

ACT State of the Environment Report 2011

THEME: Biodiversity

Indicator cluster: Native species - flora

The indicators in this cluster are:

- *Status of native species (C)* - status of native plants including threatened species listings and other data for common species;
- *Native seed harvesting (P)* - extent and distribution of native seed harvesting;
- *Weed impacts (I)* - nature of weed impacts on native species; and
- *Threatened species conservation (R)* - effectiveness of threatened species plant conservation.

Summary

Currently 1655 plant species (native and introduced) are recorded as occurring in the ACT, but this list is not exhaustive and is expected to increase as additional species become naturalised, and as species of moss and lichen are included in the future.

In total, 8 plant species are listed as threatened with extinction under the ACT *Nature Conservation Act 1980*. There have been no new listings of plant species as threatened since the 2007 reporting period, but the riparian shrub *Bossiaea grayi* (only known from the ACT) is currently being assessed for listing as a threatened species.

Introduction

Both native and introduced plants provide habitat and food for fauna. Changes in patterns of abundance of native plant species in a given area can occur naturally, as a result of seasonal conditions or because of significant events such as fire or storms. Disappearance of a significant native plant species from an area is typically an indicator of a major impact to an ecosystem. It may be a result of loss of habitat because of urban development, agriculture or competition from introduced species. The species composition of a native plant community can also be affected by overgrazing, weed infestation, seed gathering and/or firewood harvesting.

This indicator cluster focuses on native plant species listed as threatened under the ACT *Nature Conservation Act 1980* (ACT Government 2011). Species that are of concern to the Flora and Fauna Committee are those that are uncommon and/or are declining in abundance. The committee is interested in the likely reasons for a

Condition indicators (C) present data on the state of the environment at any particular time.

Pressure indicators (P) present data about the main human activities that could potentially adversely affect the condition of the environment.

Impact indicators (I) present data on the effects of environmental changes on environmental or human health.

Response indicators (R) present data about the main things we are doing to alleviate pressures, or to improve the condition of the environment.

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decline or change in abundance of any threatened species, and whether those reasons are being addressed by Recovery Plans and Action Plans.

Condition indicators

Status of native species

As of December 2008, there were 1655 native plant species recorded in the ACT by the ACT Government and the Australian National Herbarium Centre for Plant Biodiversity Research. This number includes 1575 vascular flowering plants including grasses, herbs, shrubs and trees. The remaining 80 records are for non-vascular cryptogamic flora such as hornworts and liverworts (Lepschi et al. 2008). The census list includes 550 exotic species (not native to ACT) that display varying degrees of persistence and naturalisation in the ACT (Lepschi et al. 2008).

The Nature Conservation Act makes provision for the protection and conservation of native plants. Under the Act, a species may be declared as vulnerable or endangered if there are reasonable grounds for believing that the species is threatened with extinction. The Act establishes a formal process for the identification and protection of threatened plant species in the ACT, and lists:

- vulnerable species - species that are likely to become endangered in the next 25 years; and
- endangered species – a species in immediate danger of extinction, unless the circumstances and factors threatening its distribution composition and viability cease.

In the ACT, 8 native plant species are listed as endangered under the Act. These are given special protection status; none is listed as vulnerable. Under the Act all orchids local to the ACT, most native local ferns and 28 other native plants are listed as protected. A licence must be obtained prior to any destruction or damage of these species.

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) lists species of flora and fauna declared nationally as threatened or endangered (Australian Government 2011). In the ACT, 12 species that are nationally threatened and listed under the EPBC Act are considered to have suitable habitats (Table 1). Each of these species is given special protection status under the Nature Conservation (Special Protection Status) Declaration 2011 under the ACT Nature Conservation Act. The list of protected plants is currently under revision.

All threatened plant species that occur in the ACT and are listed under the ACT Nature Conservation Act and EPBC Act are shown in Table 1, along with their status. The *2007-08 ACT State of the Environment Report* reported that two threatened plant species had been listed under the Act during that reporting period. The EPBC Act had listed 4 species which are known or predicted to have occurred in the ACT during the same period. However, during the current reporting period no additional threatened plant species have been listed under the Act, while 1 species has been

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listed under the EPBC Act. A nomination to list the riparian shrub *Bossiaea grayi* (known only from the ACT) as a threatened species under the Nature Conservation Act is currently under assessment.

Table 1. Threatened species listings and status for the ACT
(NC Act indicates ACT Nature Conservation Act)

Name	Protection listing	Status
Canberra Spider Orchid (<i>Arachnorchis actensis</i> <i>Syn. Caladenia actensis</i>)	NC Act - Endangered EPBC Act - Critically Endangered	Currently the species is known only from the lower slopes of Mt Majura and Mt Ainslie in the ACT. This species was surveyed for the first time in 2008. No plants were located but this was likely due to seasonal factors. More than 100 plants were observed during the 2009-10 flowering season.
Brindabella Midge Orchid (<i>Corunastylis ectopa</i>)	NC Act - Endangered EPBC Act - Critically Endangered	The species was first discovered in 1992 as a small population of approximately 70 plants. Endemic to the ACT, and known only from a single site in the Brindabella Range. The largest number of Brindabella Orchids was recorded in the 2009-10 season, with 78 plants counted and tagged. In 2011, 72 plants were tagged. Total number of individual plants tagged in the last 2 years is 110 (CPR 2010).
Small Snake Orchid (<i>Diuris pedunculata</i>)	NC Act - Special Protection species EPBC Act - Endangered	Spatial data on the distribution of this species in the ACT is maintained (G. Baines pers. comm 2011).
A subalpine herb (<i>Gentiana baeuerlenii</i>)	NC Act – Endangered EPBC Act - Endangered	Annual counts have been carried out at the last known location of this herb, but it has not been observed since 1998.
Ginninderra Peppercross (<i>Lepidium ginninderrense</i>)	NC Act - Endangered EPBC Act - Vulnerable	This species only occurs on land owned by the Australian Government Department of Defence which monitors it on a regular basis. The data are not routinely provided to the ACT Government. The National Botanic Gardens maintains a seed collection and propagates this species.
Hoary Sunray (<i>Leucochrysum albicans</i> var. <i>Tricolor</i>)	NC Act - Special Protected Species EPBC Act - Endangered	Spatial data that includes the distribution of this species is maintained and updated as required. The species is too numerous within the ACT to estimate abundance (G. Baines pers. comm 2011).
Tuggeranong Lignum	NC Act -	There are 10 known wild plants, all of which were

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Name	Protection listing	Status
<i>(Muehlenbeckia tuggeranong)</i>	Endangered EPBC Act - Endangered	healthy during inspections undertaken in 2011; 93 clones of these wild plants have been introduced into suitable habitat in the Murrumbidgee River corridor. Approximately 50% of these plants were alive when inspected in 2011.
Pale Pomaderris <i>(Pomaderris pallida)</i>	NC Act - Special Protected Species EPBC Act - Vulnerable	Spatial data that include information on distribution of this species are kept and maintained by ACT Government
Leek Orchid <i>(Prasophyllum petilum)</i>	NC Act - Endangered EPBC Act - Endangered	The species is known from only one site in the ACT in the Hall cemetery, where more than 70 plants have been recorded. The abundance of the flowering population at Hall cemetery has fluctuated widely since monitoring began in 1991. This trend was again evident in the 2010 annual survey with an increase in the total flowering plants recorded from 26 in 2009 to 47 in 2010. However in 2010 the number of new plants flowering declined. The low abundance in 2009 was not unexpected given the species annual abundance has regularly fluctuated since monitoring began in 1991. No obvious link has been identified between marked fluctuations and the preceding year's abundance (CPR 2010). The survey will be repeated at the same time in spring 2011.
Button Wrinklewort <i>(Rutidosis leptorhynchoides)</i>	NC Act - Endangered EPBC Act - Endangered	The recovery actions for this plant species require completion of full quantitative surveys once every 5 years. The next full survey is due in 2012-13 (CPR 2010).
Small Purple Pea <i>(Swainsona recta)</i>	NC Act - Endangered EPBC Act - Endangered	This species is found in 5 locations within the urban areas of Canberra. The largest population occurs in the Mount Taylor Nature Reserve with a stable population of over 300 individual plants recorded at this site. A total of 337 individuals have been recorded across all 5 locations since surveying began in 2001. Abundance of plants at the 4 other sites is low. Surveys have revealed that the populations at the other 4 locations have remained steady but no new plants have been identified since 2003.
Austral Toadflax <i>(Thesium australe)</i>	NC Act - Special Protected Species. Species is common in the ACT.	Spatial data on species distribution are kept and maintained by the ACT Government

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Name	Protection listing	Status
	EPBC Act – Vulnerable	

Source: Australian Government 2011

Pressure indicators

Key pressures on native flora include climate change, fire, weeds and urban development. These are discussed in the *Threatening processes* indicator cluster paper.

Native seed harvesting

Sustainable native seed harvesting opportunities are properly a response indicator. Harvesting helps provide vital resources for the restoration of degraded landscapes and assists in enhancing native biodiversity. It is particularly important for the recovery of areas of high conservation value including endangered ecological communities. However, there are pressures that occur with high demand and reduced availability. Consequently this report has highlighted seed harvesting as a pressure indicator rather than including it as a response indicator.

In 2009, there were 6 ACT-based Seed Production Areas (SPAs) that had been established to produce and supply native seed to the ACT (Australian Government 2008). The SPAs help to complement stocks of native seed sourced to support revegetation projects. However, in the last 2 years, 3 of the SPAs have ceased production as a result of either a change in land ownership, where the new owners have not been interested in supporting the SPA, or a lack of landholder commitment, or species failures.

The *2007-08 ACT State of the Environment Report* reported that there is limited seed kept in store, and there is frequently a turn-around time of over a year to collect adequate seed locally for some of the large-scale projects.

The quantity of seed stored has been improved in this reporting period, with approximately 1000 kg from 150 species of local provenance stored in Greening Australia's seed bank. Seed collection has focused primarily on understorey species of the Yellow Box-Red Gum Woodlands. Greening Australia, with funding from a variety of sources, continues to work closely with the CSIRO, the Australian National Botanic Gardens and the ACT Natural Resources Management Council (ACT NRM) in relation to seed collection programs (Greening Australia).

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Impact indicators

Weed impacts

Weeds in the ACT cause concern in relation to biodiversity and agricultural productivity. They invade native plant communities and can out-compete native species, resulting in a reduction in plant diversity and loss of habitat for native animals. Once weeds establish in a native plant community they can change its structure and species composition. This has a flow-on effect to native fauna and water resources.

There are over 500 species of naturalised exotic weeds (i.e. species from outside Australia) in the ACT. The composition and abundance of weeds is influenced by previous and current land use and land management practices. Some weed species have been intentionally introduced as ornamental species; others as pasture grasses in grazing areas.

Some of these species have become environmental weeds - that is, plants that represent a threat to the conservation values of natural ecosystems. The level of environmental impact associated with an environmental weed depends on its ability to invade and change the diversity and balance of a vegetation community. African Lovegrass (*Eragrostis curvula*) is an example that has established along the Murrumbidgee and Molonglo rivers, not as a direct result of development. In those valleys it forms dense swards, and out-competes native vegetation for space, nutrients and sunlight, changing the habitat characteristics that formerly suited native plants and animals.

Weeds reduce the productivity of agricultural lands, and some weeds, such as St Johns Wort (*Hypericum perforatum*) and Paterson's Curse (*Echium plantagineum*), are toxic to stock. The main pathways for weed-spread include transported livestock and fodder, contaminated crop and pasture seeds, deliberate introductions of new species, and the movement of contaminated machinery such as harvesters, recreational vehicles, cars, and mowers or slashers used in the maintenance of lawns and grassland areas.

Currently 78 weed species are declared pest plants in the ACT. Increasing development in the ACT is exacerbating the impact of weeds across all ecosystems in the ACT, particularly in locations with threatened or endangered species.

Land infested with weeds is a source of infestation for other areas. The risk of infestation is greatest where the boundaries of developed areas adjoin native vegetation. The weed species considered to be the greatest potential threat to the ACT will depend on the location and situation. A candidate for greatest potential threat is African Lovegrass in the Murrumbidgee River Corridor and surrounding areas. Understanding the specific impacts of weeds on various native plant species and communities will assist to improve management options.

The status of weeds is further discussed in the *Threatening processes* indicator cluster paper.

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Response indicators

Threatened species conservation

Conservation of threatened plant species in the ACT is an important part of protecting biodiversity and maintaining healthy ecological communities. The capacity of a human community to maintain threatened plant species in a landscape largely depends on eliminating or mitigating urban development, weed invasion, pests and disease, fire and climate change. For more information on strategic conservation management, including the management of protected areas, see the *Ecological communities* and *Threatening processes* indicator cluster papers.

The ACT Nature Conservation Act requires an Action Plan to be prepared in response to each declaration of a threatened species. Action Plans outline conservation and protection proposals for threatened plants, along with actions to minimise the effect of threatening processes. The details of Action Plans for the 8 threatened plant species under the Act, and details of national Recovery Plans for the 12 EPBC Act listed threatened plants of the ACT are summarised in Table 2.

Table 2. Action Plans and Recovery Plans for listed plants

Threatened species	Action Plans prepared under Nature Conservation Act	Recovery Plans prepared under EPBC Act
Canberra Spider Orchid (<i>Arachnorchis actensis</i> Syn. <i>Caladenia actensis</i>)	No ACT Action Plan has been produced. A National Recovery Plan has been prepared for this species and published and adopted under the EPBC Act.	A National Recovery plan was prepared in 2010. The duration of the Recovery Plan is for a period of 5 years (2010-2015).
Brindabella Midge Orchid (<i>Corunastylis ectopa</i>)	No ACT Action Plan has been produced. A National Recovery Plan has been prepared and published and adopted under the EPBC Act.	A National Recovery plan was prepared in 2010. The duration of the Recovery Plan is for a period of 5 years (2010-2015).
A subalpine herb (<i>Gentiana baeuerlenii</i>)	<i>Action Plan No. 5 (A subalpine herb Gentiana baeuerlenii) 2007.</i> Action Plan to be reviewed 3 years after commencement (April 2010).	A National Recovery plan was prepared in 2005 (based on Action Plan No. 5 prepared under the Act). That Action Plan was reviewed in August 2011.
Ginninderra Peppergrass (<i>Lepidium ginninderrense</i>)	Included in <i>Action Plan No. 28 (ACT Lowland Native Grassland Conservation Strategy) 2005.</i> Action Plan to be reviewed in 2010.	A National Recovery plan was prepared in 2005 (based on Action Plan No. 25 prepared under the Act). The duration of the Recovery Plan is for a period of 3 years (June 2008).
Tuggeranong Lignum (<i>Muehlenbeckia tuggeranong</i>)	Included in <i>Action Plan No. 29 (ACT Aquatic Species and Riparian Zone Conservation Strategy) 2007.</i> Action Plan to be reviewed in 2010.	A National Recovery plan was prepared in 2005 (based on Action Plan No. 24 prepared under the Act). The duration of the Recovery Plan is

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Threatened species	Action Plans prepared under Nature Conservation Act	Recovery Plans prepared under EPBC Act
		for a period of 3 years (June 2008).
Leek Orchid (<i>Prasophyllum petilum</i>)	Included in <i>Action Plan No. 27 (ACT Lowland Woodland Conservation Strategy) 2004</i> . Action Plan to be reviewed in 2009.	A National Recovery plan was prepared in 2010. The duration of the recovery Plan is for a period of 5 years (2010-2015).
Button Wrinklewort (<i>Rutidosis leptorhynchoides</i>)	Included in <i>Action Plan No. 28 (ACT Lowland Native Grassland Conservation Strategy) 2005</i> . Action Plan to be reviewed in 2010.	A Recovery Plan is currently being prepared.
Small Purple Pea (<i>Swainsona recta</i>)	Included in <i>Action Plan No. 27 (ACT Lowland Woodland Conservation Strategy) 2004</i> . Action Plan to be reviewed in 2009.	A Recovery Plan is currently being prepared.
Small Snake Orchid (<i>Diuris pedunculata</i>)	N/A	A Recovery Plan is currently being prepared.
Hoary Sunray (<i>Leucochrysum albicans</i> var. <i>Tricolor</i>)	N/A	A Recovery Plan is currently being prepared.
Pale Pomaderris (<i>Pomaderris pallida</i>)	N/A	No Recovery Plan
Austral Toadflax (<i>Thesium australe</i>)	N/A	A Recovery Plan is currently being prepared.

Source: ACT Government 2008, 2010a, 2010b, DSEWPaC 2009

ACT Action Plans have been prepared for 6 of the 8 threatened plant species. The Canberra Spider Orchid and Brindabella Midge Orchid are managed under a National Recovery Plan.

Actions Plans need to be continually reviewed and updated to ensure that the species' current status is understood (i.e. vulnerable, endangered or critically endangered). Implementation reports on each Action Plan are considered by the Flora and Fauna Committee every 3 years. Reviews of the Action Plans should be made publicly available.

During the reporting period, the ACT Government has undertaken monitoring, planting and surveying projects for threatened plants listed under the Act. All plant species listed under the Act are monitored annually and recovery actions continue to be implemented by the ACT Government. A summary of the status of each species, and the management actions undertaken in the reporting period, is provided below.

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Canberra Spider Orchid - Arachnorchis actensis

Management actions undertaken have included fencing the 3 main populations to reduce impacts of kangaroos and rabbits on the orchid. Relatively large clumps of the plants were protected with herbivore-proof cages to reduce grazing and increase seed set. Fewer than 5% of caged plants were grazed, compared to more than 50% of non-caged plants.

Brindabella Midge Orchid - Corunastylis ectopa

Little is known about this species in relation to its ecology and preferred habitat. As such, active adaptive management will be needed for the future management of this population (CPR 2010). Management of vegetation may be required, to maintain an appropriate habitat structure. The population is extremely small and isolated, and the threatening processes include expansion of nearby infrastructure and habitat change.

A subalpine herb - Gentiana baeuerlenii

The last known site where this herb was seen is now fenced to reduce rabbit grazing and pig rooting, but kangaroos still graze the site. Implementation of a burn is being considered, with the aim of removing the thick grass thatch to assist germination of any remaining seed.

Ginninderra Peppergrass - Lepidium ginninderrense

The ACT Government has provided funding to the Australian National Botanic Gardens for a seed collection and storage project with the aim of propagating plants for the establishment of a second population (CPR 2010). This would reduce the stochastic environmental risks to this species.

Tuggeranong Lignum - Muehlenbeckia tuggeranong

ACT Government staff and Southern ACT Catchment Group Landcare staff participated in the planting of cuttings of male and female plants in five suitable areas along the eastern bank of the Murrumbidgee River within the Pine Island Reserve, to increase the population at the site. The Conservation Planning and Research team made a thorough survey of the plantings in the summer of 2010-11, alongside the annual survey of the remnant population during spring 2011. There are 10 known wild plants, all of which were healthy when inspected in 2011. Of the 93 planted clones, approximately 50% were alive when inspected in 2011.

Leek Orchid - Prasophyllum petilum

The current management plan and monitoring program for this species at the Hall cemetery appears to be effective in maintaining the population. However, surveys have shown a decrease in the recruitment of new flowering plants since 2007. If recruitment continues to fall, management procedures will need to be reviewed and more detailed monitoring applied, to identify possible causes (Cook 2010).

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The continued operation of the area as a cemetery is a threat to this species. Management requirements for grave digging, vehicle access and movement, weed control and mowing are outlined in the Hall Cemetery Management Plan that was developed in 2005. The fragile nature of this small population means that in-situ conservation and monitoring of the Hall Cemetery population is crucial for the survival of the species in the ACT. Management of the Hall Cemetery, including proposed expansions, should be consistent with the conservation of threatened communities and species, in particular the Leek Orchid.

Button Wrinklewort - Rutidosia leptorrhynchoides

All known sites were inspected in 2009-10; threats at each site were identified and the information was provided to the relevant land managers. As a result, extensive woody weed control has occurred at the Stirling Ridge and State Circle sites (CPR 2010).

Small Purple Pea - Swainsona recta

Abundance records indicate that the population at Mount Taylor is stable, with numbers steadily increasing since plants were first tagged in 2001. Surveys have revealed that the populations at the other 4 locations have remained steady, but no new plants have been identified since 2003. The lack of recruitment of *Swainsona recta* could be attributed to dense native shrub and grass cover which is potentially out-competing this threatened species. The survey will be repeated at the same time in 2011 and site inspections will be carried out. Management actions that would potentially assist recruitment of the species, such as the controlled burning of dense native grass growth, will be implemented (Cook 2010).

Monitoring of non-threatened species

In addition to the monitoring and recovery actions undertaken for species and communities in the ACT listed as threatened under ACT or Commonwealth legislation, the ACT Government monitors non-listed species if their conservation status is of concern. Two non-listed plant species currently being monitored include the riparian shrub *Bossiaea grayi* and a small perennial sub-shrub *Dampiera fusca*.

Bossiaea grayi

A nomination of *Bossiaea grayi* as a threatened (either vulnerable or endangered) species is currently under assessment. This species is only known to exist in the ACT; it has been recorded in several locations in the riparian zone of the Murrumbidgee River and its tributaries within the ACT. To clarify the condition, extent and number of plants, site assessments of new and known locations were undertaken by CPR in May and June 2010.

During the 2010 surveys between 200 and 300 individual *Bossiaea grayi* plants were observed at the known locations. In addition the species was observed at a number of new localities, including a site with over 200 plants in the Paddys River area. At two sites where plants have previously been recorded, no plants were found during

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this survey (CPR 2010). Systematic surveys should be considered for all areas of suitable habitat in the ACT to establish the full extent, the status and condition of populations of *Bossiaea grayi* across the ACT.

Dampiera fusca

Dampiera fusca is a small perennial sub-shrub found in the ACT after the 2003 fire, this being the first time this genus had been recorded in the ACT. In 2007 a quantitative monitoring program of the known population of the species was established. The *Dampiera fusca* population flowered rapidly and profusely after the 2003 fire, then declined as a result of increased competition from other plants for light and resources. The population increased in 2009, perhaps because of favourable seasonal conditions. Further monitoring will be undertaken to establish how long this species remains detectable following fire.

Rabbit and wombat scats were observed across the area occupied by *D. fusca*, and some grazing was observed on the adjacent native grasses. The threat of grazing by mammals is not regarded as a major threat to this species, but the issue of rabbit control is likely to require management (CPR 2010).

Seed collection policy

In 2010, the Conservator of Flora and Fauna endorsed an interim policy for limited commercial seed collection, addressing a recommendation in the *2007-08 State of the Environment Report*.

Collection of native seed from wild populations is constrained by legislation and licensing. Consideration of commercial seed collection policy or legislation is included in the scope of the review of the Nature Conservation Act 1980. The interim policy outlines policies for seed collection on unleased areas including reserves, roadsides and urban parks. This will benefit conservation community groups and commercial seed collectors that wish to provide for large amounts of seed for revegetation projects, and it will facilitate an increase in the number of revegetation projects using local native species.

Specific rehabilitation guidelines should be developed to complement the interim policy on seed collection. Such guidelines would assist conservation groups and land holders in identifying the most suitable areas in the landscape to be targeted for rehabilitation works. Updating the interim policy and relevant guidelines (e.g. revegetation guidelines) would be appropriate following outcomes from the review of the Nature Conservation Act.

Greening Australia has identified that there is a demand for collecting native seed within the ACT by a number of regionally based non-government conservation community groups and commercial seed collectors. They have developed guidelines for collecting seed for use in revegetation in the ACT and surrounding regions. The guidelines outline principles for areas of high, moderate, low and minimal conservation in the ACT, and provide soil and vegetation community maps to help guide where seed should be sourced.

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Currently Greening Australia, supported by the ACT NRM, is coordinating the development of a community seed bank to manage collections of native seed, its processing, and storage. They also maintain records of seed held and they manage a supply of local provenance seed for revegetation projects in the ACT region.

Following the 2003 bushfire in the ACT, the Seeds for Survival project was initiated to increase the availability and diversity of local native seed in the ACT (Australian Government 2008). This project is a partnership between the Australian National Botanic Gardens, CSIRO Plant Industry, ACT Government, and Greening Australia. A total 238 kg of seed representing 170 species had been collected by June 2008 and approximately 100 kg of native seed has been collected since 2009. Most of this supply has been used in direct seeding activities across the ACT.

Community engagement

Volunteers from organisations such as Parkcare, Landcare and Greening Australia are active in monitoring biodiversity in ACT nature reserves.

Each year the ACT Government provides ACT Environment Grants for projects that support community engagement in relation to implementing nature conservation strategies. During the reporting period, none of the funded projects has supported threatened plant species conservation or review of existing Action Plans (ESDD 2011). However, a number of projects have been funded to enhance native vegetation, including:

- Scrivener Hill Lookout - environmental repair of Scrivener Hill (O'Malley) through training of volunteers in vegetation monitoring techniques by Greening Australia;
- ACT Community Weed Control Assistance - strategic weed control assistance to ACT rural landholders and community Landcare through training and a weed spray trailer managed by Southern ACT Catchment Group;
- Crace Grassland Restoration: Consolidation and Care - consolidation and maintenance of grasslands rehabilitated by the Belconnen Model Aero Club;
- Restoring Native Grasses to the Understorey of The Pinnacle - a research project studying soil nutrient levels for the improved restoration of the Yellow Box-Red Gum Grassy Woodlands formation, by Ginninderra Catchment Group.

For more information on the role of community groups in conservation see the *Community engagement* indicator cluster in the *People* theme.

Glossary

Stochastic: A process where behaviour or outcomes are random

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Other data sources

In addition to these published reports, data for this paper were also sourced from:

ACT Department of Territory and Municipal Service (TAMS) now Territory and Municipal Service Directorate (TAMSD)

ACT Department of the Environment, Climate Change Energy and Water (DECCEW) – now Environment and Sustainable Development Directorate (ESDD)

Greening Australia