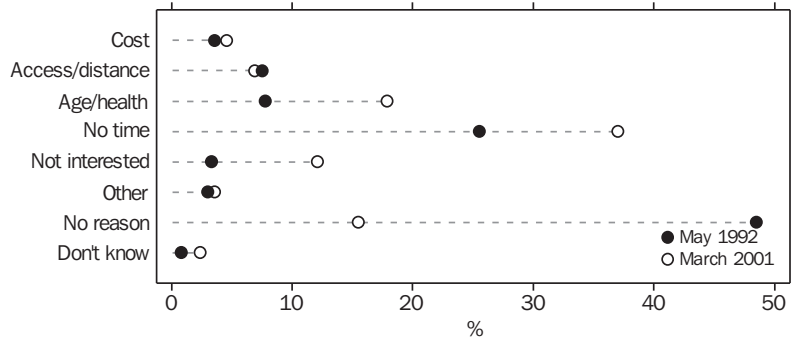
12.3   VISITED A WORLD HERITAGE AREA OR PARK — 1992 and 2001(a)

Note: (a) Proportions are of all adults aged 18 years and over.

Source: Environmental Issues: People's Views and Practice (Cat. no. 4602.0).

12.4   PERSONS NOT VISITING A WORLD HERITAGE AREA OR PARK, MAIN REASON(a)

Note: (a) Proportions are of all adults aged 18 years and over

Source: Environmental Issues: People's Views and Practices (Cat. no. 4602.0).

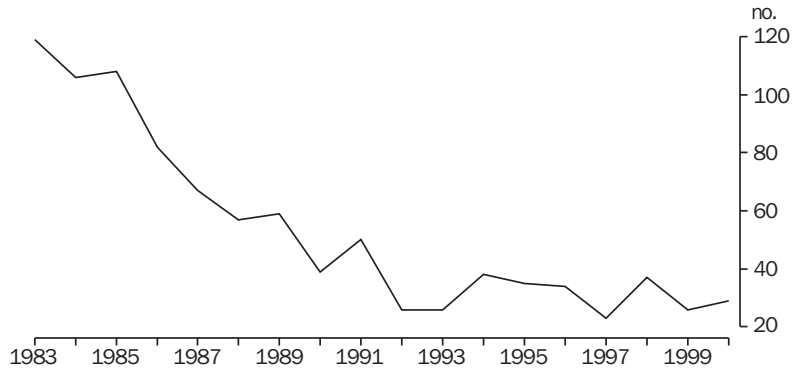# Natural environment

Air pollution

Air quality has improved over the past 25 years in Victoria, but remains a priority concern. Almost half of Melbourne's air pollution is caused by emissions from vehicles. Whilst the air quality in regional Victoria is generally good, odours, smoke and localised chemical emissions can cause concern in some areas.

The Environment Protection Authority (EPA) routinely monitors air quality in two priority regions within Victoria, the Melbourne–Geelong airshed (Port Phillip Region) and the Latrobe Valley airshed. Objectives are set in the *State Environment Protection Policy (SEPP) — Ambient Air Quality* for common pollutants: carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide, lead, particles as PM_{10} (i.e. particles with an equivalent aerodynamic diameter of 10 micrometres or less) and visibility-reducing particles.

Victoria's air is generally clean and in an international context Melbourne's air quality is relatively good. In the year 2000, carbon monoxide, nitrogen dioxide, sulfur dioxide and lead levels met the environmental quality objectives set in the *State Environment Protection Policy (SEPP) — Ambient Air Quality*.

Ozone and visibility-reducing particles still cause concern within Victoria, although limits were exceeded on only a few occasions. In 2000, there were no breaches of 1–hour and 4–hour ozone objectives (set to protect human health), with only the 8–hour objective (set to protect vegetation) being breached. Ninety-three percent of days in the year 2000 were below the SEPP objective for visibility-reducing particles (an aesthetic standard). There has, however, been a long-term improvement in attainment of the SEPP objectives for these pollutants (see graph 12.5 for visibility trend). Improvements are a direct consequence of controls placed on industry, motor vehicles and backyard burning.

12.5   VISIBILITY EXCEEDENCES IN THE MELBOURNE–GEELONG AIRSHED

Source: Environment Protection Authority, Victoria.

Greenhouse gases

Greenhouse gases trap the heat from the sun in the atmosphere and maintain the earth's temperature at a level suitable for life — this is referred to as the 'natural' greenhouse effect. Since the Industrial Revolution, human activities — particularly the burning of fossil fuels (coal, oil and natural gas) and land clearing, have increased the atmospheric concentrations of these gases, leading to global warming and climate change due to an 'enhanced' greenhouse effect.

In its 3rd Assessment Report, the Intergovernmental Panel on Climate Change (IPCC) concluded that there is new evidence that most of the warming that has occurred over the past 50 years is attributable to human activities. The IPCC projects that globally averaged surface temperature will increase by 1.4 to 5.8°C by 2100 relative to 1990; sea levels will rise; and rainfall patterns change. The possible impacts of global warming include: potentially irreversible damage to some natural systems; increased frequency of floods and storms; and the spread of weeds, pests and diseases, which in turn, may adversely affect agriculture and human health.

The major greenhouse gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and the perfluorocarbons CF_4 and C_2F_6.

Greenhouse gas inventories present data on emissions of greenhouse gases, and on the removal of these gases from the atmosphere by 'carbon sinks' (growing plants absorb CO_2 during photosynthesis, resulting in its removal from the atmosphere — human activities that contribute to carbon sinks include tree planting and pasture improvement in agriculture). These inventories can assist in identifying priorities for emission reduction actions and in assessing the effectiveness of those actions. State greenhouse gas inventories are generally prepared every five years by the National Greenhouse Gas Inventory Committee — the most recent being for the year 1995. However, as part of its program to develop a new Victorian Greenhouse Strategy, the Victorian Government funded the preparation of a Victorian Greenhouse Gas Inventory (VGGI) for 1999.

The VGGI shows that in 1999, Victoria contributed 21.3% of Australia's total net greenhouse gas emissions (including emissions from land clearing).

Victoria's total net greenhouse emissions increased by 15.9% from 1990 to 1999 (table 12.6). Stationary energy is the largest single source of Victoria's greenhouse gas emissions, contributing 71.7% of net emissions in 1999. It was also a significant contributor to the growth of emissions in Victoria between 1990 and 1999, its emissions increasing over this period by almost one-third.

The transport and agricultural sectors also constitute significant sources of Victoria's greenhouse gas emissions, contributing around 16.1% and 12.6% respectively to the State's total net emissions. The transport sectors also contributed significantly to the total growth in emissions between 1990 and 1999, increasing by 12.6%.

12.6   NET GREENHOUSE GAS EMISSIONS BY SECTOR

|	1990	1999	
	Megatonnes CO_2–equivalent	Megatonnes CO_2–equivalent	Percentage change 1990–1999
Energy			
Stationary(a)	61.4	80.9	31.7
Transport(b)	16.2	18.2	12.6
Fugitive(c)	4.5	3.0	–33.4
Industrial processes(d)	3.4	1.6	–52.9
Agriculture(e)	14.6	14.2	–2.7
Forestry and other(f)	–13.0	–11.6	–11.0
Land clearing(g)	6.3	2.5	–60.1
Waste(h)	4.0	3.9	–1.0
Total	**97.3**	**112.8**	**15.9**

(a) Electricity generation, petroleum refining, and direct use of fuels (e.g. gas). (b) Motor vehicles, rail, aviation, and shipping. (c) Exploration, processing and distribution of oil and natural gas. (d) Production of iron and steel, aluminium, nonmetallic mineral products, and food and beverages. (e) Emissions from livestock, the application of nitrogenous fertilisers, and the burning of grasslands and agricultural residues. (f) Emissions of CO_2 and other greenhouse gases due to forest harvesting, prescribed burning and wildfires, and removal of CO_2 from the atmosphere due to forest growth and pasture improvement. (g) Emissions of greenhouse gases from soil disturbance and from the decay and burning of vegetation following land clearing. (h) Emissions from landfills and wastewater treatment.

Source: Victorian Department of Natural Resources and Environment, 1999 Victorian Greenhouse Gas Inventory (2002).

An alternative method for considering greenhouse gas emissions is to conduct an 'end use analysis' which identifies the amount of greenhouse gas emissions according to various end use activities. When considered this way, electricity emissions and the emissions associated with the production and distribution of petroleum fuels and natural gas are allocated to end users such as the manufacturing, commercial and residential sectors.

The most recent end use analysis was undertaken using 1995 Victorian greenhouse inventory data. This showed that the manufacturing sector accounted for the greatest proportion of Victoria's greenhouse gas emissions in 1995, contributing 29.1% (graph 12.7). This was followed by primary production (agriculture, forestry, fishing and mining) with 18.6% and residential energy use at 17.7%. The transport sector accounted for 17.0% of emissions, the bulk of which (72.9%) was from passenger transport.

12.7   SHARE OF EMISSIONS BY END USE ACTIVITY, 1995
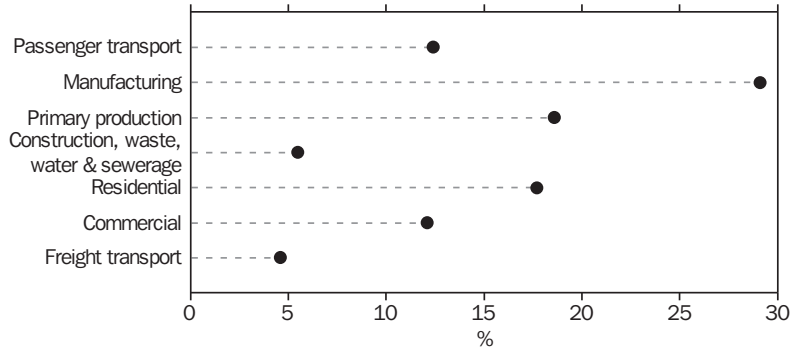
Source: Victorian Department of Natural Resources and Environment
Victorian Greenhouse Strategy discussion paper 2000.

Inland water

Fresh water resources are of major environmental and biological importance because water is a basic life support system for people and ecosystems. Wise and efficient management of water resources is vital in terms of the quantity and quality of available water.

In June 2001, Melbourne's water storage system, managed by Melbourne Water, was only 49.0% full (holding 869,629 megalitres or 869.6 GL of a total useable capacity of 1,773,000 megalitres or 1773.0 GL). As a result of continued dry conditions, the level of Melbourne's water storage has steadily decreased since 1996–97 (graph 12.8). In May 2000, and in June 2001, water storages fell to a level that almost necessitated the imposition of Melbourne-wide restrictions on water use in accordance with the Melbourne Drought Response Plan (the imposition of water restrictions is based on existing levels of water in the catchments, the amount of rainfall, weather conditions and customer demand).

Water storage levels in Rural Water Authority (RWA) areas also showed similar monthly trends with levels significantly declining in April 2000 to be only 28.8% full (2,811,731 megalitres or 2811.7 GL of a total useable capacity of 9,773,495 megalitres or 9773.5 GL)(graph 12.9). Severe water restrictions were imposed in many country areas during this period, and are still in effect in the Wimmera Mallee district. Storage levels increased again between June and December 2000, peaking in November 2000 (6853,315 megalitres or 6853.3 GL).

12.8   WATER STORAGE, MELBOURNE
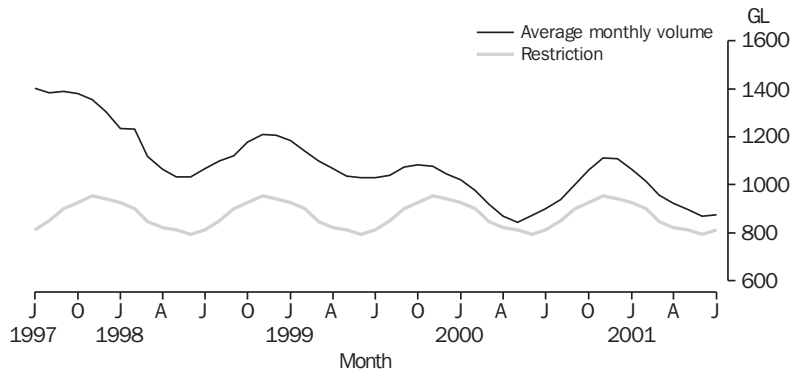
Source: Melbourne Water Corporation.

12.9   RWA WATER STORAGE, VICTORIA(a)
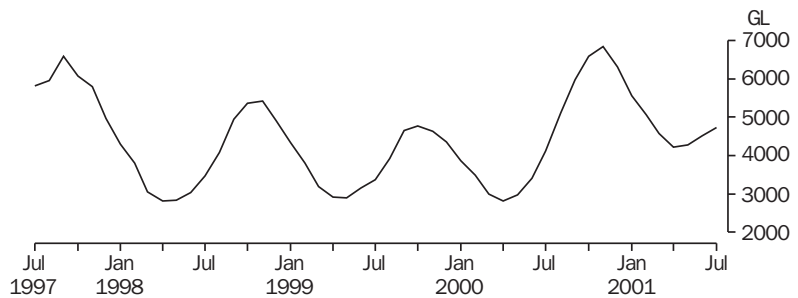
(a) RWA=Rural Water Authorities. The total volume in RWA storages is calculated (as an approximation) as the sum of volumes in store for all listed storages, minus the volume in Thomson reservoir, minus half of the volumes stored in the Murray Basin.

Source: Victorian Department of Natural Resources and Environment.

Marine

There were 100 marine pollution incidents reported during 2000–01 throughout Victoria (table 12.10). The majority of these occurred within the Port Phillip Region. The incidents included spills from vessels, pollutants being carried into the marine environment via drains and other means, and grounding of vessels. The majority of incidents involved spillage of oil, but other chemical spills have also been reported and some incidents did not involve any spillages.

12.10   MARINE POLLUTION INCIDENTS REPORTED

	1998–99	1999–2000	2000–01
	no.	no.	no.
Port Phillip Region	70	73	88
Western Port Region	4	10	5
Gippsland Region	11	9	2
Portland Region	1	4	5
Total	**86**	**96**	**100**

Source: Marine Board of Victoria, Annual Report.

Biodiversity

The 2001 Victorian Yearbook provided a synopsis of Victoria's biodiversity, our biological heritage of the variety of life forms — the different plants, animals, and micro-organisms, the genes they contain, and the ecosystems of which they form a part. Victoria supports 3,140 native species of vascular plants, 111 mammals, 477 birds, 46 freshwater and 600 marine fish, 133 reptiles and 33 amphibians. In addition, 900 lichens, 750 mosses and liverworts, and an untold number of invertebrates, fungi and algae occur within hundreds of ecological communities across the terrestrial, freshwater and marine environments.

Biogeographic regions (called bioregions) capture the patterns of ecological characteristics in the landscape or seascape and provide a natural framework for recognising and responding to biodiversity values. As bioregions reflect underlying environmental features, they can also be related to the patterns of use of land and sea. Victorian bioregions form part of a national framework for terrestrial and marine environments called IBRA (Interim Biogeographic Regionalisation of Australia). Currently, 27 terrestrial and 5 marine bioregions have been recognised for Victoria.

The species and communities occur in habitats spread across Victoria's land and waters, and it is vitally important for scientific management of these resources that our spatial knowledge bases are systematically recorded. Over the last 20 years, the Flora and Fauna program of DNRE has established biodiversity databases that allow land and water managers and the community to better understand the distribution and abundance of our flora and fauna. The Wildlife Atlas and Flora Information System now hold 2.7 million and about 1.5 million records respectively and are being continually expanded. These databases can be used to provide a wealth of information and also assist in defining the populations of threatened species that require habitat protection.

At the broad ecosystem level, 28 Broad Vegetation Types (BVTs) are recognised in Victoria (mapped in Victoria's Biodiversity). At a more detailed and useful level vegetation is being mapped at a much finer scale, referred to as Ecological Vegetation Classes (EVCs), of which there are about 200 recognised in Victoria. This finer resolution, and estimate of their pre-European extent, allows clearer definition of what vegetation types have been depleted or declined, and which may now be threatened. Such data also assists in targeting conservation efforts, for example, selecting which areas are needed to make our reserve and protected area system 'Comprehensive, Adequate and Representative' (CAR). Over 80% of the State is now mapped for EVCs and the whole state will be completed in the forthcoming years.

Land use

Land is a vital element of the environment. It provides the base for food production, homes, industrial and commercial developments, and a range of other social and recreational activities. Land-use practices are important in maintaining and improving the quality of the environment whilst also meeting the economic and social needs of the community. Deforestation and agricultural practices can have a significant impact on the environment, contributing to soil salinity, erosion, and turbidity (cloudiness) in our waterways.

The clearing of native vegetation, whether for agriculture or forestry, is a significant environmental issue because the loss of trees can lead to declines in the abundance of wildlife, and increased levels of land degradation. The growth of agriculture has been a key reason for tree clearing. In 1788, Victoria was estimated to have 18.5 million hectares of forest, by 1997, there were just 7.3 million hectares. This amounts to a 60.6% reduction in just over 200 years.

Agricultural land is generally divided into cropped land, land sown to pastures and grasses, and a broad balance comprising grazing land and land lying idle or under fallow. In 2000, a total of 13.3 million hectares was devoted to agriculture in Victoria, a slight increase (3.6%) on the 1999 figure (table 12.11). This represented 58.3% of Victoria's land mass, yet Victoria contributes just 2.9% of all Australia's agricultural land.

12.11   LAND MANAGEMENT(a)

	1998	1999	2000
	'000 ha	'000 ha	'000 ha
Agricultural land(b)			
Crops(c)	2 565	2 749	3 081
Sown pastures and grasses	4 639	4 739	4 702
Other(d)	5 487	5 302	5 468
Total	12 691	12 790	13 251
Non-agricultural land(e)	10 051	9 952	9 491

(a) 1998 and 1999, year ended 31 March; 2000, year ended 30 June. (b)Total area of establishments with an EVAO of $5,000 or more. (c) Excludes crops harvested for hay and seed. (d) Grazing land, land lying idle or under fallow. (e) Comprises conserved land, forestry, urban, unused land, and establishments not included in the Agricultural Census/Commodity Survey.

Source: Agriculture, Australia (Cat. no. 7113.0).

Irrigated pasture land use occurs mainly in the north of the State in the Torrumbarry, Campaspe and Shepparton irrigation areas. Horticulture (fruit and vegetable growing) occurs in a number of localised areas across the state that have suitable climate, soils and access to irrigation water.

Approximately 34.0% of Victoria is public (or Crown) land, with the remainder being privately owned. Of the public land, 46.0% is protected under the parks system, which represents approximately 16.0% of the total area of the State. There are currently six major types of parks and reserves that comprise Victoria's Parks System (table 12.12). Major parks include the Sunset Country and Big Desert Parks in the northwest of the state and the Alpine National Park in the east of the State.

12.12   TYPES OF PARKS COMPRISING THE SYSTEM

	Total area of the parks system	Total area of the parks system
	'000 ha	%
National Park	2 575.6	70.8
Wilderness Park	202.1	5.5
State Park	183.6	5.0
Other Park	112.4	3.0
Metropolitan Park	8.3	0.2
Reserve	562.9	15.4
Total	**3 644.9**	**100**

Source: Parks Victoria, 'State of the Parks 2000.

Forestry plantations are a significant land use in localised areas in the southwest, northeast and in the Strzelecki Ranges. Conservation and wood production are just two of a variety of purposes for which forests are managed. The amount of forests in conservation reserves varies greatly between State and Territories. As at 1997, the area of forests in conservation reserves in Victoria was 37.2% of the total forest estate, which compares with the national average of 11.3%.

Forests

Forests are an important sustainable natural resource, providing a wide range of essential products and benefits to the community. Farm forestry is becoming increasingly important as a commercial source of timber, with a broad range of programs operated by government and private agencies to promote landcare and reafforestation on Australian farms. At September 2000, there were 318,633 hectares of plantation in Victoria. Of this, industrial plantations (which include mixed hardwood and softwood species) comprise 297,547 hectares, and farm forestry (which include predominantly group plantings of mixed hardwood species) comprise 21,086 hectares. Hardwood plantations represent 101,453 hectares of the total plantations and softwood plantations represent 215,111 hectares.

Salinity

One of the greatest challenges in land management is the problem of salinity. Salinity is a measure of the amount of salt in surface soil or groundwater and is related to the loss of trees as well as the increasing use of irrigation for crops and pastures. This gives rise to two types of salinity: irrigation salinity and dryland salinity. Both types occur when water tables rise, bringing salts normally stored well below ground to near the soil surface. Irrigation salinity occurs when water is applied in greater amounts than is used by crops. The excess water feeds into the water table and may cause it to rise. Dryland salinity occurs outside of irrigated areas, and although it can occur naturally, it is also caused when trees and other deep rooted native vegetation are removed and replaced with annual shallow rooted agricultural crops. The shallow rooted crops do not use as much rainwater as native vegetation which results in more water reaching the water table, causing it to creep nearer to the soil surface. As the water rises it carries dissolved salts with it. This saline soil and the water prevent some plants growing while killing others.

Potential impacts of shallow watertables and dryland salinity on physical infrastructure, particularly roads and rail, are predicted to more than double by 2,050 (table 12.13). These changes, particularly for the road network, would be expected to greatly increase the maintenance costs incurred by State and Local Governments.

12.13   ASSETS AT HIGH RISK FROM SALINITY(a)

	Unit	2001	2020	2050
Agricultural Land	ha	555 000	1 170 000	2 800 000
Perennial Vegetation	ha	6 200	11 830	24 280
Railways	km	131	303	952
Freeways and major roads	km	808	1 541	3 597
Other roads	km	3 088	6 513	17 326
Length of stream or perimeter of wetlands	km	10 121	18 146	34 599
Towns	no.	10	21	63
Ramsar wetlands(b)	no.	4	5	8

(a) Assets at high risk from salinity from shallow groundwater and under the worst case scenario in Victoria (b) Coastal wetlands have not been included in those at risk.

Source: Compiled by Victorian Department of Natural Resources and Environment for the 'Australian Dryland Salinity Assessment 2000' (National Heritage Trust).

Environment protection activity

Government

Local government plays an important part in managing Victoria's environment and natural resources. Expenditure and revenue related to environment protection and natural resource management activities is one way of measuring the level of activity carried out by various governments.

Environment protection expenditures and revenues cover activities that prevent, reduce or eliminate pressures on the environment arising from social and economic activities, as well as activities aimed at repairing or restoring damage after it has occurred. The dominant environmental protection activities undertaken by local government in Victoria in 1999–2000 were those related to solid waste management, representing 73.9% of current environmental protection expenses and 91.2% of revenue (table 12.14). Solid waste management refers to landfill and solid operations by local government and the implementation of programs to reduce the amount of materials entering the solid waste stream. Waste water management expenditure and revenue by local government represent only a fraction of that for solid waste management as other agencies are responsible for sewage infrastructure, treatment and water protection.

Natural resource management activities include the management of natural assets (trees, land, water, minerals, biodiversity) and activities aimed at making more efficient use of these resources, as well as activities associated with the recreational use of the environment, such as management of parks, beaches and reserves. The majority of natural resource management revenue came from land management and development activities (81.4%) in 1999–2000 (table 12.14). The largest expenditure also occurred on land management and development activities which accounted for 95.6% of all current expenses and 96.8% of all capital expenses. Land management and development activities include zoning of land, management of recreational parks and sporting fields, management of crown land not reserved for native biodiversity and processing of development applications and associated costs.

12.14   ENVIRONMENTAL EXPENDITURE AND REVENUE BY LOCAL GOVERNMENT, 1999–2000

	Revenue		Current expenses		Capital expenditure	
	Total	Per capita	Total	Per capita	Total	Per capita
	$m	$	$m	$	$m	$
Environment protection category						
Waste water management	4.4	1	40.0	8	19.2	4
Solid waste management	192.3	40	216.2	45	17.7	4
Protection of biodiversity & landscape	2.9	1	13.3	3	3.1	1
Protection of soil & groundwater	**0.1	—	1.7	—	**0.5	—
Cultural heritage	7.4	2	18.2	4	9.3	2
Other(a)	*3.9	1	*2.9	1	*0.1	—
Total(c)	210.9	45	292.4	61	49.9	11
Natural resource management category						
Inland water use & management	*0.2	—	0.5	—	*0.2	—
Land management & development	29.8	6	158.1	33	43.0	9
Other(b)	*6.6	1	6.8	1	**1.2	—
Total(c)	36.6	8	165.4	35	44.4	9

(a) Includes any environmental protection activity not broken down in the above categories, ambient air and climate protection, noise and vibration control, education on environmental protection and measures to protect the environment from radiation. (b) Includes the quarrying to provide raw materials for council works, activities or programs aimed at developing alternative energy resources and measures to reduce energy consumption. (c) Where figures have been rounded, discrepancies may occur within totals.

Source: Environmental Expenditure, Local Government, Australia (Cat. no. 4611.0).

Households and the environment

Households can reduce their impact on the environment through actions such as using environmentally friendly products and recycling, by reducing water, energy and vehicle use and by reducing the amount of waste produced.

Almost half of the households in Victoria in 2001 used refillable containers and recycled paper (table 12.15). Overall, the least used environmentally friendly product was organically grown fruit and vegetables. For those households who only sometimes used environmentally friendly products, the main products used were organically grown fruit and vegetables and recycled paper. Approximately one-fifth of Victorian households were not sure whether the cleaning products they used were phosphate-free.

**12.15   HOUSEHOLD USE OF ENVIRONMENTALLY FRIENDLY PRODUCTS —
March 2001(a)**

	Yes	Sometimes/ depends	No	Don't know
	%	%	%	%
Unbleached paper	33.4	18.4	44.3	3.9
Recycled paper	47.0	22.4	27.5	3.1
Phosphate-free cleaning products	27.0	11.6	42.2	19.1
Refillable containers	47.6	14.5	35.8	2.1
Organically grown fruit & vegetables	20.1	25.1	52.1	2.7

(a) Proportions are of all households.

Source: Environmental Issues: People's Views and Practices (Cat. no. 4602.0).

The principle reason given by households for not using environmentally friendly products in 2001 was because they were considered more expensive (38.2%) (table 12.16). Since 1992, there has been a significant decline in households citing inferior quality (23.7% in 1992 compared to 17.1% in 2001) and always buying the same brand (27.9% in 1992 compared to 16.3% in 2001) as reasons for not using environmentally friendly products.

**12.16   HOUSEHOLDS NOT USING PRODUCTS, Reasons Products Are Not
Used(a)**

	May 1992	March 1998	March 2001
	%	%	%
More expensive	22.4	35.4	38.2
Always buy the same brand	27.9	14.3	16.3
Inferior quality	23.7	16.8	17.1
Not convinced about environment claims	6.4	4.1	4.6
Not interested/too much effort	17.7	15.7	16.1
Grows own fruit and vegetables	n.c.	8.3	5.9
Not readily available	n.c.	17.0	16.0
Other	16.0	11.1	14.7
No reason	n.c.	17.1	13.1

(a) Proportions are of all households.

Source: Environmental Issues: People's Views and Practices (Cat. no. 4602.0).

Water Sources, Uses and Issues

Over nine in ten Victorian households received their domestic water supply from mains or town water (table 12.17). The next most important sources of water were bottled water (14.2%) and rainwater tanks (13.5%). Victorian households, along with most other State/Territory households, have showed an increasing trend in the consumption of bottled water (graph 12.18).

12.17   WATER SOURCES AND USE BY HOUSEHOLDS(a)

	Mains/ town	Rainwater/ tank	Bottled	Spring	Bore/ well	River/ creek/ dam	Recycled/ grey water	Other
Main Sources of Garden Water	90.8	2.6	n.c.	*0.1	1.6	4.3	*0.4	*0.2
Main Sources of Bath,Shower & Washing Water	92.5	6.5	n.c.	—	*0.2	0.7	n.c.	*0.1
Main Sources of Drinking Water	83.7	10.5	5.4	—	*0.1	*0.1	n.c.	*0.2
Total Sources of Water	93.0	13.5	14.2	*0.2	2.0	5.0	n.c.	*0.7

(a) Proportions are of all households.

Source: Environmental Issues: People's Views and Practices (Cat. no. 4602.0).

12.18   CONSUMPTION OF BOTTLED WATER(a) 1994–2001
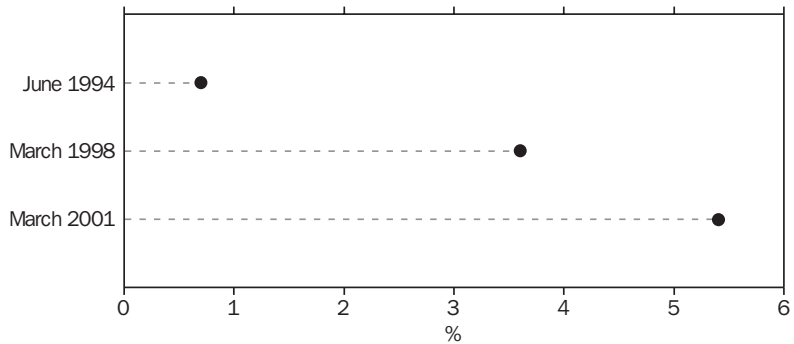
Note: (a) Proportions are of all adults aged 18 years and over.

Source: Environmental Issues: People's Views and Practices (Cat. no. 4602).

The principle reason given by Victorians for dissatisfaction with the quality of mains water is taste (table 12.19), which is consistent with the majority of households in other States and Territories. In both 1998 and 2001, Victorians were the most likely to cite odour of the mains water as a reason for dissatisfaction, and in 2001, also the most likely to be dissatisfied with the colour of mains water.

12.19   PERSONS DISSATISFIED WITH THE QUALITY OF MAINS WATER(a)

	March 1998	March 2001
	%	%
Salty	n.c.	*0.3
Taste	58.0	n.a.
Other Taste	n.a.	45.4
Colour	18.0	18.6
Chlorine	29.5	36.2
Dirty	18.5	19.8
Odour	21.0	18.3
Microbial/algae contamination	n.c.	8.8
Other	14.4	12.7

(a) Proportions are of all households.

Source: Environmental Issues: People's Views and Practices (Cat. no. 4602.0).

Victorian households are more likely to practice water conservation water in the home, compared to other States and Territories. Those households not adopting any steps to conserve water at home have decreased over the past three years in Victoria (53.5% in 1998 compared to 48.7% in 2001), substantially less than the national figure of 56.0% in 2001. The use of a dual flush toilet is the principle method used by households to conserve water, with the majority of households citing this method in both 1998 and 2001 (table 12.20). Other main conservation methods continue to be the use of a reduced flow shower head, and using full loads when washing. The proportion of Victorian households conserving water by taking shorter showers also increased significantly since 1998 (up by 5 percentage points).

12.20   HOUSEHOLD WATER CONSERVATION METHODS(a)

	March 1998	March 2001
	%	%
Dual Flush Toilet	64.2	71.2
Reduced flow shower head	31.7	31.7
Neither item	27.6	22.6
Recycle/reuse water	13.8	14.1
Full loads when washing	20.4	22.1
Shorter showers	14.5	19.3
Turn off/repair dripping taps	19.8	21.8
Brick in toilet cistern	1.5	1.3
Use bucket to wash car	5.7	5.7
Wash car on lawn	6.2	6.9
Use less water in baths/troughs/basins	n.c.	7.3
Use broom to clean paths	4.9	5.6
Other	7.4	7.5
No conservation steps	53.5	48.7

(a) Proportions are of all households. Excludes conservation methods in the garden.

Source: Environmental Issues: People's Views and Practices (Cat. no. 4602.0).

Waste management

The generation and disposal of waste is an environmental issue of increasing importance. Some wastes can impact directly on human health if not dealt with appropriately, while all waste must be managed carefully to minimise environmental and aesthetic impacts. In Victoria, a strong emphasis is placed on avoiding the generation of, and promoting the recycling of, wastes. Local government is responsible for provision of domestic waste management services such as garbage collection and also provides local recycling programs. Programs sponsored by the EPA, EcoRecycle Victoria, Business Victoria and Energy Efficiency Victoria are aimed at demonstrating the environmental and economic benefits of waste avoidance and recycling to industry.

Recycling

For the 2000–01 financial year almost 4 million tonnes of material were recovered and diverted from landfill, which were either reprocessed in Victoria or exported for recycling (table 12.21).

The largest amount of weight (tonnes) of material processed was from the construction and demolition sector (33.1% of total material recovered). This sector consists of the heaviest material and exists in large quantities in the waste stream. Metals, paper and organics also diverted significant amounts of material from Victorian landfill. Metals, paper (already established in kerbside collections) and organics are also being collected at kerbside at increasing frequencies.

Those materials with a smaller share of the total waste materials covered included glass and plastic, and textiles and rubber, for which collection and recycling systems are still maturing.

The 2000–01 period continues the steady growth in the quantity of material being recycled in Victoria. Relative to the previous financial year there has been a 20.0% increase in material recovered for recycling.

12.21 MATERIALS RECOVERED FOR RECYCLING–VICTORIA 2000–01(a)

	Exported/ Unprocessed	Reprocessed Locally	Total Recovery
	tonnes	tonnes	tonnes
Metals	158 308	737 736	896 044
Construction and Demolition	—	1 318 259	1 318 259
Paper	96 802	613 821	710 623
Organics	437	667 392	667 829
Glass	161	125 125	125 286
Plastic	18 003	64 940	82 943
Rubber	1 012	24 840	25 852
Textiles	6 929	70 080	77 009
Other	6 300	75 746	82 046
Total All Materials	**287 952**	**3 697 939**	**3 985 891**

(a) Refer to EcoRecycle Victoria for the full list of items.

Source: EcoRecycle Victoria, 'Annual Survey of Victorian Recycling Industries 2000–01'.

The majority of solid waste is disposed at landfill sites. Solid waste is generally classified by household (municipal), commercial, industrial, building, demolition and hazardous wastes. The Landfill Levy was introduced in 1992 under the Environment Protection Act. Collection of the levy provides information about the amount of waste disposed of at landfills. The total waste disposed to landfill in Victoria in 2000–01 was 4.9m tonnes, a slight increase on the amount disposed in 1999–2000 (table 12.22).

12.22 SOLID WASTE DISPOSED OF AT LANDFILL

	Total	Total
	Tonnes	Kg per capita
1996–97	3 487 000	761
1997–98	4 434 000	958
1998–99	4 185 000	893
1999–2000	4 825 040	1 018
2000–01	4 906 730	1 023

Note: Tonnage for 1999–2000 and 2000–01 include both normal waste and prescribed industrial waste.

Source: Environment Protection Authority.

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