

5 Land

5.1 Main findings



Land – and the social, economic and ecological values it provides – is fundamental to the identity and purpose of the Australian Capital Territory (ACT).

The key pressures on land in the ACT are changes to land use, particularly greenfield development, which places greater pressure on the land and the environment due to the likelihood of vegetation clearance and other permanent changes to the development area.

The total area of the ACT is 235 824 hectares (ha), including:

- 17 042 ha zoned for urban and intensive uses, such as residential, industrial and commercial uses
- 32 789 ha zoned for rural purposes, such as agriculture, grazing and plantation forestry
- 170 076 ha classified as conservation and natural environments, such as nature conservation areas, protected areas and minimal use areas.

In 2011–2015, approximately 816 ha of land was added to the reserve network. This includes 621 ha as part of the Gungahlin Strategic Assessment and 195 ha of other land allocated during the reporting period in relation to other land-release areas as environmental offsets.

The number of development applications lodged with the ACT Government during 2011–2015 has remained relatively stable compared with the numbers reported in 2007–2011. However, legislative change in 2008 meant that many buildings and smaller forms of construction after that time only required building approvals rather than development applications. A direct comparison between the two reporting periods is therefore difficult. Although the percentage of greenfield development is higher than infill for this reporting period, it is significantly lower than in the previous reporting period. Projections show that this trend is likely to continue.

Resilience to pressure on our land resources will require careful management to balance the needs of urban development with environmental protection. The *ACT Planning Strategy (2012)* was released early in the reporting period, and aims to address the challenges for the ACT in the face of continued growth of the city, while maintaining important environmental values. It recognises the need to use land more efficiently, and reduce the amount of land used and waste produced. It also highlights the need to improve Canberra's resilience to change and its environmental sustainability through design measures that include the creation of wildlife and vegetation links to improve ecosystem services.



Soil is also a fundamental part of ecosystems and natural processes, providing a basic resource for plant growth. Soil condition directly affects environmental outcomes and knowledge of soil condition informs assessments of land capability and appropriate land use. Soil also has a role in water quality and water yield.

Pressures that can affect soil in the ACT include fire, floods, high-intensity storms, land clearing, agriculture, urban and industrial development, and recreation activities. This suggests that it is particularly important for all land managers in the ACT to pay attention to management

decisions that affect soil. Baseline data for soil condition in the ACT are not currently available. However, soil mapping work is currently being conducted, and it is likely that it will be possible to report against this indicator in the next State of the Environment Report.

5.2 Introduction

This chapter reports against indicators that measure the state of land use and soil condition, and examines the existing and future pressures on Australian Capital Territory (ACT) land.

This chapter will:

- define land
- explain why land is important
- explain how land is measured in the ACT
- describe the current state of land in the ACT
- assess whether land values in the ACT are stable, improving or declining
- describe the pressures on the ACT's land and the impacts these pressures are having
- assess whether these impacts are stable, increasing or decreasing
- summarise government land management responses.

5.2.1 What is land?

Land can be described and classified in many ways, depending on whether the focus is on the underlying geology, landforms, soils, ecological communities, sociocultural boundaries, associated industries or other features.

In the context of this State of the Environment Report, land is categorised in relation to its:

- physical composition (ie geomorphology and, specifically, soil)
- jurisdictional boundaries and uses
- effect upon the other themes – air, water, heritage and biodiversity – that are assessed in this report.



I need not emphasise to you the seriousness of the problem and the desirability of our taking effective action ... to conserve the soil as our basic asset. The nation that destroys its soil destroys itself.

-Franklin D Roosevelt

Soil is a fundamental part of ecosystems and natural processes. Soil provides a growing medium for plants, which people and livestock rely on. In urban environments, soil provides the medium for ornamental gardens, urban food production and green spaces that support a range of amenity values.^{1,2} This living infrastructure adds to the livability of our urban areas, and is conducive to physical activity and mental wellbeing (see Chapter 9). Indirectly, humans benefit from the many roles of soil, which include buffering and moderating the movement of water through ecosystems; disposing of wastes and dead organic matter; renewing fertility; regulating major element cycles such as carbon, nitrogen and sulfur; and ameliorating urban heat effects.^{1,3,4}

Land – and the social, economic and ecological values it provides – is fundamental to the identity and purpose of the ACT. Land use and land-use change, and soil condition are important topics to explore when examining how land contributes to human wellbeing through the delivery of ecosystem services, and also how human activities affect these. A resilience approach can help to secure the benefits that land provides, despite ongoing pressures from a range of sources, including climate change, vegetation clearing and urban expansion.

The Community case study 5.1 on page 131 highlights the importance of public green space and gardens.

5.2.2 Why is land important?

Human wellbeing is dependent on land. The interactions of soil, air, water, plants, animals and natural processes provide a diverse range of services, including food and clean water production, nutrient recycling, erosion control and recreation opportunities. How land is used and managed can significantly affect its capacity to provide these services, which in turn can have direct and indirect impacts on human wellbeing.



Erosion from a building site at Molonglo

Photo: TAMS, ACT Government



Community case study 5.1

Community gardens in the ACT

Community gardens in the Australian Capital Territory (ACT) are mostly located on public land, and give members a place to grow their own fruit and vegetables, and exchange gardening ideas and experiences. Organic methods – which can help improve soils – are encouraged and supported. Social benefits include increased access to fresh food, community learning, and a sense of belonging and pride in the community.^a These gardens also offer productive ways to use land that would be otherwise at risk of weed invasion, erosion and other degradation. The added vegetation also creates habitat values in the urban environment.

A review of community gardens undertaken in 2012, by what is now the Environment and Planning Directorate, reported a growing demand for community gardens in the ACT.^b It also highlighted positive social, cultural, health, economic and educational outcomes for participants – and the community more broadly – in addition to environmental and ecological benefits.

The review identified that at least 77 food-producing school gardening sites existed in the ACT, in addition to 17 community gardens. The latter mainly comprised fenced, individual plots, and organic or low-chemical cultivation methods. The variety of designs, intentions and governance/management arrangements in place indicated that there is no single ‘right’ model for a community garden.

The study found that effective cross-sectoral partnerships and access to information are integral to the success of these enterprises. Succession planning for managers/volunteers and having community gardens within walking

distance of people’s place of residence were also identified as key issues for success. In 2015–16, the Environment and Planning Directorate made \$25 000 available for individual small grants of up to \$5000 for new or existing community gardens aimed at achieving a range of social outcomes.^c Ongoing funding is yet to be confirmed.

The Canberra Organic Growers Society (COGS),^d a not-for-profit organisation that encourages and supports organic gardening methods, is licensed by the ACT Government to operate 12 community gardens on government land in the ACT. The COGS garden at Holder has been in operation since 2001, and has a very active gardening community and about 57 plots of varying sizes. Casuarinas were planted to provide wind protection and shade for a communal orchard, herb garden, grapevines, raspberries and a vegetable patch. The garden also has a greenhouse, shed, barbecue, compost heaps and tools. Gardeners share the allotment with a range of passing native and non-native wildlife.^e

A group of Lyneham residents has started a slightly different venture in urban food production. Working with Territory and Municipal Services, they are setting up a shared food forest.^f The site is on a small piece of low-use public land behind the Lyneham Primary School, adjacent to Sullivans Creek stormwater drain and a short walk from the Lyneham shops. The first stage of works for the food forest, known as Lyneham Commons, will involve soil preparation and planting a variety of fruit trees. Approximately 30 fruit and nut trees and complementary plants, selected for resistance to pests and disease and to suit local conditions, will be planted during the next couple of years.

Sources:

a www.ecoaction.com.au/resources/community/edible-plants

b www.planning.act.gov.au/tools_resources/research-based-planning/demand_for_community_gardens_and_their_benefits

c www.environment.act.gov.au/cpr/grants/act_environment_grants

d www.cogs.asn.au/community-gardense

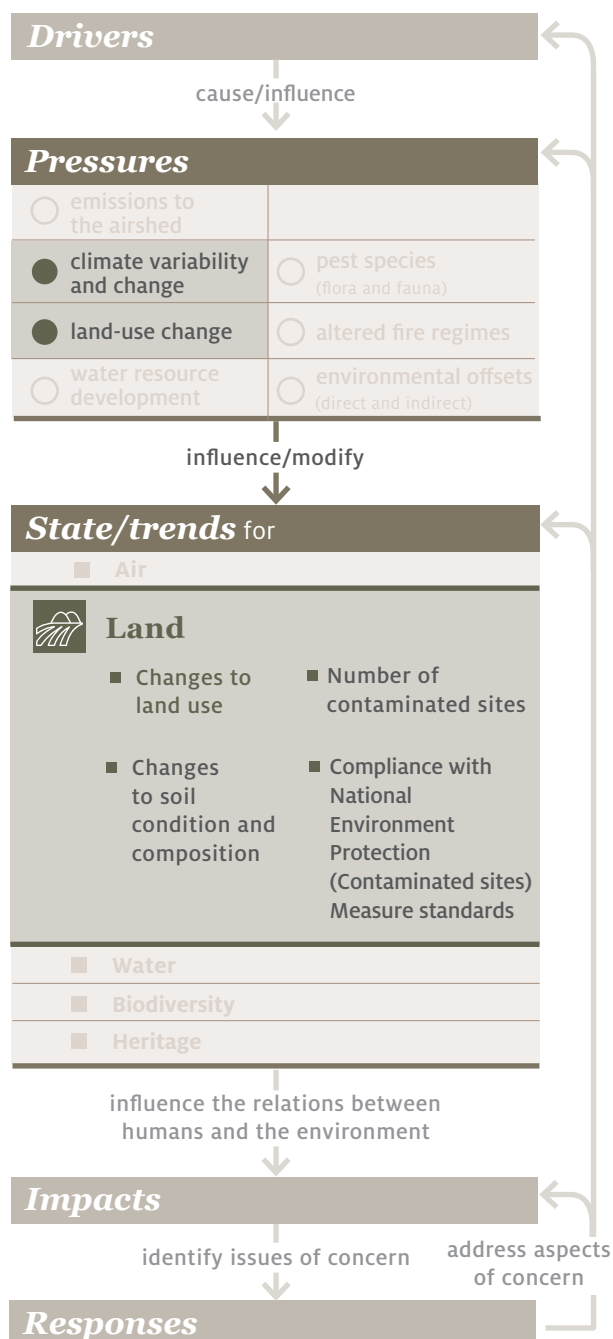
e www.cogs.asn.au/community-gardens/holder-garden

f <http://timetotalk.act.gov.au/consultations/?engagement=lyneham-food-forest>



Links and influences

The *Driver–Pressure–State–Impact–Response* model as used in the ACT State of the Environment Report



5.2.3 How do we measure land condition?

An established set of indicators is used to measure land condition:

- state and trend
 - land use
 - soil condition (soil type and soil properties)
 - contaminated sites
 - compliance with the National Environment Protection (Assessment of Site Contamination) Measure (Assessment of Site Contamination NEPM)
- impacts and pressures
 - land-use change (number and type of development applications, and greenfield versus infill development).



View of the Molonglo development front from Mount Stromlo

Photo: Office of the Commissioner for Sustainability and the Environment



5.3 Indicators

5.3.1 State and trend

Land use

Why is this indicator important?

The ACT community uses land in many different ways. More than half of the ACT is managed for conservation purposes, with the remainder made up of urban areas, agricultural land, forests grown for commercial timber, roads, rivers and water bodies.⁵

Different land uses are a major reason for differences in environmental condition. Land uses have varying effects on the ecological functions, attributes and integrity of land.

Current monitoring status and interpretation issues

This indicator looks at the extent of ACT land used for:

- rural uses, including agriculture, grazing and plantation forestry
- urban and intensive use
- conservation and other protected areas.

Land use is different to land tenure, although tenure can significantly affect land management practices and, correspondingly, land use.

The Territory Plan 2008, under the *Planning and Development Act 2007*, sets out zoning that identifies the types of land use and activities that may occur in an area. A single block of land may have more than one land use permitted; however, different land-use zones may not overlap. The Territory Plan also includes overlay zones, which represent a specific restriction and designate an area in which a particular activity or purpose is permitted.⁶

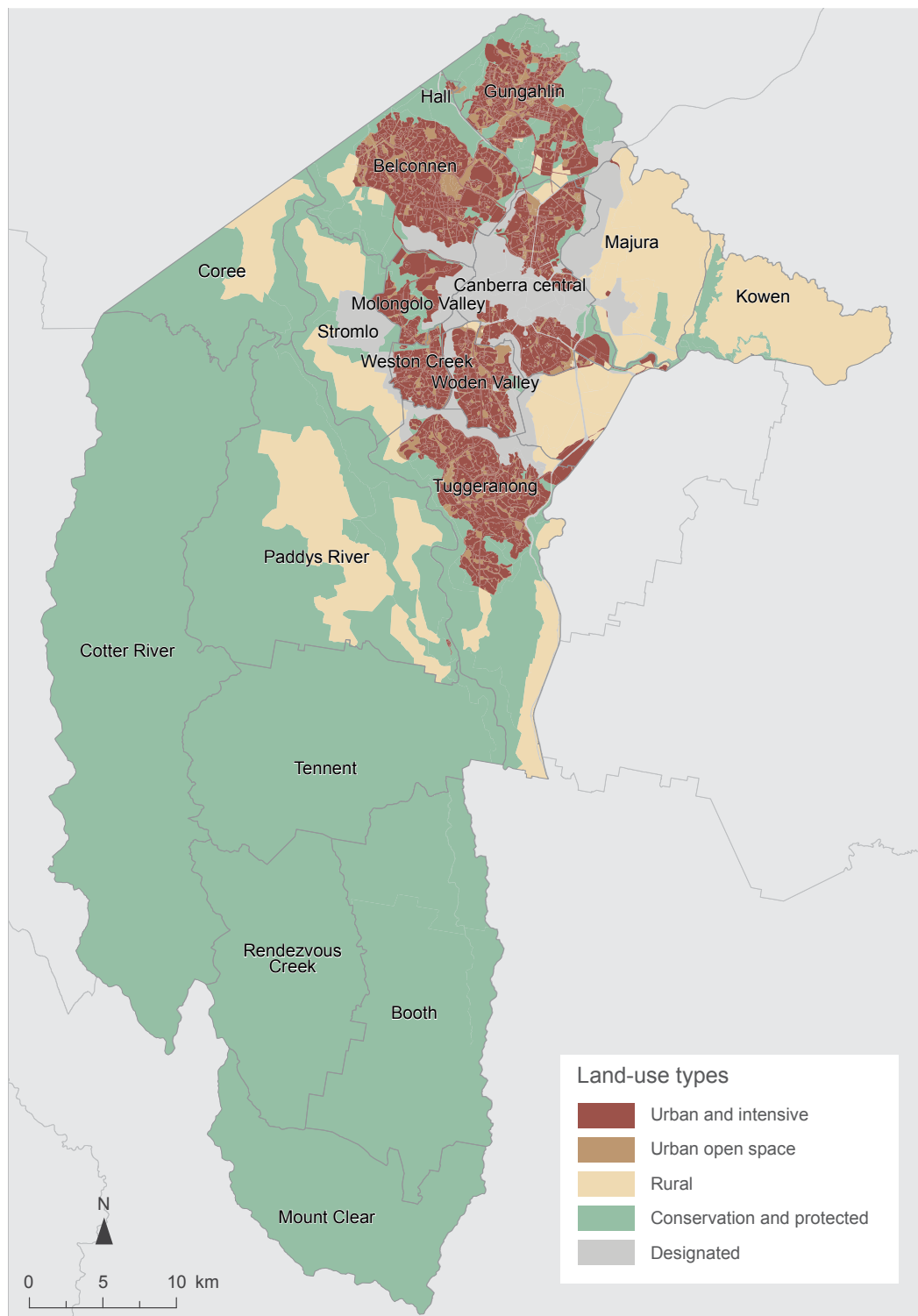
Data presented in accordance with the Territory Plan in Figure 5.1 are based on land zoning and may not reflect the actual current land use. For example, the areas shown as conservation and other protected areas are based on Territory Plan zones – hills, ridges and buffers; mountains and bushland; and river corridors. The zoning objectives of these areas are generally to protect ecological, cultural and heritage resources, and environmental integrity. However, some areas within these zones are private land under the tenure of rural lease holders. These areas do not appear as conservation and protected areas in Table 5.1 because they are not managed for this purpose by the ACT Government.

Data presented for the land-use category of ‘conservation and other protected areas’ differ from the category used in Chapter 7: Biodiversity. This chapter bases ‘conservation and other protected areas’ on the definition used in the Collaborative Australian Protected Areas Database and includes only land reserved for specific conservation purposes.

The land-use indicator should be interpreted in the context of its relationship to land-use changes and trends over time. Land-use change is assessed as a pressure indicator in this chapter.

What does this indicator tell us?

The total area of the ACT is 235 824 hectares (ha); however, the area of land under the tenure of the ACT Government is 224 662 ha. The remainder of land, shown as ‘designated’ in Figure 5.1, is Commonwealth land. This largely includes urban areas, particularly around central Canberra, and Lake Burley Griffin.



Source: Environment and Planning Directorate

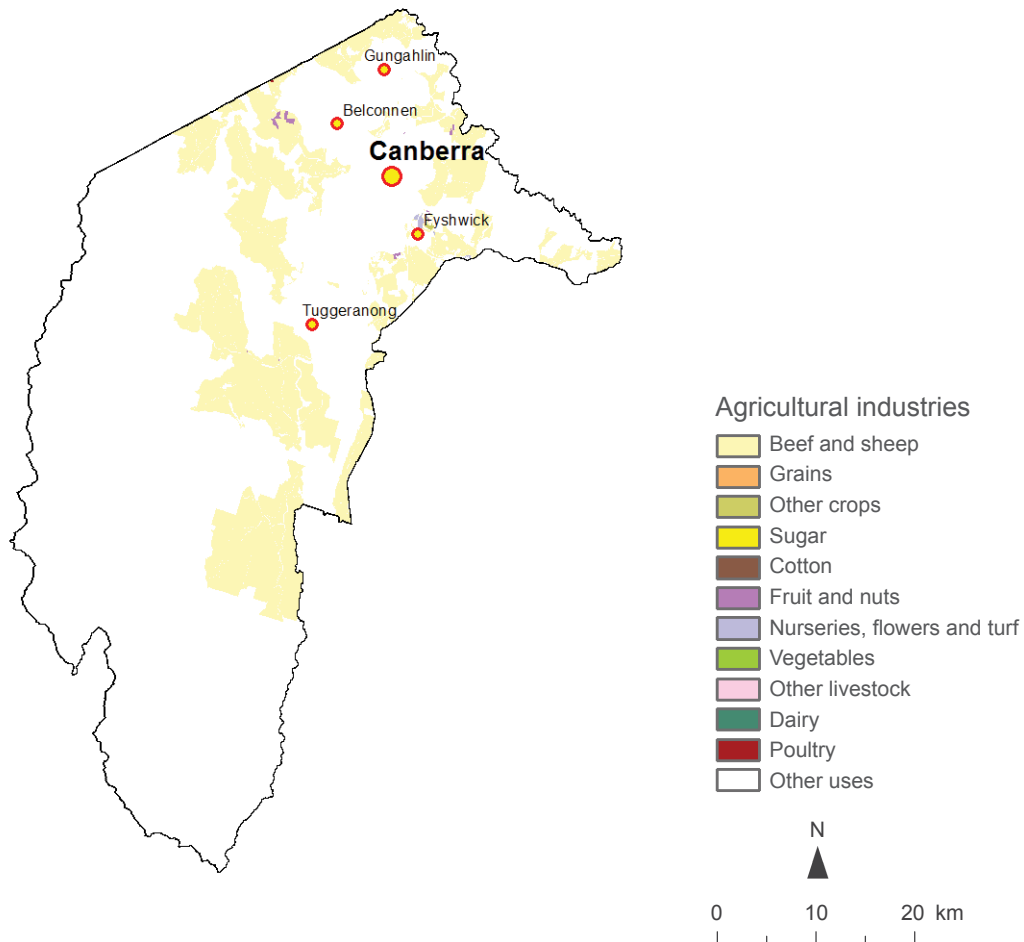
Figure 5.1 Types of land use in the ACT, 2015



Rural uses, including agriculture, grazing and plantation forestry

According to Territory Plan zoning, 32 789 ha of the ACT is zoned for rural purposes. This includes land used for agriculture, grazing, plantation forestry and

other rural uses (Figure 5.2). This is a slight decrease in the amount of land zoned for rural uses since the previous reporting period.



Source: Australian Bureau of Agricultural and Resource Economics and Sciences⁷

Figure 5.2 ACT agricultural industries

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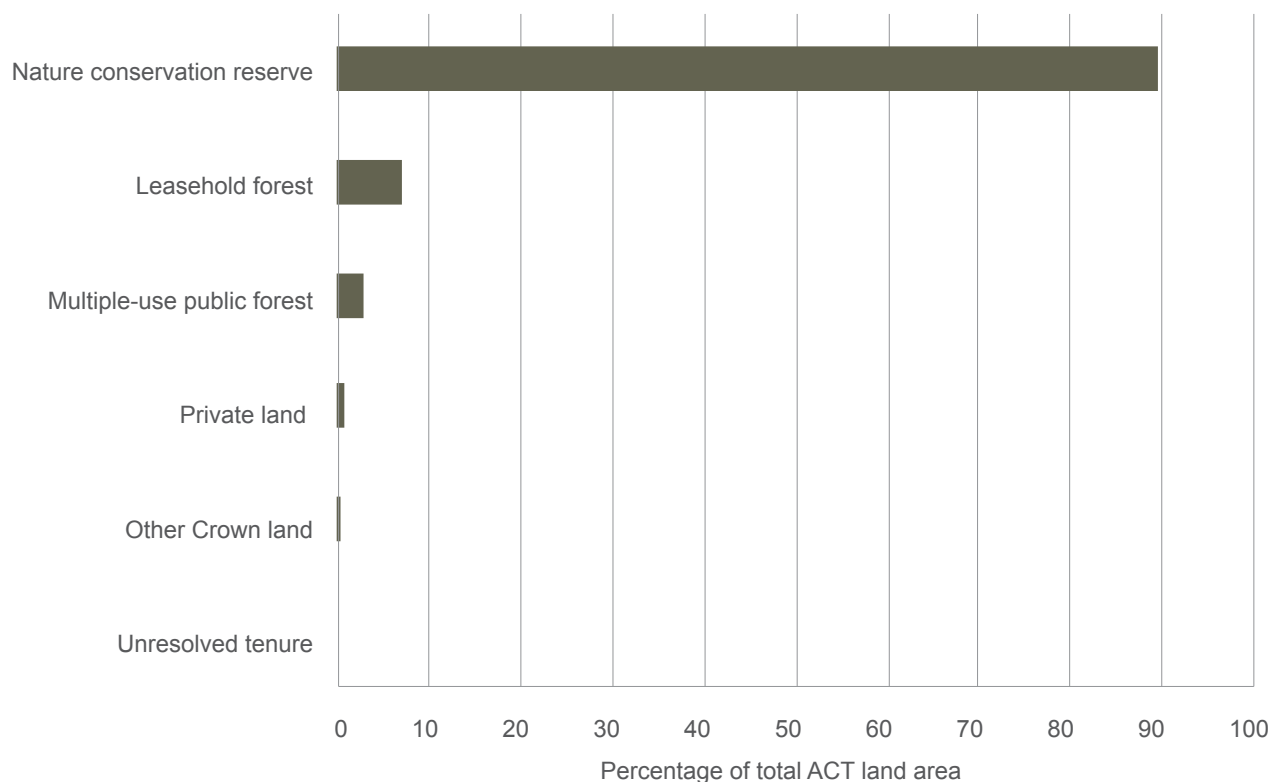
The ACT has a relatively small agricultural sector. Beef cattle farms are the most common, accounting for 40% of all farms; they are also the most profitable type of farming.⁷

Along with land used for agriculture and grazing, pine plantations owned by the ACT Government also make up rural land in the ACT. In the 2003 bushfires, a large amount of the pine plantation estate was destroyed. The Kowen Forest plantation was the only one that remained undamaged. Some burnt plantation areas were replanted with pine trees, particularly where soil stabilisation and water quality protection were a priority, and boundaries were redefined, with some areas converted to native vegetation.

Territory and Municipal Services (TAMS) now manages all former ACT forest land. Timber harvesting only

occurs in Kowen Forest, which is approximately 5500 ha in area. The pine forests are also extensively used and managed for recreational activities, including walking, jogging, horse riding and cycling. The number of visitors to the plantation estate now equals the number of visitors to the ACT national parks reserve system due to the plantation's close proximity to Canberra, the substantial high-quality road and trail infrastructure, and the investment made in forest management.⁸

Although the majority of native forests within the ACT are located within conservation reserves, according to the Bureau of Agricultural and Resource Economics and Sciences, approximately 10% are located on multiple-use public land, private land and leasehold land (Figure 5.3).⁷



Source: Australian Bureau of Agricultural and Resource Economics and Sciences,⁷ p 6

Figure 5.3 Area of native forest in the ACT as a percentage of total ACT land area, by tenure, 2015



Urban and intensive uses

The Territory Plan 2008 refers to residential zones, industrial zones, commercial zones, areas zoned for community facilities, and transport and services zones; this report defines these areas as urban and intensive use areas. According to this definition, 17 042 ha within the ACT is used for urban and intensive uses. This is a decrease of approximately 600 ha in areas zoned for these purposes from the 2011 report.

Greenfield development is the most important type of development in the ACT in terms of the pressures it places and the effects it has on land condition and the broader environment (see Section 5.3.2).

In 2011–2015, the total area of greenfield development in the ACT was approximately 1420 ha.^a This includes development at Bonner, Ngunnawal 2C, Jacka 1, Coombs, Wright, Denman Prospect 1A, Moncrieff, Throsby, Harrison 4, Franklin, Crace, Forde 2, West Macgregor–Belconnen, Lawson and Flemington Road. Blocks for development at some of these suburbs are released in stages over a period of time. In these cases, some of the land counted within the 1420 ha may have been released outside this reporting period.

Urban open space and recreation areas such as parks and ovals also lie within the urban footprint. The total area zoned for urban open space and recreation is 4794 ha. Approximately 327 ha of additional urban open space was created during the reporting period in new development areas.^b

Conservation and other protected areas

Areas classified as conservation and natural environments in this chapter include nature conservation areas, such as national parks and nature reserves, and other protected areas, such as minimal-use areas (eg water supply catchments). Areas zoned for these purposes in the Territory Plan occupy approximately 72% of the ACT (Figure 5.1); however, not all areas within these zones are managed by TAMS for conservation or protection, as shown in Table 5.1. (This differs from the definition of a protected area in Chapter 7: Biodiversity, which excludes water supply catchments and other areas not managed for nature conservation.)

In 2011–2015, approximately 816 ha of land was added to the reserve network. This includes 621 ha as part of the Gungahlin Strategic Assessment, and 195 ha of other land allocated in relation to other land-release areas as environmental offsets.^c

The Planning and Development Act sets out management objectives for each of the types of public land, including national parks, nature reserves and other protected areas. Table 5.1 outlines the management objectives for conservation and protected areas as defined in the Planning and Development Act, and includes the area of each according to TAMS.

^a Data provided by the ACT Land Development Agency, December 2014

^b Data provided by the ACT Land Development Agency, December 2014

^c Data provided by the ACT Land Development Agency, December 2014

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**Table 5.1 Conservation and other protected areas by area and management objective, 2015**

Type of reserve or open space	Approximate area (ha)	Management objective
National parks	83 423	To conserve the natural environment To provide for public use of the area for recreation, education and research
Nature reserves	18 534	To conserve the natural environment To provide for public use of the area for recreation, education and research
Wilderness areas	28 886	To conserve the natural environment in a manner ensuring that disturbance to that environment is minimal To provide for the use of the area (other than by vehicles or other mechanised equipment) for recreation by limited numbers of people, so as to ensure that opportunities for solitude are provided
Special-purpose reserves	3 432	To provide for public and community use of the area for recreation and education
Protection of water supply	6 377	To protect existing and future domestic water supply To conserve the natural environment To provide for public use of the area for education, research and low-impact recreation
Lakes	440	To prevent and control floods by providing a reservoir to receive flows from rivers, creeks and urban run-offs To prevent and control pollution of waterways To provide for public use of the lake for recreation To provide a habitat for flora and fauna
Total	141 092	–

ha = hectare; – = not applicable

Note: This table refers to land managed for conservation and other protected area purposes by Territory and Municipal Services, which is less than the area zoned for conservation purposes in Figure 5.1. The 'other land' in Figure 5.1 has various managers including ACTEW, the Commonwealth and private landholders.

Source: *Planning and Development Act 2007*



Soil condition

Why is this indicator important?

Soil condition or quality indicators evaluate how well soil functions relative to its inherent properties and constraints. Soil condition directly affects or correlates with environmental outcomes. Knowledge of soil condition informs assessments of land capability and appropriate land use that maximises the soil's potential.

Soil condition depends on soil type and properties. Soil type is important as a determining factor in soil properties and constraints, which in turn play a significant role in the behaviour of soils and what they can be used for. Although soil type is unlikely to change significantly in the short term, a range of events can cause disturbance to soil properties, including fire, floods, high-intensity storms, land clearing, agriculture, urban and industrial development, and recreation activities. ACT soils are highly variable, but most are considered to be infertile, fragile, and prone to becoming impermeable and eroded with inappropriate management.⁵ This suggests that it is particularly important for all land managers in the ACT to pay attention to management decisions that affect soil.

Current monitoring status and interpretation issues

Soil condition assessment most commonly measures soil salinity, acidity, erosion, sodicity and carbon.

There has been no recent systematic assessment of soil condition in the ACT. Baseline data on indicators of soils condition – such as carbon levels, erosion, acidity, sodicity or salinity – are required to be able to monitor changes in soil condition and to report on any state of, or trends in its condition.

Soil landscape mapping and the development of a hydrogeological framework are currently being conducted. These tools will provide baseline information about soil properties and constraints. Therefore, it is likely that information will be available so that this indicator can be commented on in the next State of the Environment Report.

Mapping of soil types was completed at the 1:100 000 scale for the eastern half of the ACT by the New South Wales Office of Environment and Heritage (OEH) in 1993 and 2000.⁹ The OEH has again been engaged by the ACT Environment and Planning Directorate to complete soil mapping for the eastern part of the Territory through the ACT Soil Landscape Mapping project. This is due to be completed by December 2015.¹⁰ As part of the mapping process, related soil types in each landscape will be described, and their chemical and physical properties and constraints identified.

The result of the mapping will be a consolidated ACT soil landscape map, which will provide information that facilitates sustainable land use and strategic development. It will not only assist planning for the most appropriate land use, but will also assist urban, rural and conservation land managers to manage the land according to its potential and limitations, thus preventing soil degradation and ameliorating existing problems. It will also indicate where soil monitoring and amelioration of degradation will be most beneficial. This information will also be used in the preparation of the Hydrogeological Landscape Framework project (see Case study 5.2 on page 140).

What does this indicator tell us?

Because of the lack of available data, the state and trends in the condition of soils in the ACT are not able to be reported for the 2015 reporting period.



Case study 5.2 ACT Hydrogeological Landscape Framework project

Hydrogeological landscape (HGL) frameworks build on soil landscape mapping by using additional information on geology, lithology, slope, soil depth, vegetation and climate to identify functional units for management within the landscape. The HGL framework concept can be used to address a wide range of land management issues, such as soil degradation (eg sodicity, acidity, erosion); soil carbon; biodiversity; and vegetation, revegetation and wetland processes (eg for hanging swamps, bogs and fens).¹⁰

The HGL framework is used to divide the landscape into areas that have similar hydrological characteristics. The resulting HGL units integrate information on lithology, bedrock structure, regolith (including soils), landforms, climate (including rainfall, seasonality, evaporation) and vegetation.¹¹

The ACT Hydrogeological Landscape Framework project will map individual HGLs and the different management areas within them at the 1:25 000 scale. The project will also help to determine the capability of rural, urban and conserved lands for a range of land uses and management objectives. Mapping will help identify key problems in each HGL and management area, and the options available to address them within land-use capability.

The project will also include an urban salinity pilot study; soil erosion/stability, soil carbon and wetlands frameworks; a climate change scenario for each HGL; and spatial identification of optimal locations for establishing biodiverse tree plantings and carbon sequestration.

For the salinity pilot study, the HGL unit descriptions will define salinity management areas, including:

- descriptions of how salinity manifests itself in the landscape
- the amount of salt stored in the landscape and its mobility
- the relative hazards associated with salinity and their likelihood of occurrence
- descriptions of soil landscapes, land and soil capability, land use, land degradation and other properties (Table 5.2).

Recommendations about how best to manage and prioritise these landscapes are also included. In this study, 25 different HGLs have been defined, each with unique salinity situations that require tailored management solutions involving specific management actions.¹⁰

The HGL project is funded through the Australian Government Regional Natural Resource Management Planning for Climate Change Fund.

continued



Case study 5.2 continued

Table 5.2 Salinity impacts for each hydrogeological landscape in the ACT

HGL	Land salinity impact	Salt load impact	EC impact on water quality	Overall salinity hazard
Bimberi	Low	Low	Low	Very low
Boboyan	Low	Low	Low	Very low
Brindabella	Low	Low	Low	Very low
Bruce	Moderate	Low	Low	Moderate
Bullen Range	Low	Low	Low	Low
Clear Range	Low	Low	Low	Very low
Gungahlin	Low	Moderate	Moderate	Low
Hall	Low	Moderate	Moderate	Low
Hoskinstown	Moderate	Moderate	Moderate	Moderate
Jeir Hill	Low	Moderate	Moderate	Low
Kambah Pool	Low	Low	Low	Low
Kowen	Moderate	Low	Low	Low
Lanyon	Low	Low	Low	Low
Majura Road	High	Moderate	High	High
Murrumbidgee Gorge	Low	Low	Low	Very low
Namadgi	Low	Low	Low	Very low
Orroral	Low	Low	Low	Low
Paddys River	Low	Low	Low	Very low
Picadilly	Low	Low	Low	Very low
Reedy Creek	High	Moderate	High	High
Royalla	Moderate	Moderate	Moderate	Moderate
South Canberra	Low	Moderate	Low	Low
Sullivans Creek	Low	Moderate	Moderate	Low
Symonston	Low	Low	Low	Low
Uriarra Road	Moderate	Low	Moderate	High

EC = electrical conductivity; HGL = hydrogeological landscape

Source: Muller et al¹⁰



Case study 5.2 continued

Majura Road hydrogeological landscape

An example of an area assessed as having a high risk of salinity is the Majura Road HGL. The following provides a summary of the type of information contained in the assessment and how this may be used in land management.

The Majura Road HGL extends from the Federal Highway in the north to Lake Burley Griffin in the south; it covers an area of 54 square kilometres and receives 550–750 millimetres of rain each year.

The Majura Road HGL is characterised by a catchment-based landscape on a broad valley bounded by steep hills and a major fault line. The area exhibits salinity via waterlogged patches and saline seeps with spike rush, which are seasonal. On the western flanks, there are saline springs in the upper slopes, as well as soils with severe salinity at a depth of 150 centimetres. There is a history of saline sites in the lower reaches of the unit, and salinity has remobilised recently at some sites following development. Monitoring bores and stream electrical conductivity sites indicate moderate salinity levels. Local developments, including the Majura Parkway, are affected by the local salinity and soil conditions.

The land use of the area is highly variable, and includes small areas of irrigated agriculture, grazing and cropping, Defence lands, airport infrastructure and reserve areas of native vegetation. There are important remnant grassland areas that act as biodiversity conservation areas in the lower landscape. Sand mining activities have previously occurred in the area.

Salinity is driven by interactions between water-use capacity of vegetation, physical soil properties and hydrogeological processes within the HGL.

The management focus for the Majura HGL is to recognise salinity impacts on infrastructure that will need to be planned for and taken into account during construction. Grazing management is a major factor in landscape stability, as the soils are very sodic and are easily subjected to erosion. A balance between multiple land-use and conservation issues needs to be struck in this unit to satisfy the wide range of competing interests.

Specific land management opportunities for this HGL are:

- existing remnant grasslands that can act as a seed bank resource
- planning frameworks into the immediate future.

Specific constraints for land management in this HGL include:

- acid sulfate and salinity impacts on infrastructure, particularly road construction and buildings
- total grazing pressure on government lands
- the airport envelope with regard to noise and height restrictions
- increased peri-urban development in competition with agricultural land.



Compliance with the National Environment Protection Measure standards

The Assessment of Site Contamination NEPM provides a framework for a national approach to the assessment of contaminated land.¹²

Why is this indicator important?

Compliance with the Assessment of Site Contamination NEPM standards ensures that the ACT is achieving the national environment protection standards for assessment of contaminated sites and that the assessment is being undertaken appropriately. This NEPM does not deal with remediation. National remediation guidance is being developed by the Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, with final documents due to be considered in 2016–17.

Current monitoring status and interpretation issues

The Assessment of Site Contamination NEPM must be taken into account in all assessment of land contamination in the ACT as prescribed in the *Environment Protection Act 1997*.¹³ The NEPM states that ‘there should be a consistent approach to the assessment of site contamination across Australia but each participating jurisdiction may implement the necessary controls in its own manner’.¹⁴

What does this indicator tell us?

The ACT Government demonstrates compliance with the NEPM by reporting each year on the implementation and effectiveness of the NEPM in the ACT. This information is published in the National Environment Protection Council’s annual report. Site-specific or ACT-specific data are not reportable as part of this NEPM.

Number and type of contaminated sites

Why is this indicator important?

Contaminated sites occur as a result of current or former land use. Contaminated sites in the ACT are related mostly to former petrol stations or other fuel storage activities. As the rate of urban infill and greenfield development increases, contaminated sites such as former petrol stations, landfill sites and sites with previous chemical uses (such as sheep dips) are increasingly likely to be designated for development.

The identification of contaminated sites allows their remediation, if required, and allows appropriate land use to be considered for the sites. In this way, development can be a driver for both the increased reporting and remediation of contaminated sites. One example is the Kingston Foreshore, which was remediated so that the area could be developed for residential purposes. Given the development throughout the ACT, it is reasonable to expect an increasing number of reported and remediated sites.

Current monitoring status and interpretation issues

Contaminated sites are generally identified by consultants when undertaking an environmental assessment to determine the suitability of a site for a proposed change of use. The sites are notified to the Environment Protection Authority (EPA) either formally under s. 23A of the *Environment Protection Act 1997* (when specific triggers have been met) or informally in environmental site assessment reports. The EPA is the custodian of all data that relate to known and potentially contaminated sites.

The EPA has the regulatory responsibility for the oversight of the remediation of contaminated sites, and oversees the framework that regulates this process. However, the polluter or the current owner of the site is responsible for ensuring the remediation works are carried out. Generally, sites are voluntarily assessed and remediated by the person redeveloping a site.



The remediation process and the ongoing monitoring of the sites are undertaken by EPA-approved auditors and reported to the EPA, which undertakes an audit of assessments and validation by consultants. Old petrol station sites, or those that were used for fuel storage, often require ongoing monitoring for hydrocarbon vapour (or light nonaqueous phase liquid) and for leaching into the watertable, which may have resulted in subsurface plumes. Other historic rural sites may be remediated with no further monitoring required.¹⁵

The development of greenfield sites can also lead to the discovery of contamination from sheep dips or landfill sites.

The number and type of contaminated sites for the current reporting period are calculated by adding the new sites from GIS data to the reporting total for the previous reporting period. These figures include remediated sites and active contaminated sites. Remediated sites are not currently removed from the contaminated sites register, to ensure that future uses of these sites are compatible with site remediation. For example, a site may be remediated to a level that can accommodate industrial development, but may not be appropriate for residential development.

What does this indicator tell us?

There are currently 1014 contaminated sites recorded in the ACT, including fuel sites, sheep dips, landfills and other (Table 5.3). Of the 61 hydrocarbon sites reported during the 2015 reporting period, the majority were identified as a result of the redevelopment of commercial sites. The majority of the 10 landfill sites were associated with uncontrolled landfill identified in greenfield development sites. One new sheep-dip site – in addition to the known sites – was also identified during a study of the proposed Greater Kenny greenfield development area. The 34 sites identified as ‘other’ were associated with the identification of former chemical storage sites, former Defence sites and naturally occurring heavy metal gossan sites.

There has been an increase of 115 recorded contaminated sites since the end of the previous reporting period (Table 5.4).



Land clearance for development at Wright

Photo: ACT Government

**Table 5.3** Number and type of contaminated sites in the ACT, 2015

Type of contamination	Description	Reported from 1 July 2011 to 30 June 2015	Total number
Hydrocarbon	Former petrol stations or other fuel storage	61	543
Cattle or sheep dips	A site, such as a trough containing pesticides, used to rid sheep or cattle of parasites	10	153
Landfills	Usually uncontrolled landfill sites on unused or rural land	1	122
Other	Former chemical storage sites, former fill sites, former Defence sites or naturally occurring heavy metals	34	196
Total	—	106	—

— = not applicable

Source: Data provided by the ACT Environment Protection Authority, July 2015

Table 5.4 Total number of contaminated sites in the ACT, 2007, 2011 and 2015

Year	Total number of contaminated sites
2007	752
2011	899
2015	1014

Source: Data provided by the ACT Environment Protection Authority



Looking down on Namadgi National Park from Square Rock

Photo: ACT Government



Assessment summaries for land indicators of state and trend

Indicator	Reasoning	Assessment grade					Confidence	
		Very poor	Poor	Fair	Good	Very good	In state grade	In trend grade
Land use	<p>Approximately 57% of the ACT is nature reserves and other protected areas, and 816 ha has been added to the reserve network in the reporting period.</p> <p>The majority of native forests are zoned for conservation purposes under the Territory Plan, with a small percentage for multiple-use public land and private land. This indicates that a large proportion of the ACT is likely to be used and managed in a way that protects ecological values.</p> <p>Greenfield developments accounted for 1420 ha of all development during the reporting period. Greenfield developments place pressure on the environment.</p> <p>Confidence in the grade is good as the extent of conservation areas is well known and reported.</p> <p>Confidence in the trend is medium, because the amount of land likely to be added to the conservation estate is unknown and largely dependent on offset requirements for future development.</p>							
Soil condition	<p>Due to recent work on soils, baseline data are available for salinity across the ACT. However, there are little data available on other indicators of soil health such as carbon levels, erosion, acidity or sodicity in the ACT.</p> <p>Soil and hydrogeological landscape mapping are currently under way; this means that it is likely that information will be available in the next report.</p> <p>The lack of available data means that the state and trends in the condition of soils in the ACT are not able to be reported</p> <p>Confidence in state and trend is low due to a lack of available data.</p>							



Indicator	Reasoning	Assessment grade					Confidence	
		Very poor	Poor	Fair	Good	Very good	In state grade	In trend grade
Extent and condition of contaminated sites	<p>The ACT has 1014 known contaminated sites, an increase of 115 since 2011.</p> <p>Numbers of contaminated sites identified are likely to continue to increase as more are discovered due to development.</p> <p>When sites are uncovered, the likelihood of remediation improves.</p> <p>Confidence in the current state is medium, because the extent of unidentified sites is unknown.</p> <p>Confidence in the trend is medium.</p> <p>Although the number of contaminated sites is likely to continue to increase, the rate of increase is largely linked to the discovery of contaminated sites on land that is to be developed.</p>							
Compliance with Assessment of Site Contamination NEPM	<p>The ACT Government demonstrates compliance with the NEPM by reporting annually on the implementation and effectiveness of the NEPM in the ACT.</p> <p>Confidence in state and trend is high</p>							

ha = hectare; NEPM = National Environment Protection Measure

Recent trends



Improving



Stable



Deteriorating



Unclear

Confidence



Adequate high-quality evidence and high level of consensus



Limited evidence or limited consensus



Evidence and consensus too low to make an assessment



5.3.2 Pressures

The major pressures on land in the ACT are changes to land use, particularly greenfield development. Resilience to pressure on our land resources will require careful management to balance the needs of urban development with environmental protection.

Land-use change

Why is this indicator important?

Patterns and changes in land use directly affect environmental values, often adversely.¹⁶ Two indicators are used:

- number and type of development applications
- greenfield versus infill urban development.

Current monitoring and interpretation issues

The ACT's population is projected to grow from an estimated 365 000 in 2011 to 457 300 by 2030. With this growth comes the need to supply more housing and associated infrastructure. This continued urban expansion threatens Canberra's rural and bush setting, and the connectivity of its ecosystems.¹⁷

Urban intensification will also continue to increase. This type of development often uses land that has been developed previously (ie change of use) or vacant land within highly modified landscapes; the effects on land condition are likely to be less than for greenfield development. However, the actual effects depend on the type and method of development.

The predicted climate change and climate variability scenario for the ACT includes increased temperatures, less rainfall and/or different rainfall patterns, and more extreme weather events, including an increase in fire weather events. These changes are likely to affect landscape functions and ecosystems and, in turn, land use and management.

Although land-use zones and overlay zones determine the activities that may occur on land, the impacts to the land come from the type of use or management that occurs under that zoning. For this reason, this indicator measures:

- number of development applications
- greenfield versus infill development.

What does this indicator tell us?

Development applications

The ACT Government tracks the number and type of development applications received each year in the ACT, from both government and private developers.

The number of development applications lodged with the ACT Government during 2007–2011 and 2011–2015 has remained relatively stable (Table 5.5). Column 3 ('Development application – exempt residential building applications approved') presents data on building approvals completed for new residences, which became exempt from requiring a development application from 2008–09 onwards. Before the introduction of the *Planning and Development Act 2007* on 31 March 2008 and the endorsement of the new Territory Plan 2008, these applications would have required a development application. At this time, development application exemptions for single residential houses only included houses built on land in greenfield areas. The exemption provision was amended on 25 April 2009 to include knockdown rebuilds in established areas. A number of other small-scale developments – including some additions and alterations such as garages, carports and pergolas – became exempt from development application at the same time. The development application exemption provisions were expanded on 24 March 2009 as a result of the Australian Government's stimulus package program to exempt work on schools. The large number of development applications in 2007–08 therefore includes buildings and constructions projects that, in later years, only required a building approval and reflects an increase in applications due to uncertainty among the building industry around the anticipated change. Other than these two years, numbers have remained fairly stable, with only minor fluctuations (Table 5.5).



Table 5.5 Development applications lodged and development application exempt residential building applications approved, 2007–08 to 2014–15

Year	Number of development applications lodged (residential, commercial, institutional)	Development application – exempt residential building applications approved
2007–08	4429	No DA – exempt provisions for new residences
2008–09	2385	1079 BAs issued for DA – exempt residences only
2009–10	1595	2155 BAs completed for DA – exempt residences only
2010–11	1293	1577 BAs completed for DA – exempt residences only
Total for 2007–2011 reporting period	9702	4811
2011–12	1136	1665 BAs completed for DA – exempt residences only
2012–13	1207	1591 BAs completed for DA – exempt residences only
2013–14	1116	1707 BAs completed for DA – exempt residences only
2014–15	1218	1115 BAs completed for DA – exempt residences only
Total for 2011–2015 reporting period	4677	4579

DA = development application; BA = building approval

Source: Data provided by the Chief Minister, Treasury and Economic Development Directorate; Access Canberra; Customer Services Section and Shared Services; Environment and Planning Directorate Information and Communications Technology team

Once received, development applications are assessed and a decision is made on whether or not to approve the application. The assessment is made by the Planning and Land Authority (under the *Planning and Development Act 2007*), taking into account all representations made during the public notification period, advice from other entities and likely impacts of the development, including the environmental impact.¹⁸ Once an application is received, it is lodged in either the merit or impact tracks.

The type of development likely to be assessed under the merit track includes development in a residential zone. These applications are assessed against the relevant code of the Territory Plan,

the zone objectives, the suitability of the land for the development and any probable impacts.

The type of development likely to be assessed under the impact track includes proposals likely to have a significant environmental impact. There are a number of circumstances that trigger assessment under the impact track, which are specified in s. 123 of the Planning and Development Act. These include if the proposed development meets specific criteria in the Territory Plan, if a ministerial declaration is made regarding the proposal, or if it is a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth). Schedule 4 of the *Planning and Development Act 2007* sets out the



types of development proposals that will be assessed under the impact track because they need to have an Environmental Impact Statement (EIS). The process of assessment under the impact track is similar to the merit track, but may include an EIS assessment. Greenfield developments are likely to require assessment under the impact track.¹⁸

Greenfield versus infill development

The ACT Planning Strategy acknowledges that ‘greenfield expansion requires more land, which presents economic and environmental costs and that most remaining “urban capable” land presents significant financial and environmental costs because of its location, terrain and areas of endangered habitats’.¹⁷ Greenfield urban development places greater pressure on the land and the environment because of the likelihood of vegetation clearance and other permanent changes to the development area. In addition to the increase in urban area, greenfield developments often lead to associated indirect impacts, such as increased greenhouse gas emissions through additional infrastructure and transport needs, increased recreational use and access tracks, garden weed invasion, and bush rock and firewood collection.

Fire management requirements for greenfield developments can also affect the biophysical environment. Greenfield developments require asset protection zones. These zones are managed to reduce fuel loads for the purpose of protecting residential areas.¹⁹ Asset protection zones can increase the development footprint, which may result in loss of, or significant negative impacts on, ecological communities.

However, on a positive note, greenfield development can result in pressure to clean up contaminated sites that pose unacceptable health risks. Fire management inner protection zones can be achieved by reducing the developable area rather than increasing the footprint.

Urban infill generally has less direct impact on ecological values than greenfield development, because it requires a smaller development footprint and a reduced need for new infrastructure. The benefits can be increased with sensitive design and low environmental impact land-use types.

The ACT Government – through the Land Development Agency – prepares an Indicative Land Release Program each year, which sets out the Government’s intended residential, commercial, industrial, and community and nonurban land releases. Although the percentage of greenfield development is higher than infill for this reporting period, it is significantly lower than in the previous reporting period, and projections show that this trend is likely to continue (Table 5.6).

As reported in Section 5.3.1: State and trend, the total area of greenfield urban development during the reporting period was 1420 ha.

Table 5.6 Current and predicted split between greenfield and infill development, 2007–2018

Timeframe	Greenfield development (%)	Infill development (%)
2007–2011	75	25
2011–2015	55	45
2013–2017	44	56
2014–2018	48	52

Source: Data provided by the Land Development Agency, based on the actual residential dwelling count during the reporting period; predicted figures are based on the ACT Government’s Indicative Land Release Program for future periods.



Assessment summaries for land indicators for pressures

Indicator	Reasoning	Assessment grade					Confidence	
		Very low	Low	Moderate	High	Very high	In state grade	In trend grade
Development applications	<p>The number of development applications lodged between 2007–2011 and 2011–2015 decreased, mainly due to peaks in 2007–08 and 2008–09.</p> <p>Apart from these two years, numbers have remained steady.</p> <p>There is an expectation that development will continue to occur but will be managed effectively to reduce impacts.</p> <p>Confidence in current state is high</p> <p>Confidence in trend depends on economic conditions.</p>							
Greenfield versus infill development	<p>Total area of greenfield urban development during the reporting period was 1420 ha.</p> <p>In 2011–2015, the ratio of greenfield to infill decreased significantly from 75%:25% to 55%:45%.</p> <p>Projections show that this trend is likely to continue. The ratio is estimated to be 44%:56% by 2017 and to rebound slightly to 48%:52% by 2018.</p> <p>Confidence in state is high.</p> <p>Confidence in future trends is lower, as trends depend on economic conditions and societal attitudes to infill.</p>							

Recent trends



Improving



Stable



Deteriorating



Unclear

Confidence



Adequate high-quality evidence and high level of consensus



Limited evidence or limited consensus



Evidence and consensus too low to make an assessment

Resilience to pressures

A resilience assessment involves looking at the systems, networks, human resources and feedback loops involved in maintaining environmental values (see Chapter 9).

Because land forms such an important basis for the delivery of multiple ecosystem services, it is in the interest of human wellbeing to ensure that it is resilient – that is, that particular land uses do not severely undermine the provision of benefits, and that the environmental values of land are able to be regained after major shocks and disturbances (see Australian State of the Environment Committee²⁰).



The resilience of land-related processes depends on the aspects of land examined. This section considers the resilience of processes related to land development and planning, and soil quality.

The outcomes desired from management of land development and planning are well articulated in the ACT. There are clear policies regarding targets for development, and clear guidelines for characteristics and values to be maintained. For example, there are policies guiding the ratio of greenfield to infill release of land for residential development. Community consultation has been used to help identify these characteristics and values – however, debate remains about how to achieve some of them. There is strong consensus about the importance of having high-quality public open spaces, but there remains debate about the relative environmental impacts of different urban density approaches. Strong public debate does not always translate to processes in which a consensus on values is reached.

Soil management is also well defined. There are core standards and knowledge for what is healthy soil (eg limiting erosion, maintaining fertility, limiting pollution and contamination). However, a comprehensive set of specific standards for each of these values with reference to the ACT's soil types is not currently available within present ACT resource capacity.

Key threats to maintaining desired values from land, such as open space and healthy soil, are known, with a common focus on economic drivers of development and planned population growth. Although generalised threats are known, there is less agreement about the specifics of when development or specific land management activities represent threats to achieving desired outcomes. For example, some processes that threaten soil condition are reasonably well understood, such as erosion, salinity and soil contamination by pollutants. However, there is less understanding of threats to soil biota and microbial diversity, and more limited knowledge of current soil management practices and their impacts. What represents a contaminated site is reasonably well understood, but identification of contaminated sites is often limited until development or disturbance occurs. There are several processes for identifying threatening processes, including the state of the environment reporting process, the ACT Planning Strategy and

future reviews of this strategy, and site-focused assessments related to individual developments.

Although thresholds for land management are set with regard to contamination of soil and aspects of livability such as traffic density, service provision and green space, these thresholds are mainly assessed when a specific development occurs, with reference to landscape-scale plans against which site-by-site proposals are assessed. A shift is occurring in strategic assessments that consider a landscape approach to land management under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth), and there are requirements to monitor and report each year under this Act. More of this strategic approach at a broader scale is required – along with improved landscape-wide monitoring and specification of thresholds at which land-related values are considered to be under threat. In some cases, there is no knowledge of thresholds to enable effective monitoring. For example, factors such as soil chemistry, soil loss and soil biota, and drivers of soil quality such as vegetation cover, are not monitored consistently or regularly.

The small size of the ACT Government enables good connectivity among government agencies, and between agencies and developers. There are smaller and less connected networks related to soil condition, although there are strong links between key staff and rural landowners with regard to land management.

A lack of landscape-level monitoring – and, in some areas, a lack of agreed values and outcomes – limits the effectiveness of current processes to maintain desired characteristics related to land. There is a focus on monitoring and assessment up until the point that large developments are approved and established. However, follow-up monitoring is limited, which significantly constricts the opportunity for feedback about land-use changes. Limited mapping of vegetation on rural lands also reduces opportunities for feedback. The lack of feedback – especially from postdevelopment monitoring – restricts the ability to learn and adapt.



5.4 Response

The tension between environmental protection and urban development is a fundamental challenge for the ACT Government. Nonetheless, as is illustrated in Chapter 7: Biodiversity, there is clear evidence of the ACT's commitment to environmental protection. Approximately 57% of the Territory's total 235 813 ha is contained in areas permanently designated as either nature reserve or national park. This is more than 10% higher than any other Australian jurisdiction, and significantly higher than the national average of 17.88%.

The ACT Government manages land use and land-use impacts in the ACT in a variety of ways, which are assessed in detail in Chapter 10. Particular features of land management and responses from the reporting period are included in this section.

5.4.1 Legal and policy framework

Land ownership or custodianship governs who manages land in the ACT and how it is managed, including the activities that are allowed to take place on the land.

The *Planning and Development Act 2007* provides the following definition:²¹

A custodian for an area of land is an administrative unit or other entity with administrative responsibility for land in the ACT that is unleased land, public land or both. (Note: Entity includes an unincorporated body and a person (including a person occupying a position).)

Two organisations are responsible for land-use planning and management in the ACT: the ACT Planning and Land Authority and the National Capital Authority (NCA). Land owned by the ACT Government is managed by directorates across Government. According to the Territory Plan, 'Territory Land means Territory Land under the *Australian Capital Territory (Planning and Land Management) Act 1988* (Cwlth)', which states that 'if land in the ACT is not National Land it is Territory Land'.²²

Although the ACT Government owns the majority of land in the Territory, some land is owned by the Australian Government under the management of a number of departments, including the NCA, the Department of Defence and the Commonwealth Scientific and Industrial Research Organisation (CSIRO). Lake Burley Griffin and the entryway into Canberra are two examples of land that is under the planning jurisdiction of the NCA.

Planning and Development Act 2007

Land use in the ACT is determined through the *Planning and Development Act* and the Territory Plan 2008 created under it. The object of the *Planning and Development Act* is to:²¹

... provide a planning and land system that contributes to the orderly and sustainable development of the ACT consistent with the social, environmental and economic aspirations of the people of the ACT; and in accordance with sound financial principles.

The *Planning and Development Act*²³ defines sustainable development as:

the effective integration of social, economic and environmental considerations in decision-making processes, achievable through implementation of the following principles:

- *the precautionary principle*
- *the intergenerational equity principle*
- *conservation of biological diversity and ecological integrity*
- *appropriate valuation and pricing of environmental resources.*

The Land Development Agency was established under the *Planning and Development Act*. The agency's functions relating to land use include developing land, carrying out works for the development or improvement of land, and carrying out strategic or complex urban development projects.



Strategic Environmental Assessments

The Planning Act provides for the use of Strategic Environmental Assessments (SEAs). These assessments are designed to cover major land-use policy initiatives or major plan variations.

SEAs are aimed at major government initiatives (such as major urban land-release programs) that have potential implications that:

- cut across a number of planning policy issues, including social, built environment, heritage, cultural, biological and ecological issues
- require the analysis of synergistic and cumulative impact issues.

In this case, the SEA may set an overall assessment framework with several parts, such as an action plan under the *Nature Conservation Act 2014*. The SEA framework could be used to inform an instrument such as the action plan.^{d,e}

ACT Planning Strategy (2012)

The ACT Planning Strategy (2012)²⁴ is also established under the Planning and Development Act. The strategy was released early in the reporting period and replaced the Canberra Spatial Plan.

The strategy addresses the challenges confronting the ACT in the face of the city's continuing growth, while maintaining important environmental values. The strategy aims to do this through directing the development of Canberra to help achieve economic, cultural and environmental goals. Within the broader strategy are several strategies and actions to achieve these aims. This includes strategy number eight, which is to:²⁴

Value the land and natural resources of the region by working collaboratively to manage urban growth, ensure connectivity and continuity in the natural systems and conserve, where appropriate, agriculturally productive land. (p 58)

Although the strategy does not have statutory effect, it will serve to guide future planning and development

in the ACT, and it is important that managing Canberra's growth to maintain connectivity and other environmental values is recognised.

While all of the outcomes and actions within the strategy relate to land use, some more than others are specifically related to types of land use and land condition. These include:

- increasing urban infrastructure and providing urban parks (or urban green space)
- improving Canberra's resilience to change and environmental sustainability through design measures, such as plans for urban areas that include the creation of wildlife and vegetation links to improve ecosystem services
- valuing our land and natural resources by managing urban growth
- ensuring the connectivity and continuity of natural systems.

The strategy notes that detailed consideration of habitat connectivity opportunities is needed in the design and management of urban areas. It recognises the need to provide movement corridors for fauna species through preserving or creating these spaces as a part of urban developments.¹⁷

The strategy also recognises the need to use land more efficiently and reduce the amount of land used per capita. Methods to achieve this include increasing infill development and incorporating multiple uses into existing urban areas. Specifically, the strategy aims to deliver at least 50% of new housing requirements through urban intensification.¹⁷

Other plans and policies

The Territory Plan directs planning and development in the ACT by, for example:

- setting out how land is used and what can be built on it
- guiding the development of future urban areas and the management of public land.

d Note that, where the chief issue at hand is the potential impact on a particular ecological community, an action plan may be the more appropriate vehicle for assessment and consultation.

e www.legislation.act.gov.au/es/db_27987/default.asp



Land in the ACT is divided into sections and blocks. Each of these blocks is zoned, and it is the zoning that determines what the land may be used for and how it may be developed.²⁵

The National Capital Plan is the Australian Government's strategic plan for Canberra and the ACT. This plan aims to ensure that 'Canberra and the Territory are planned and developed in accordance with their national significance'.²⁶

5.4.2 Management of pressures

Rural Land Management Agreements

Rural lessees are required to sign a rural Land Management Agreement (LMA) with the ACT Government regarding the management of the land they are leasing. An LMA provides a basis for a cooperative land management regime between lessees of land in the ACT and the ACT Government agencies responsible for managing rural and nonurban land for the Territory.

An LMA is required under s. 283 of the Planning and Development Act for all rural leases. A rural lease is only granted if the lessee has entered into an LMA with the ACT, and this agreement must be signed by the Conservator of Flora and Fauna and the person leasing the land.²⁷ There are currently 110 rural leases in the ACT.

An LMA has three principal components:

- a statement of responsibilities, which outlines the agreed responsibilities of the lessee and the ACT, and identifies the minimum and desirable management standards to be achieved during the term of the LMA
- a site assessment, which is intended to document the current state of the lease, and to recognise appropriate management and resolution of past management issues; it is primarily an environmental audit of the property to be completed by the lessee and is to be conducted at least every five years
- a land action plan, which accompanies each site assessment and outlines the management strategies by lessees to resolve particular land management problems on the subject site. It may include a commitment by the ACT to initiate works in relation to the subject site or adjacent land.



Land management agreements are in place over rural land in the ACT. The photo shows rural land to the east of Canberra looking to Mt Tennent
Photo: Office of the Commissioner for Sustainability and the Environment



Lake Burley Griffin and surrounding land are an example of National Land in the ACT

Photo: ACT Government

Although LMAs provide a mechanism for planning and tracking land use and management on leased rural land, the agreements are not regularly monitored for compliance or enforcement purposes, or based on the type of rural land use and areas of environmental concern.

Management strategies

The ACT Nature Conservation Strategy was released by the Environment and Planning Directorate (EPD) in 2013. It includes a number of strategies and actions designed to improve nature conservation in the ACT. These actions include the development of an ACT Soils Strategy and other actions to improve knowledge of landscape function across the ACT.

A Soils Strategy will provide a strategic approach for developing baseline soil data and an ongoing soil condition monitoring program. As part of the strategy's development, the EPD has engaged the New South Wales Office of Environment and Heritage to develop a hydrogeological landscape (HGL) framework

for the ACT and region (see Case study 5.2 on page 140). The HGL framework will assist in determining the capability of rural, urban and conserved lands for a range of land uses and management objectives. Mapping will help identify key problems in each HGL and management area, and the options available to address them within land-use capability. Soil landscape mapping and development of an HGL framework will provide baseline information on soil properties and constraints, and indicate where soil condition monitoring and amelioration of degradation would be most beneficial.

Other actions under the ACT Nature Conservation Strategy aim to improve knowledge of landscape functions, including mapping of native vegetation and vegetation connectivity, and mapping of serious environmental weeds across the ACT. Along with the soils mapping and the HGL, this work will allow better understanding of appropriate land uses and inform land-use planning.



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