

Threatened Species Management Plan

March 2010



Canberra Airport takes its environmental responsibilities seriously. Given this it will do all that it is reasonable and practicable in the circumstances to ensure it and its employees, officers, agents, and contractors comply with this strategy.

Canberra Airport has taken expert advice from Peter Robertson, Wildlife Profiles Pty Ltd and co-author of the Grassland Earless Dragon Recovery Plan, Alison Rowell, Qualified Ecologist and University of Canberra, Institute of Applied Ecology.

Canberra Airport has also consulted with the Department of Defence, ACT Commissioner for Sustainability and the Environment, Friends of Grasslands, Conservation Council - ACT Region, ACT Department of Environment, Climate Change, Energy & Water, Limestone Plains Group and peak community groups (ACT and NSW) regarding the EPBC Act referrals and listed threatened species on Airport.

Issues relating to the northern road, the Northern Road Strategy (Construction and Operation) and Conservation Agreement will be formally submitted to the Department of the Environment, Water, Heritage and the Arts for approval in the event that the land is transferred to Canberra Airport for the purpose of constructing the northern road.

This Threatened Species Management Plan was approved by the Minister for Environmental Protection, Heritage and the Arts on 9 March 2010, as a condition to EPBC Act Referral 2009/4748 for the Infrastructure upgrade and Construction at Canberra Airport.

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Chapter one | Introduction



Canberra Airport is a major public transport gateway to the Nation's Capital. The Airport is located in the south west corner of the Majura Valley, and makes up a small but important part of the Majura Valley Grassland community.

Prior to Airport operations commencing at Majura in 1927, the land formed part of the Limestone (treeless) Plains which was comprised mainly of Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory (NTG), which is listed as endangered under the *Environment Protection and Biodiversity Conservation Act* (EPBC Act), and supports listed threatened species.

The Commonwealth progressively developed the site as a commercial airfield and RAAF Base. The initial construction in the 1930s and subsequent maintenance and expansion of the Airport's runways and taxiway systems has involved significant landplaning, re-grading of contours and alterations to hydrology.

Disturbed areas have naturally regenerated over time to its present condition which has been assessed as Botanical Significance Rating 3 or patches of moderately-modified NTG and exotic and native pasture (ACT Government, 2005).

The ACT Commissioner for Sustainability and the Environment acknowledged the overall effective management of NTG by Canberra Airport in the 2009 Report on the Lowland Native Grassland Investigation (ACT Commissioner for Sustainability and the Environment, 2009).

This Threatened Species Management Plan updates the 2004 Grassland Management Plan to reflect the proposed construction of new and the ongoing maintenance of Airport infrastructure, as identified in the Canberra Airport 2009 Master Plan and referral approvals with conditions.

This Threatened Species Management Plan has also been developed to provide employees of Canberra Airport and the wider community with a better understanding of NTG and listed threatened species on Airport and how they are managed in response to contemporary research and practices.

The plan may be amended, from time to time, in consultation with the Department of the Environment, Water, Heritage and the Arts to evolve in response to new experience and knowledge.

Chapter two | Master Plan Project



Canberra Airport has a responsibility to the Airlines, aviation business and the community to ensure that infrastructure including the construction and widening of runways, taxiways and aprons is in place to meet aviation demand and ensure the safety, efficiency and regularity of aviation and other traffic on and around the Airport.

In 2003/04 the Airport undertook extensive consultation and obtained approval on a Major Development Plan (MDP) for Runway and Taxiway upgrades, including a 600m extension to the main runway 17/35 and a full runway strengthening program.

EPBC approval 2008/4170 (with conditions) was granted in December 2008 for the construction of the northern section of Taxiway Bravo as shown in Figure 1, which complements the MDP approval.

In February 2009, the *Infrastructure upgrade and construction at Canberra Airport EPBC 2009/4748* referral was submitted in response to the EPBC 2007/3756 referral approval conditions and the Canberra Airport 2009 Master Plan as shown in Figure 1.

The proposals covered in the referral include:

- Extension of the Fairbairn apron;
- Construction of Taxiway Alpha aviation facilities;
- Realignment and widening of Taxiway Alpha to meet relevant standards;
- Widening and strengthening of Taxiways Charlie and Juliet;
- Construction of a new Air Traffic Control Tower;
- Upgrades to tarmacs in all precincts;
- Relocation of Runway 35 threshold;
- Turning node on Runway 17/35;
- New link taxiways to Runway 17/35;
- Relocation of General Aviation area;
- Expansion of freight facilities;
- Upgrading of lighting, including new High Intensity Approach Lighting (HIAL) to Runway 17;
- GPS Ground Station;

- Provision for Runway Visual Range (RVR) instruments and other infrastructure required for improved precision navigation;
- Upgrading of the aerodrome to Category II and III ILS/GPS on Runways 17/35;
- Upgraded airfield lighting;
- Relocation of Instrument Landing System (ILS);
- Construction of a northern road (currently on Defence land yet to be transferred to Canberra Airport ownership);
- Upgrading of the airside roads; and
- Provision of buffers to ensure ongoing maintenance of airfield and aviation.

The ongoing maintenance of infrastructure and buildings, the sealing and otherwise upgrading of airside roads and

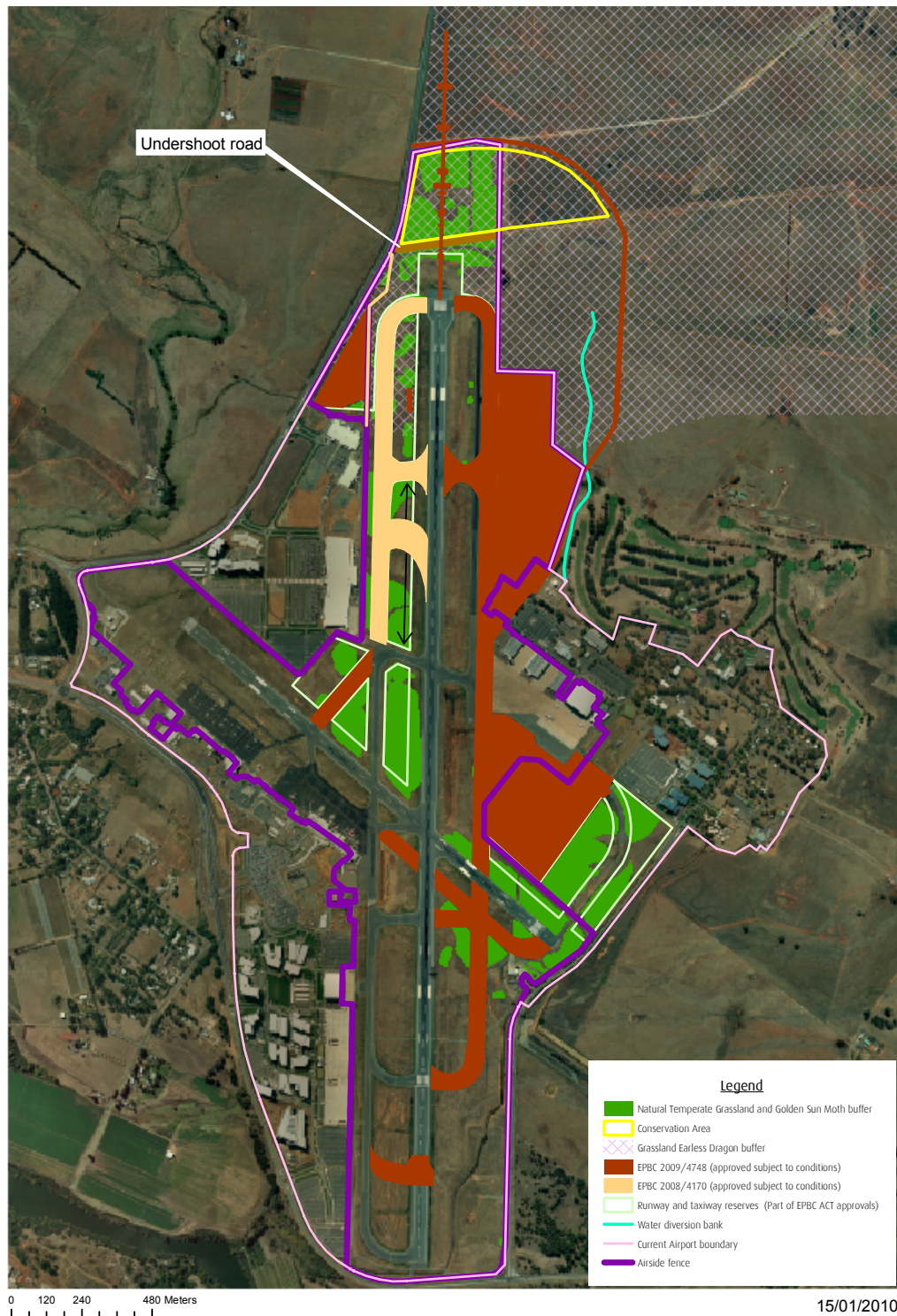
the provision of new roads associated with the extension of taxiways and runways is required to ensure compliance with security and emergency requirements.

The following road and corridor reserves are consistent with the 2004 Grassland Management Plan:

- 10m road corridor
- 4m from the building
- 60m taxiway corridor
- 90m cross runway 12/30 corridor
- 150m main runway 17/35 corridor

Conduits and pipes are laid in the road and corridor reserves wherever possible to minimise disturbance to grassland and listed threatened species.

Figure 1:
Environment Protection and Biodiversity Conservation Act Referrals



Chapter three | Legislative Requirements



The key pieces of legislation controlling the environmental operations of the Airport are the *Airports Act 1996*, *Airports (Environment Protection) Regulations 1997* and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

3.1. Airports Act 1996

The *Airports Act 1996* requires the operator of an airport to prepare an Airport Master Plan and Environment Strategy every five years.

This Threatened Species Management Plan complements the 2009 approved Master Plan, 2010 Environment Strategy and 2004 Grassland Management Plan and provides further information on the management of listed threatened species on Airport.

The 2004 Grassland Management Plan was a condition of approval for the Major Development Plan for Runway and Taxiway Expansion Program by the then Minister for Transport and Regional Services.

3.2. Airport (Environment Protection) Regulations 1997

The *Airport (Environment Protection) Regulations 1997* requires the development and adoption of a comprehensive environmental management system.

Environmental management at the Airport is the responsibility of Canberra Airport. The delegation of responsibility is shown in Figure 2 on the following page.

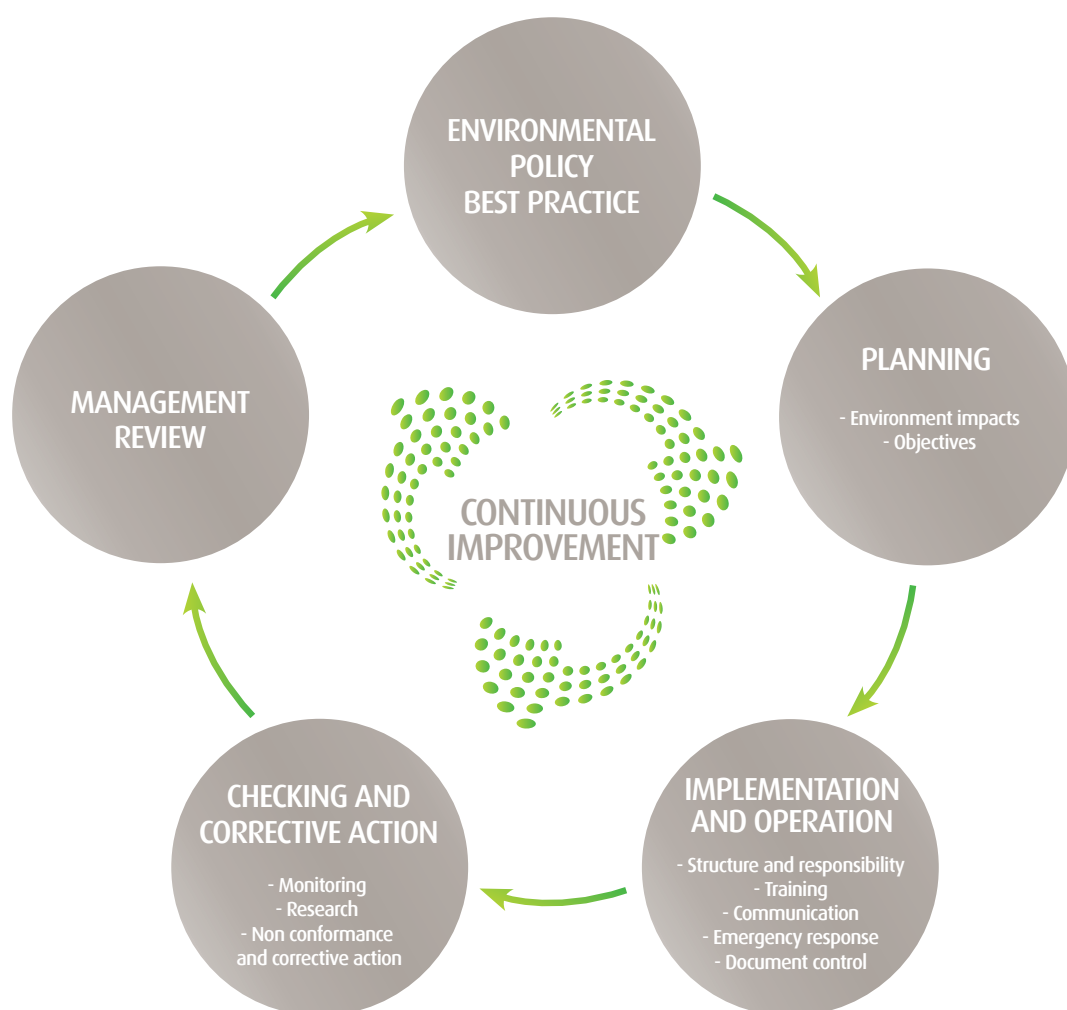
The environmental management framework at Canberra Airport is based on a system of continuous learning and improvement as shown in Figure 3.

Individual components of the environmental management framework are updated as required to ensure consistency with regulations and evolving best practice standards.

Figure 2:
Structure and responsibility at Canberra Airport



Figure 3
Environment Management System – Continuous Improvement



3.3. Environmental Protection Biodiversity Act

Two referral approvals under the EPBC Act have been obtained. These approvals with conditions include the:

- *Taxiway Bravo and associated works EPBC 2007/4170* referral (approved with conditions on 10 December 2008); and
- *Infrastructure upgrade and construction at Canberra Airport EPBC 2009/4748* referral, in response to the *Transfer of Defence Land at Majura, ACT EPBC 2007/3756* referral and the Canberra Airport 2009 approved Master Plan, (approved with conditions on 11 November 2009)

The Airport has prepared a number of documents, including this Threatened Species Management Plan, in response to these referral conditions of approval under the EPBC Act. These documents have been reviewed and have been approved by the Department of the Environment, Water, Heritage and the Arts.

The Northern Road Strategy (Construction and Operation) and Conservation Agreement which are conditions of approval for the EPBC 2009/4748 referral will be formally submitted to the Department of the Environment, Water, Heritage and the Arts for approval in the event that the land is transferred to Canberra Airport for the purpose of constructing the northern road.

Table 1: Condition of referral approvals

CONDITION OF REFERRAL APPROVAL EPBC	DOCUMENTS	APPROVAL DATE
2009/4748	Threatened Species Management Plan	9/3/2010
2009/4748	Master Plan Offset Strategy	9/2/2010
2009/4170	Taxiway Bravo Biodiversity Offset Strategy	2/2/2010
2009/4170 & 2009/4748	Standard Construction Environment Management Plan	3/2/2010

3.3.1. Threatened Species Management Plan

This Threatened Species Management Plan includes measures to manage NTG and listed threatened species on Airport including:

- Monitoring and mapping;
- Weed control;
- Mowing heights and regimes;
- Rehabilitation and revegetation;
- Drainage;
- Monitoring regimes and surveys;
- Thresholds for triggering further management interventions;
- Environmentally significant areas and their protection; and
- Results of research and details of any current and future research proposals.

Conditions are referenced throughout this plan as “In response to referral EPBC 2009/4748, approval condition 2.”

3.3.2. Biodiversity Offset Strategy

Offset Strategies are required as conditions of the referral approvals for the *Taxiway Bravo and associated works EPBC 2007/4170* and *Infrastructure upgrade and construction at Canberra Airport EPBC 2009/4748* referrals.

The Taxiway Bravo Biodiversity Offset Strategy includes:

- Methods for rehabilitation;
- Timeframes for the implementation of the Strategy;
- Ongoing monitoring and evaluation; and
- Details and outcomes of research funding.

The Master Plan Offset Strategy includes:

- Details of the acquisition and protection in perpetuity of land containing NTG; and
- Details of future ownership and management of the land to be used as the offset.

The main objective of the Offset Strategies is to fulfill the conditions of the referral approval conditions and to compensate for areas of NTG removed as a result of the proposed actions and the benefits of the offsets to the affected listed threatened species and ecological community.

The implementation of the Offset Strategy will also provide valuable information for the rehabilitation and conservation of NTG and listed threatened species.

3.3.3. Conservation Agreement

A Conservation Agreement between the Department of Environment, Water, Heritage and the Arts and Canberra Airport is to be formally submitted and finalised, in the event that the land is incorporated into the Canberra Airport lease, in response to the referral approval conditions for the *Transfer of Defence Land at Majura, ACT EPBC 2007/3756* referral.

In addition, NTG and listed threatened species to the north of the undershoot road is to be placed in the Conservation Agreement as part of the offset for the *Infrastructure upgrade and construction at Canberra Airport EPBC 2009/4748* referral. Refer to Figure 1.

This Conservation Area was identified by Canberra Airport in the referral and Preliminary Documentation for EPBC 2009/4748 as being beneficial for the long term viability of natural temperate grassland and listed threatened species on Airport.

3.3.4. Construction Environment Management Plan

The Standard Construction Environment Management Plan (CEMP) for Airside works comprises the following:

- Measures to reduce indirect construction impacts on NTG;
- Measures to reduce impacts on listed threatened species;
- Management of NTG adjacent to the construction area to improve the quality of the grassland;
- Measures to incorporate environmental considerations into the construction of proposed developments; and
- Indicative environmental management checklists to assist with monitoring the implementation of

environmental management obligations during construction works.

The CEMP fulfils the requirements of the *Airport (Environment Protection) Regulations 1997* and *Environmental Management Systems: Guidelines (NSW Government, 1998)*, and is consistent with the aims and practices required under the Green Building Council of Australia, Green Star Certification scheme.

The CEMP, in conjunction with the project specific Erosion and Sediment Control Plan provided by the contractor, forms the basis of environmental management during the planning and construction of the project.

3.3.5. Northern Road Strategy (Construction and Operation)

The Northern Road Strategy (Construction and Operation) is required as a condition of approval for the *Infrastructure upgrade and construction at Canberra Airport EPBC 2009/4748* referral.

The purpose of the Northern Road Strategy (Construction and Operation) is to demonstrate:

- No net loss of habitat for the Grassland Earless Dragon;
- No fragmentation of Grassland Earless Dragon habitat;
- No net impact on Grassland Earless Dragons from construction activities; and
- No increase to the risk of extinction for the east Majura Valley Grassland Earless Dragon population.

The Strategy will include a population viability analysis (PVA) that will be peer reviewed by a suitably qualified expert, familiar with the Grassland Earless Dragon, and agreed to by the Minister.

The Northern Road Strategy (Construction and Operation) will be formally submitted and finalised, in the event that the land is incorporated into the Canberra Airport lease, in response to the referral approval conditions for the *Infrastructure upgrade and construction at Canberra Airport EPBC 2009/4748* referral.

Chapter four | Environmentally Significant Areas



The Airport's Preliminary Draft 2010 Environment Strategy identifies the proposed Conservation Area as an Environmentally Significant Area and the balance of NTG and potential habitat for listed threatened species on Airport (excluding approved development under the EPBC Act) as Environmentally Sensitive Areas, refer to Figure 1.

The following sections are in response to referral EPBC 2009/4748, approval condition 2:

- f) Monitoring regimes and survey methods; and
- h) Environmentally Significant areas and their protection.

4.1. Natural Temperate Grassland

NTG is listed as an endangered ecological community under the EPBC Act and has a current National Recovery Plan and ACT Action Plan in force. The grasslands are habitat for vulnerable and endangered fauna such as the Grassland Earless Dragon and Golden Sun Moth.

The Department of the Environment, Water, Heritage and the Arts (DEWHA) broadly defines the NTG community as generally treeless or containing up to 10% cover of trees, shrubs or sedges.

The community is dominated by moderately tall (25-50cm) to tall (50-100cm) open tussock grasses with up to 70% of all plant species comprised of forbs.

The composition of NTG includes native grasses such as Wallaby Grass (*Austrodanthonia*), Speargrasses (*Austrostipa*), Redleg Grass (*Bothriochloa*), Tussock Grasses (*Poa*) and Kangaroo Grass (*Themeda*) and over 700 native herbs including sedges, rushes, orchids, lilies and forbs (*Environment ACT, 2005*).

The cryptogamic crust formed by layers of lichens and mosses is also present and plays an important role in seed germination and stabilizing inter-tussock spaces.

The Airport was re-mapped in 2008/2009 bringing the Airport mapping into line with standards used in the ACT and NSW. This mapping is shown in Figure 1 and excludes the approved referral areas (EPBC 2007/4170 and EPBC 2009/4748).



4.2. Grassland Earless Dragon

The Grassland Earless Dragon (*Tympanocryptis pinguicolla*) is listed as endangered under the EPBC Act.

Grassland Earless Dragon is a small cryptic lizard measuring approximately 150mm, from the snout to the tip of the tail and lacks an external ear opening and functional ear drum. Grassland Earless Dragons have individually distinct brown patterns on their backs that can be used to identify individuals, with some individuals also having yellow throats and pink pelvic regions.

Grassland Earless Dragons prefer NTG that have inter-tussock spaces and burrows constructed by Wolf Spiders (*Lycosa spp.*) and the Canberra Raspy Cricket (*Cooraboorama canberrae*).

Grassland Earless Dragon lifespan is assumed to be between 1 and 3 years in the wild and its diet includes a variety of insects including ants, beetles and moths.

Grassland Earless Dragons were first recorded at the Airport in 1996 and subsequent monitoring and capture has confirmed their presence east of the main runway and north of Taxiway Foxtrot.

On Airport, Grassland Earless Dragons have been recorded in well-drained, minimally disturbed NTG, dominated by Wallaby Grasses, Speargrasses and Kangaroo Grass.

Grassland Earless Dragons surveys are undertaken biennially and currently more frequently to coincide with the University of Canberra Grassland Earless Dragon Post Doctorate Research Project.

Canberra Airport has erected a ceramic mural of the Grassland Earless Dragon in Brindabella Business Park. The mural located in the foyer increases the awareness of the Grassland Earless Dragon to Airport staff, tenants and visitors.

4.3. Golden Sun Moth

The Golden Sun Moth (*Synemon plana*) is listed as critically endangered under the EPBC Act.

The male Golden Sun Moth has an average wingspan of 3.4cm and is dull in colour. Their forewings are dark brown with pale grey patterns and hind wings are brown with darker brown patches.

The female Golden Sun Moth is smaller and has an average wingspan of 3cm and is much brighter in colour. Their forewings have grey and brown patterns and hind wings are golden brown colour with dark patches of brown. The female sits in the tussock grasses as she is generally flightless, due to her smaller wings, and attracts the flying males with her golden hind wings.

The Golden Sun Moth gets its name from golden hind wings of the female and the fact that they are diurnal, meaning they fly during the day.

Golden Sun Moths prefer calm clear conditions and avoid flying in high winds.

The Golden Sun Moth larva is presumed to feed on the roots of native grasses. The length of the larval stage is unknown, but may be one to three years.

As adults, they cannot feed as they do not have functional mouthparts and can only live for two to five days. The Golden Sun Moth is sometimes referred to as the "Mouthless Mouth".

Golden Sun Moth surveys at the Airport are carried out biennially between mid October and early January when the male Golden Sun Moth is actively searching for females.

They usually fly between 10:00am and 2:00pm and prefer full sun, no rain or cloud and low winds. The female Golden Sun Moth rarely flies, it prefers to walk between the tussocks.

4.4. Perunga Grasshopper

The Perunga Grasshopper (*Perunga ochracea*) is listed as vulnerable under the ACT Nature Conservation Act 1980.

The Perunga Grasshopper is short winged and flightless. They are distinguished from other grasshoppers by the "X" on their pronotum. Adult females are between 26-35mm in length and adult males are 15-20mm in length. Adults may be brown buff or green.

Perunga Grasshoppers are found in NTG and feed on forbs. The Perunga Grasshopper has an unusual lifecycle with nymphs hatching in late summer and autumn and maturing over the winter and early spring.

The species has rarely been recorded at the Airport, despite many grassland surveys carried out during their activity period.

Perunga Grasshoppers are difficult to find unless they are startled, when they jump once or twice before hiding in the grass tussocks which they also use for shelter. The Perunga Grasshoppers are difficult to catch as they are able to jump distances of over a metre.

The Perunga Grasshopper is monitored on Airport by indirect searching as part of other grassland surveys. This includes regular Golden Sun Moth surveys and vegetation monitoring, during which consultants spend many hours annually in the habitat.

4.5. Striped Legless Lizard

Striped Legless Lizard (*Delmar impar*) is listed as vulnerable under the EPBC Act.

Striped Legless Lizard grows to about 300mm in length and weighs about 8g. Usually they have a series of dark lateral stripes along the length of the body. However, some individuals, particularly juveniles, stripes may be absent or faint.

Striped Legless Lizard is a grassland specialist and feeds on a variety of arthropods including spiders, crickets, cockroaches and caterpillars.

The Striped Legless Lizard has not been recorded on Airport, although it is known to occur on Defence land to the north.

Extensive pitfall trapping at the Airport in 1996 by ACT government did not find the species, and it was concluded that the Airport does not provide suitable habitat for the species, probably due to the effect of long-term frequent low mowing on the tussock structure (*Environment ACT 1997*).

An initial assessment for Striped Legless Lizard in West Malcomvale will be undertaken as part of the assessment for the site.

Chapter five | Potential Impacts



The implementation of the *Taxiway Bravo and associated works EPBC 2007/4170* and *Infrastructure and construction at Canberra Airport EPBC 2009/4748* referrals will result in the removal of NTG and potential habitat for listed threatened species.

Other potential impacts, on NTG and potential listed threatened habitat, from construction include:

- Soil disturbance;
- Soil compaction;
- Weed dispersal;
- Changes in hydrology;
- Runoff from construction site;
- Spoil and debris dispersal; and
- Disturbance to listed threatened species habitat.

The potential impacts from construction have been addressed in the Standard Construction Environment Management Plan and in Section 7.0 Management Actions.

Chapter six | Management Plan Strategies

This Threatened Species Management Plan updates and expands upon the 2004 Grassland Management Plan objectives of managing, improving and expanding NTG and listed threatened species on Airport (that are not affected

by development as approved with conditions under the EPBC Act).

The strategy and actions of this Threatened Species Management Plan are set out in Table 2 below.

Table 2: Threatened Species Management Plan Objectives and Strategies

OBJECTIVE	STRATEGIES
Ongoing management of NTG and listed threatened species on Airport.	Continue to implement management actions as stated in Table 3.
	Implementation and ongoing review of the Standard Construction Environment Management Plan.
Ongoing development and implementation of mitigation protocols.	Ongoing development of the retrieval and short distance movement protocols for the Grassland Earless Dragon and Striped Legless Lizard.
	Ongoing staff training and awareness including tool box meetings prior and during construction.
	Investigate and implement methods to propagate forbs in areas of native pasture.
	Demonstrate seeding of native grasses in a commercial broad acre method.
Demonstrate improvement and expansion of existing NTG and listed threatened species habitat (excluding approved referral areas)	Investigate opportunities to rehabilitate the western portion of Malcomvale property.
	Installing artificial holes to encourage the repopulation of Grassland Earless Dragons on Airport.
	Conduct trials to increase grassland quality on Airport.
Implementation and compliance with EPBC Act referral approval conditions.	Implementation and reporting of referral approval conditions: <ul style="list-style-type: none">• Threatened Species Management Plan;• Standard Construction Environment Management Plan;• Taxiway Bravo Biodiversity Offset Strategy;• Conservation Agreement;• Master Plan Offset Strategy; and• Northern Road Strategy (Construction and Operation).

Monitoring	Biennial Grassland Earless Dragon surveys
	Biennial Golden Sun Moth Surveys
	Re-mapping of grassland on Airport in 2013
Increase the body of knowledge for NTG and listed threatened species.	Continue to provide funding to the University of Canberra Grassland Earless Dragon Post Doctorate Research Project
	Continue to provide support to the University of Canberra Golden Sun Moth Counter Program
	Share monitoring data and trial outcomes

Chapter seven | Management Actions

7.1. Ongoing Management Actions

Canberra Airport has specific management actions which have been progressively implemented by the Airport since privatisation in 1998 and have been successful in managing the grassland on Airport.

The following section is in response to referral EPBC 2009/4748, approval condition 2:

a) Monitoring and mapping;

b) Weed control;

c) Mowing heights and regimes;

e) Drainage; and

g) Thresholds for triggering further management intervention (see Performance Indicators)

Ongoing management actions undertaken at the Airport are outlined in Table 3.

Table 3: Ongoing Management Actions

OBJECTIVE	STRATEGIES	RESPONSIBILITY	TIMING
Management Measures	Targeted weed spraying in areas of high quality grassland and broader in other areas	Environment Officer	Annually
	Spot spraying not to be undertaken on windy days	Ground Staff	Annually
	Mowing machinery cleaned to minimise weed transfer	Mowing contractor	Annually
	Mowing from higher quality grassland to lower quality grasslands (where operationally practical)	Mowing contractor	Annually
	No change to mowing regime on Airport – current mowing height 10-12cm	Mowing contractor	Annually
	Mowing frequency dependent on seasonal conditions, i.e. drought, and bird mitigation procedures	Canberra Airport	Annually
	No application of superphosphate or use of subterranean clover Airside	Ground Staff	Annually
	Fertilisers and other soil ameliorants are not used Airside	Ground Staff	Annually
	Conduits to be/have been laid to minimise future soil disturbance	Canberra Airport	Ongoing
	Ensure integrity of fences and feral animal control i.e. deterring rabbit burrowing under airside fence.	Project Managers	Annually

Management Measures cont...	Fire not used to manage NTG on Airport	Ground Staff	Annually
	No trees to be planted Airside	Environment Officer	Annually
	Local provenance to be considered when purchasing and collecting grass seed for cultivation on Airport	Environment Officer	Annually
	Maintain existing stormwater detention basins and swale systems	Canberra Airport	Ongoing
	NTG and listed threatened species habitat to be considered when designing additional drainage management works	Canberra Airport	As required
Monitoring Regime	Grassland Earless Dragon surveys	Environment Officer	Biennial
	Golden Sun Moth Surveys	Environment Officer	Biennial
	Re-mapping of grassland on Airport	Environment Officer	2013
Performance Indicators	Improvement or no change in grassland and habitat quality	Canberra Airport	Annually
Corrective Actions	Additional weed control	Canberra Airport	When required
	Review of mowing regime	Canberra Airport	When required

7.2. Rehabilitation Management Actions

Demonstrate improvement and expansion of existing NTG on Airport by rehabilitating vegetation quality 4 and 5 (native pasture and exotic grasses) to meet the definition of NTG, in accordance with Condition 2a (ii) of EPBC 2008/4170 referral.

Rehabilitation works are to be undertaken inside the Airside fence (refer to Figure 1) in areas not likely to be affected by future development or airport operations.

The following section is in response to referral EPBC 2009/4748, approval condition 2:

d) Rehabilitation and revegetation.

The key issues relating to the rehabilitation include:

- Establishment of NTG at a ratio of 3ha for every 1ha to be removed;
- Developing weed control, optimum seed and watering application rates;
- Developing broad acre method for seeding; and
- Managing seasonal impacts.

Table 4: Rehabilitation Management Actions

OBJECTIVE	STRATEGIES	RESPONSIBILITY	TIMING
Management Measures	Identify rehabilitation areas of vegetation quality 4 and 5 within the Airport lease not likely to be affected by future development or airport operations.	Environment Officer & Ecologist	Year 1
	Collect, dry and store seed from Master Plan offset property and on-Airport harvesting	Ground Staff	Year 1-4
	Conduct experiment in identified rehabilitation areas to determine: - Weed control application rates; - Seed application rates; - Pre and post seeding watering rates; - Broad acre seeding methods; - Density and timing of spreading hay bearing seed; - Translocation methods; and - Collect, store and propagate forbs to be sown in areas of vegetation quality 4 and 5.	Environment Officer and Ground Staff	Year 1-2 Year 2-4
	Implement outcomes of experiment in areas of vegetation quality 4 and 5	Ground Staff	Year 2 - 4
	Replanting propagated forbs and replanting forbs collected from areas affected by development in areas of vegetation quality 4 and 5	Ground Staff	Year 2 - 4
	Maintain revegetation areas through watering, weed control and additional planting/seeding if required	Ground Staff	Year 2 - 5

Monitoring Regime	Monitor success of rehabilitation program	Environment Officer	Year 1 - 5
	Annual report to the Department of the Environment, Water, Heritage and the Arts	Environment Officer	Year 1 -5
	Grassland survey and mapping	Qualified Ecologist	Year 5
Performance Indicators	Establishment of 9.6 hectares of NTG in vegetation quality 4 and 5 in response to referral EPBC 2008/4170, approval condition 2	Environment Officer	Year 5
Corrective Actions	Additional weed control and watering	Environment Officer	Year 2 - 5
	Additional seeding and transplantation	Environment Officer	Year 2 - 5
	Purchase of additional offset land in response to referral EPBC 2008/4170, approval condition 2	Environment Officer	Year 2 - 5

Chapter eight | Training

Training is an important component in ensuring the implementation of this Threatened Species Management Plan and ensuring compliance with EPBC Act referral conditions. Table 5 below summarises the training schedule.

Personnel trained will include:

- Airport Management;
- Environment Officer;
- Airport Operation Officers;
- Ground Staff;
- Contractors; and
- Consultants.

Table 5: Training Schedule

OBJECTIVE	STRATEGIES	RESPONSIBILITY	TIMING
Management Measures	Implementation of ongoing management strategy including weed control and moving regime	Director of Planning and Environment Officer	Year 1-5
	Implementation of construction management strategy including identification of listed threatened species	Director of Planning and Environment Officer	Year 1-5
	Implementation of rehabilitation management strategy, including: <ul style="list-style-type: none">- Collection, drying and storage of grass and forb seeds;- Rehabilitation methods; and- Post rehabilitation maintenance	Director of Planning and Environment Officer	Year 1-5
Monitoring Regime	Comprehension and implementation of methods	Director of Planning	Year 1-5
Performance Indicators	Implementation of management strategies	Canberra Airport	Annually
	Improvement or no change in grassland and habitat	Director of Planning	Year 1-5
Corrective Actions	Additional training	Director of Planning	Year 1-5

Chapter nine | Adaptive Management

Adaptive management may be required for further mitigation measures to maintain NTG and listed threatened species habitat on Airport. Table 6 below provides criteria for action on Airport.

It should be noted that NTG and Grassland Earless Dragon and Golden Sun Moth habitat may be affected by future drought conditions or other variables outside the control of Canberra Airport.

Table 6: Adaptive Management Actions

VALUES	TRIGGERS	ACTIONS	RESPONSIBILITY	TIMING
NTG	An apparent decline in NTG quality and quantity (excluding development areas in Figure 1). Condition to be assessed by Botanical Significance Rating	<ul style="list-style-type: none"> Consult with qualified Ecologist and Recovery team Review management actions Implement recommendations 	Director of Planning	Five yearly (in accordance with Canberra Airport 2010 Environment Strategy)
Grassland Earless Dragon	An apparent decline in Grassland Earless Dragon abundance, distribution or habitat quality (excluding development areas in Figure 1) to be assessed as part of biennial Grassland Earless Dragon monitoring report	<ul style="list-style-type: none"> Consult with qualified Ecologist and Recovery team Review management actions Implement recommendations 	Director of Planning	Biennially (in accordance with Canberra Airport 2010 Environment Strategy)
Golden Sun Moth	An apparent decline in Golden Sun Moth abundance, distribution or habitat quality (excluding development areas in Figure 1) to be assessed as part of biennial Golden Sun Moth monitoring report	<ul style="list-style-type: none"> Consult with qualified Ecologist and Recovery team Review management actions Implement recommendations 	Director of Planning	Biennially (in accordance with Canberra Airport 2010 Environment Strategy)

Chapter ten | Reporting

Reporting is required to demonstrate compliance with referral conditions of approval and to inform government departments, University of Canberra and

Canberra Airport's Board of Directors of progress in threatened species management and research. Table 7 below summarises the reporting requirements.

Table 7: Reporting Schedule

REPORTING	DEPARTMENT/ORGANISATION
Translocation Report (Final report September 2010)	
Construction Environment Management Plan Annual Report (Condition 4 of EPBC 2009/4748)	<ul style="list-style-type: none"> • Department of the Environment, Water, Heritage and the Arts
Rehabilitation Report (in response to EPBC 2008/4170) within 5 years of implementation of Taxiway Bravo Biodiversity Offset Strategy	<ul style="list-style-type: none"> • Department of Infrastructure, Transport, Regional Development and Local Government • Canberra Airport - Board of Directors
A report verifying compliance of EPBC 2008/4170 conditions (within 3 months of completion of construction)	
Grassland Mapping (2013)	<ul style="list-style-type: none"> • Department of the Environment, Water, Heritage and the Arts
Biennial Grassland Earless Dragon Surveys	<ul style="list-style-type: none"> • Department of Infrastructure, Transport, Regional Development and Local Government • University of Canberra
Biennial Golden Sun Moth Surveys	<ul style="list-style-type: none"> • Canberra Airport - Board of Directors • ACT Parks, Conservation and Lands
Annual Environment Report	<ul style="list-style-type: none"> • Department of Infrastructure, Transport, Regional Development and Local Government • Canberra Airport - Board of Directors

In addition to reporting, Canberra Airport conducts regular consultation meetings with government departments and

major stakeholders. These meeting are summarised in Table 8 below.

Table 8: Consultation Meetings

CONSULTATION MEETINGS	TIMING
Department of the Environment, Water, Heritage and the Arts	Quarterly
Airport Environment Officer - Department of Infrastructure, Transport, Regional Development and Local Government	Monthly
Development planning liaison meeting, Department of Infrastructure, Transport, Regional Development and Local Government, Airservices Australia, Airlines	Quarterly
University of Canberra	Biannually
Canberra Airport - Board of Directors	Quarterly
ACT Parks, Conservation and Lands	As required
Friends of Grasslands	Biannually

Chapter eleven | Contingency Arrangements

Contingency arrangements are required in the event that management measures fail to mitigate or minimise impact on the NTG and listed threatened species habitat. This may result from human induced (e.g. fire, oil spill) or natural extreme events (e.g. prolonged drought). Table 9 below identifies possible impacts and mitigation measures.

Table 9: Contingency Arrangements

TRIGGERS	ACTIONS	RESPONSIBILITY
Environmental Incident eg: fuel, oil spill	<ul style="list-style-type: none">Implementation of Canberra Airport Standard Operating Procedures (SOP4); andSpill cleaned up and incident reported to Airport Environment Officer.	Canberra Airport
Aircraft Accident e.g. fire, fire fighting foam	<ul style="list-style-type: none">Implementation of Canberra Airport Standard Operating Procedures (SOP4); andSpill cleaned up and incident reported to Airport Environment Officer.	Canberra Airport
Prolonged Drought	<ul style="list-style-type: none">Review of ongoing management procedures i.e. reduction in mowing regime.	Director of Planning

Chapter twelve | Management Plan Review



This Threatened Species Management Plan will be updated as required to include details of research and rehabilitation outcomes in consultation with the Department of the Environment, Water, Heritage and the Arts.

A formal review of this document will be undertaken in preparation of the 2014 Master Plan, which will incorporate the 2014 Environment Strategy.



Chapter thirteen | Research



Canberra Airport is committed to contributing and understanding research to increase the body of knowledge for the ongoing management and rehabilitation of NTG and listed threatened species on Airport.

Canberra Airport has a number of trials underway, including a weed and grassland trial.

The aim of these trials is to improve the quality of NTG on Airport and rehabilitate disturbed areas to meet the definition of NTG.

Canberra Airport is also working with the University of Canberra to increase the body of knowledge for the Grassland Earless Dragon and Golden Sun Moth.

The following section is in response to referral EPBC 2009/4748, approval condition 2:

i) Results of research and details of any current and future research proposals.

13.1. Weed Trials

General observations at the Airport noted that the most significant weed was Chilean Needle Grass (*Nassella neesiana*) and that it tended to occur along the edges of hard surfaces such as runways, taxiways and roads. Canberra Airport identified that a broad acre method was needed to minimise the risk of weeds at the edges dispersing in areas of high quality NTG.

A weed trial was established in the “triangle” located north of the cross runway and adjacent to Taxiway Bravo. The edges of the weed triangle were boom sprayed.

The results show a reduction in Serrated Tussock and Chilean Needle grass around the edges of the weed triangle.

Further boom spraying and monitoring of the site is required, as the edges of the site were disturbed during the installation of vital airfield lighting.

13.2. Grassland Trials

In 2006 and 2007 high quality thatch harvested from the east of the Airport and the remaining high quality thatch harvested from Majura Park was spread onto poor quality grassland south of Taxiway Foxtrot to assist in increasing the diversity and quality of grassland. The 2008/2009 grassland monitoring shows no change in vegetation quality and the experiment in this area will not be repeated in this form.

In summer 2009, high quality thatch harvested from the east of the Airport was spread on an area in the north east corner of the Airport, with the aim of suppressing weeds and increasing grassland quality. The outcomes of this trial will be repeated in areas of high quality grassland if successful.

13.3. Translocation Site

The Department of the Environment, Water, Heritage and the Arts approved the Airport's application for a Permit to Take (Permit No.E2005-58339) for the removal and translocation of 0.86ha of NTG at Majura affected by development. The recipient site before translocation was classed as category 5 or exotic grass. After translocation disturbance tolerant native grasses and a soil crust containing mosses and algae had begun to develop in the recipient site. Vegetation density at the reception site is similar to that seen elsewhere at the Airport.

The site has been monitored every spring and autumn since the translocation in September 2005. The full results of the five year trial are not yet realized as there has been minimal rainfall and the absence of significant spring or autumn breaks. The translocation site has provided valuable information for future grassland trials such as:

- The sward needs to be translocated in intact sections;
- The reception site must not be over compacted as this restricts water penetration required to promote the natural germination of seed;
- Watering the reception site pre and post translocation will be investigated in future grassland trials; and
- The reception site will be sprayed twice for weeds prior to translocation in future trials.

13.4. Future Grassland Trials and Research

A translocation and/or reestablishment experiment is likely to be repeated using NTG that would otherwise be destroyed by development to reinstate areas of native or exotic grasses. A few of the options that will be considered are as follows:

- Collection of seed from an offset site to then be used to seed areas on Airport;
- Collection of forb seed on Airport to be used on Airport; and

- Replanting of forbs (otherwise affected by development) in areas of native grassland to encourage increased species diversity and NTG.

The timing for the implementation of any trials or rehabilitation works is dependent on weather conditions and seed, consultant and scientific information availability.

13.5. Grassland Earless Dragon Research

Canberra Airport is funding a joint Post Doctorate Fellowship for Grassland Earless Dragon research with the Australian Research Council and the University of Canberra. Canberra Airport also contributes the Airport's consultants' knowledge and advice, ongoing Grassland Earless Dragon monitoring and previous monitoring reports with the aim of collating population data for the University of Canberra's Grassland Earless Dragon research project. Any information obtained from Grassland Earless Dragon specimens' located on-Airport will be included in the research project to further increase the body of knowledge of this species.

In summary the primary components of the University of Canberra Post Doctorate Research Fellowship are:

1. Understanding the genetic relatedness of the remaining Grassland Earless Dragon population in the ACT and nearby NSW;
2. Understanding the relationship between grassland height and composition and Grassland Earless Dragon populations;
3. Identifying key habitat characteristics and features for ongoing management and the re-establishment of Grassland Earless Dragon habitat; and
4. Inform the Grassland Earless Dragon National Recovery Plan to enable the ongoing management and restoration of Grassland Earless Dragon habitat.

The outcomes of the research will include guidelines for the ongoing management of Grassland Earless Dragon habitat so as to maximise the rate of population increase and to restore habitat. The research is also expected to provide key insights into the habitat management mechanism for the Grassland Earless Dragon. This work will provide essential management information that will maximise the long term conservation of the Grassland Earless Dragon.

Details of the research outcomes from the Grassland Earless Dragon Post Graduate study will be published on the Canberra Airport's website in the form of hyper links to the University of Canberra website and to published articles.

13.6. Golden Sun Moth Research

Canberra Airport has contributed its consultant knowledge and time to assist in collecting data for the Golden Sun Moth count program. The program is financially supported by the World Wide Fund for Nature (WWF) in collaboration with the Friends of Grassland and the Institute for Applied Ecology at the University of Canberra. The research includes the following components:

1. An examination of the influences of habitat and landscape characteristics on the distribution of the species; and
2. The development and evaluation of reliable monitoring techniques.

Results of this research will provide conservation managers with a rational approach to the seasonal detection and monitoring of the Golden Sun Moth.

This information will provide valuable information regarding changes in Golden Sun Moth numbers and also assist in defining a Golden Sun Moth habitat.

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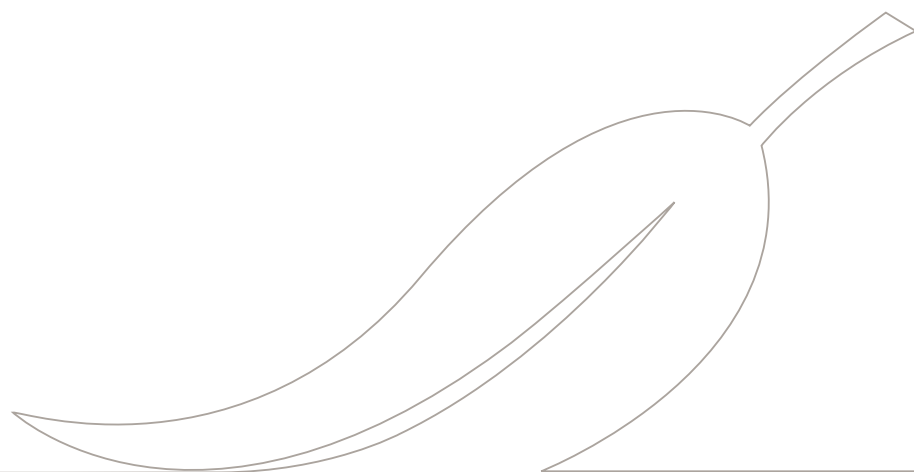
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