Australian Capital Territory

# Nature Conservation Biodiversity Research and Monitoring Program 2017

**Notifiable instrument NI2017–306**

made under the

**Nature Conservation Act 2014, s25 (Biodiversity research and monitoring program – conservator to prepare)**

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## 1 Name of instrument

This instrument is the *Nature Conservation Biodiversity Research and Monitoring Program 2017*.

## 2 Commencement

This instrument commences on 1 July 2017.

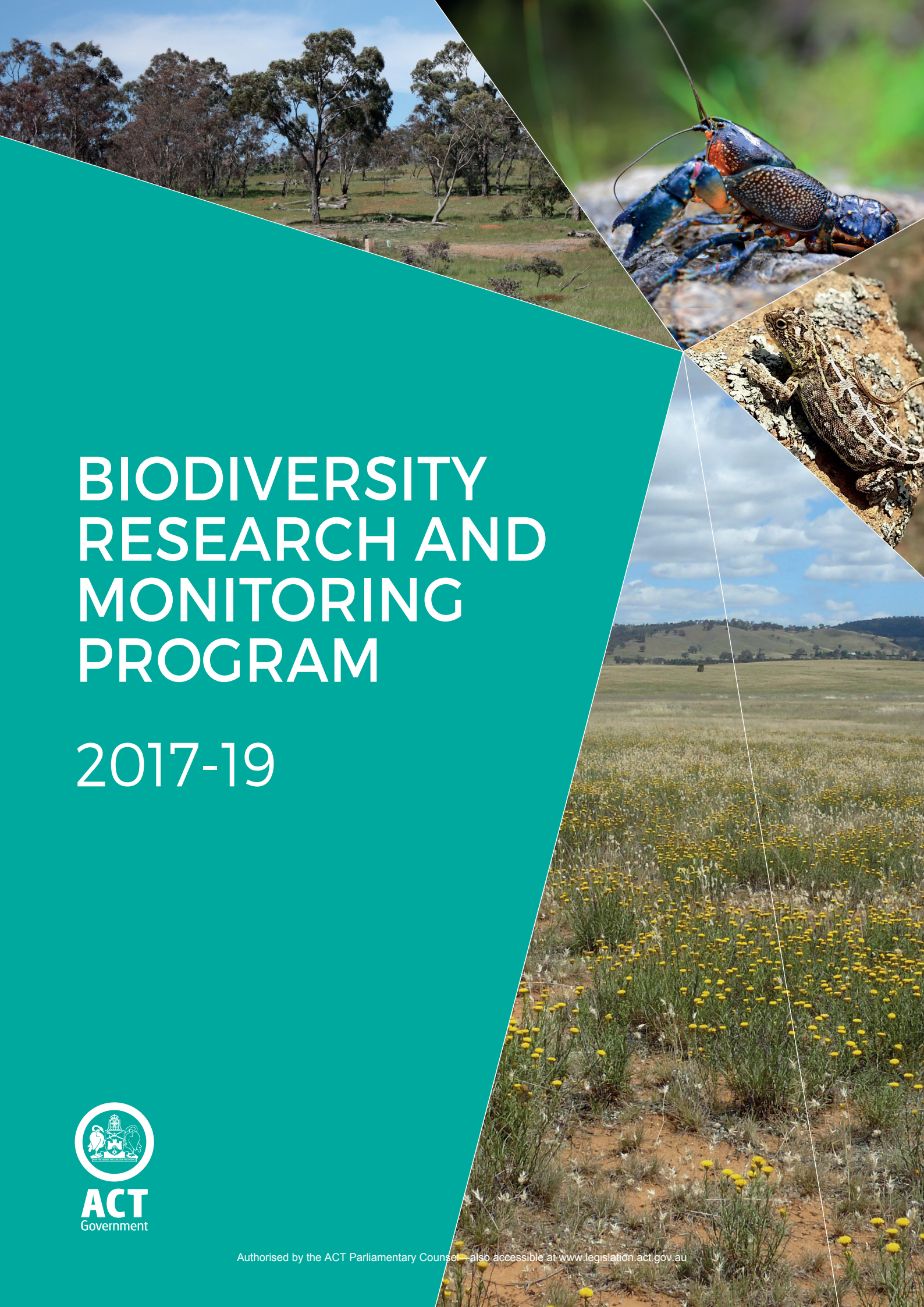
## 3 Biodiversity Research and Monitoring Program

Schedule 1 sets out the biodiversity research and monitoring program for the period 1 July 2017 to 30 June 2019 prepared by me.

## 4 Revocation

The *Nature Conservation Biodiversity Research and Monitoring Program 2015* (NI2015–426) is revoked.

Dr Annie Lane
Conservator of Flora and Fauna
16 June 2017



# BIODIVERSITY RESEARCH AND MONITORING PROGRAM

## 2017-19

ACT Government

Authorised by the ACT Parliamentary Counsel—also accessible at www.legislation.act.gov.au

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# Glossary

*Table 1: Glossary of terms used in the BRAMP 2017-19*

| For the purposes of the BRAMP 2017-19 the following definitions apply: | |
|---|---|
| ***biodiversity*** | *Variability among living organisms from all sources (including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part); and includes diversity within species and between species; and of ecosystems (*ACT *Nature Conservation Act 2014, s19)* |
| ***ecosystem condition*** | *Composition, structure and functionality of ecological values, including flora and fauna, ecosystem processes and/or ecosystem services (Conservation Effectiveness Monitoring Program –Brawata & Seddon, 2017)* |
| ***monitoring*** | *Long-term measuring and tracking of specified indicators, and evaluating data collected to inform decision-making needs* |
| ***research*** | *Applying scientific methods to investigate clearly defined questions which address the decision-making priorities of the ACT's biodiversity research and monitoring program, including evaluation of data collected* |
| ***adaptive management*** | *An approach which ensures that goals, actions, decisions and research are part of a continuous improvement cycle underpinned by regular analysis and evaluation of best available evidence* |

# PART A: About the biodiversity research and monitoring program

## 1. Purpose, process and context

The biodiversity research and monitoring program (BRAMP) primarily supports the role of the ACT Conservator of Flora and Fauna (Conservator) by setting out biodiversity research and monitoring priority activities for a specified two year period.

The BRAMP relates only to those aspects of the Conservator's role that are specific to monitoring and research.

Through the BRAMP, the Conservator aims to establish a strategic long-term monitoring program which:

- enables data to be collected and analysed to identify trends and changes in biodiversity and ecosystem condition in the ACT, including in the face of climate change; and
- provides an evidence base for:
    - improving environmental conservation policy, management and resource allocation decision-making; and
    - reporting on the condition of the environment in the ACT.

### 1.1 Requirements of the ACT Nature Conservation Act 2014

The BRAMP is a notifiable instrument under the ACT *Nature Conservation Act 2014.*

The scope of the BRAMP, and the role of the Conservator in preparing, implementing and reporting on the BRAMP, are defined by the ACT *Nature Conservation Act 2014.*

## 1.2 Definition of a biodiversity research and monitoring program

The ACT *Nature Conservation Act 2014* defines a BRAMP as:

> *"...a program designed to monitor the state of nature conservation generally in the ACT; and effective management of nature conservation in the ACT."* [1]

## 1.3 Stages of the biodiversity research and monitoring program

In preparing the BRAMP, the Conservator must[2]:

- consult the Scientific Committee about priorities for the BRAMP and appropriate methods for monitoring;
- consider the potential for engaging community organisations in monitoring activities; and
- consider arrangements for sharing and transferring monitoring data with other entities.

In selecting BRAMP activities, preference and prioritisation will be given to activities that align with the long-term strategic direction of the BRAMP, as detailed in section 2.

The BRAMP is implemented over a specified two year period, following its notification by the Conservator, and remains effective only for this period, unless otherwise stated.

The Conservator will prepare a BRAMP Report documenting progress against BRAMP listed activities, within 3 months of the completion of its specified two year period.[3]

*Table 2: Timeline of the BRAMP 2017-19*

| Milestone | Date |
|---|---|
| **BRAMP 2017-19 start date** | **1 July 2017** |
| **BRAMP 2017-19 end date** | **30 June 2019** |
| **BRAMP 2017-19 Report** | **30 September 2019** |

[1] *ACT Nature Conservation Act 2014, s24*
[2] *ACT Nature Conservation Act 2014, s25*
[3] *ACT Nature Conservation Act 2014, s26*

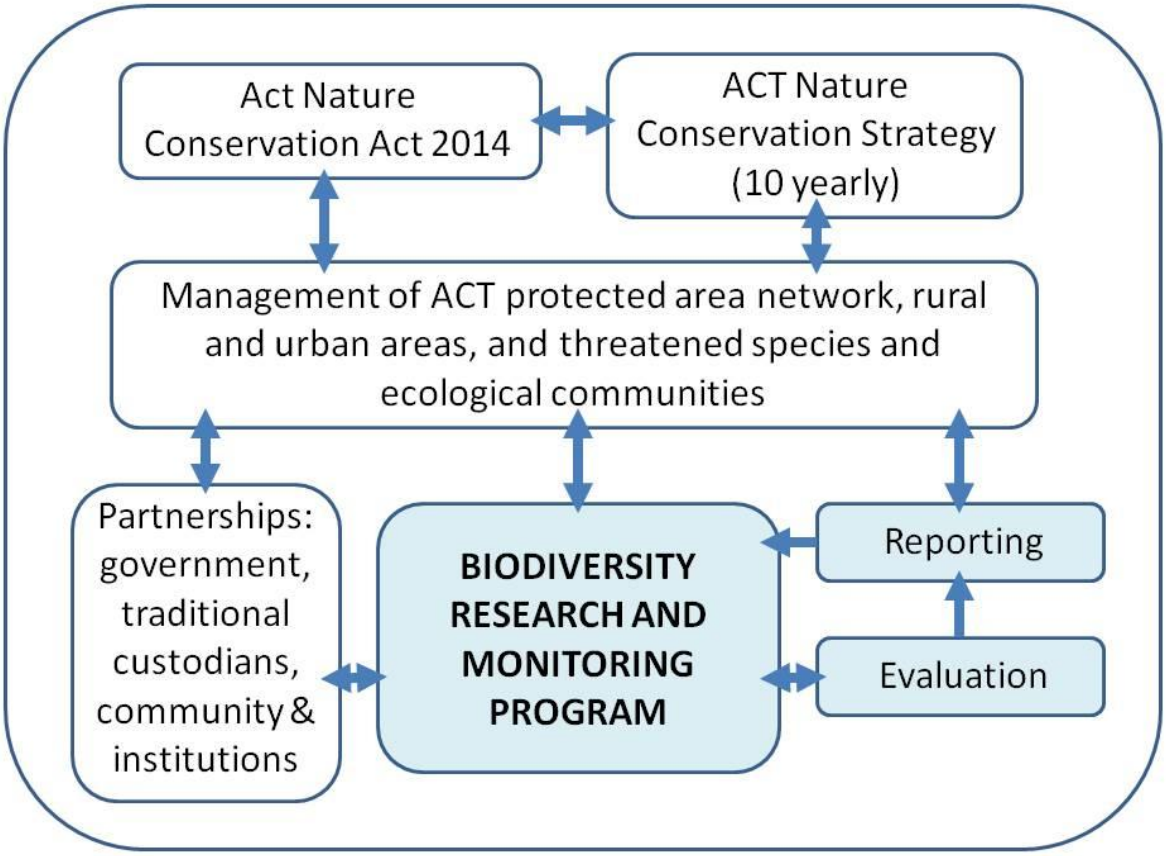
## 1.4 Operating context

The BRAMP is only one part of a broader system of ACT Government environmental policies and management practices as depicted in Figure 1. It is through the implementation of this

broader system, and within this operating context, that the ACT Government undertakes conservation and management of the environment, and engages with stakeholders on environmental issues.

*Figure 1: Operating context of the biodiversity research and monitoring program*

***Note:** ACT Government environmental policies and management are also influenced by the Australian Government Environment Protection and Biodiversity Conservation Act 1999, and national environmental commitments.*



# 2. Priorities and approach

BRAMP 2017-19 activities are listed in Part B. Their selection is based on the priorities and approach set out below.

## 2.1 Priorities for the biodiversity research and monitoring program

The BRAMP prioritises monitoring and research activities which:

A. Improve understanding of ecosystem integrity to support adaptive management;

B. Inform management of threatened ecological communities and species; and

C. Fundamental system related activities.

### A. Improve understanding of ecosystem integrity to support adaptive management

BRAMP monitoring and research activities will be used to provide an evidence base and fill knowledge gaps to inform active adaptive management by:

1. Establishing baselines, reference conditions, indicators, targets and thresholds for ecosystem integrity;
2. Tracking condition and trends of key indicators and identifying trigger points for management response;
3. Monitoring priority landscape restoration sites to assess management effectiveness;
4. Evaluating the impacts of major new and emerging stressors on ecosystem integrity (threats and threatening processes) including:
   a) e.g. habitat fragmentation, loss of connectivity, reduced genetic diversity, habitat/niche specialisation and/or niche shifts, role of keystone species and changes in soil health and condition; and
   b) developing an understanding of the interactions of ecosystem components;
5. Undertaking research into innovative ways to accelerate landscape restoration and enhance landscape resilience; and
6. Evaluating the overall effectiveness of management actions on landscape scale ecosystem condition.

### B. Inform management of threatened ecological communities and species

BRAMP monitoring activities and research will support and inform conservation management of threatened ecological communities and species by:

1. Establishing baselines, reference conditions, indicators, targets and thresholds for threatened ecological communities and species;

2. Monitoring threatened ecological communities' distributions and condition, and analysing the data to track changes and identify trends;
3. Monitoring threatened species' distributions and populations, and analysing the data to track changes and identify trends; and
4. Undertaking research to fill knowledge gaps to support the active adaptive management of threatened ecological communities and species, including in response to climate change and local, regional and national opportunities to enhance biodiversity and conservation outcomes.

**C. Fundamental system related activities**

BRAMP research and monitoring activities are supported by continuing improvements in information technology and systems for collecting, analysing and sharing information and findings.

## 2.2 Biodiversity research and monitoring program approach

The BRAMP approach consists of two key steps namely:

i. Monitoring and evaluation to assess landscape-scale ecosystem integrity; and
ii. Supporting active adaptive management decision-making.

### i. Monitoring and evaluation to assess landscape-scale ecosystem integrity

- Consistent with the ACT Nature Conservation Strategy 2013-23, the BRAMP enables landscape-scale management outcomes and ecosystem integrity to be measured and assessed.
    - Representative ecosystem units for the ACT have been identified through the Conservation Effectiveness Monitoring Program, for which monitoring plans are being developed.

### ii. Supporting active adaptive management decision-making

- BRAMP monitoring and research activities will contribute towards increasing the evidence on which to base informed decision-making for policy, management, conservation and resource allocation needs.
    - This includes improving provision of, and accessibility to, timely scientific analysis and information.

# PART B. Biodiversity research and monitoring program activities for 2017-19

Activities in the BRAMP 2017-19 have been broadly categorised into three groupings namely: ecosystem integrity level, species level, and fundamental activities, and are listed in Tables 4-6. Collectively they represent work that will help strengthen research and monitoring on a broader landscape scale, and across longer timeframes, to support active adaptive management.

*Table 3: List of acronyms used in Tables 4-6*

| CATEGORY | DESCRIPTION OF ACRONYM OR TERM |
|---|---|
| **General references** | **REF -** Refers to reference number. This number is not indicative of priority level. It is only intended for reference purposes<br>**TIMEFRAME** - Indicates the expected period or on-going nature of the activity. It is not limited to the period covered by the BRAMP<br>**ACTIVITY** - Activity identified as part of the BRAMP |
| **ACT Government Directorates** (In alphabetical order) | **CMTEDD** - Chief Minister, Treasury and Economic Development Directorate<br>**EPSDD** - Environment, Planning and Sustainable Development Directorate<br>**ESA -** Emergency Services Agency |
| **Project partners** (In alphabetical order) – identifies principal institutional or community partners involved | **ANBG** – Australian National Botanical Gardens<br>**ANU** – Australian National University<br>**BA** - Birds Australia<br>**CGs** – ACT Catchment Groups<br>**CISS** – Centre for Invasive Species Solutions<br>**COG** – Canberra Ornithologists Group<br>**CSIRO** – Commonwealth Scientific and Industrial Research Organisation<br>**Expert reference groups** – Specialist technical groups set up under the Conservation Effectiveness Monitoring Program<br>**ICON** – ICON Water<br>**JCU** – James Cook University<br>**NHCRC** – Natural Hazard Cooperative Research Centre<br>**OEH** – NSW Office of Environment and Heritage<br>**ParkCare** –Volunteer groups working with ACT Parks and Conservation Service<br>**SELLS** – NSW South East Local Land Services<br>**UC** – University of Canberra<br>**UMDR** – Upper Murrumbidgee Demonstration Reach<br>**WWT** – Woodlands and Wetlands Trust |

## A. ECOSYSTEM INTEGRITY

*Table 4: Ecosystem integrity level activities - biodiversity research and monitoring program 2017-19*

| REF | ACTIVITY | LOCATION | PROJECT PARTNERS | MILESTONES OR SPECIFIC ACTIONS | TIMEFRAME |
|---|---|---|---|---|---|
| A.1 | Baseline vegetation mapping in the ACT | • ACT-wide | EPSDD | • Complete vegetation map<br>• Undertake ground-truthing and accuracy assessment<br>• Publish spatial data on ACTMapI | 2013-18 |
| A.2 | Undertake bioclimatic modelling and analysis to identify biodiversity climate refugia for selected threatened, rare and keystone in the ACT and region | • ACT and region | EPSDD, OEH | • Develop approach and prepare model inputs<br>• Model species distributions<br>• Map biodiversity refugia<br>• Evaluate model performance | 2017-19 |
| A.3 | Develop a conservation effectiveness monitoring program for representative ecosystems in the ACT reserve system | • Lowland: native grasslands, woodlands and forests<br>• Upland: native grasslands, woodlands and forests<br>• Upland bogs and fens<br>• Aquatic and riparian | EPSDD, Expert reference groups, ParkCare, COG, other volunteers including through Canberra Nature Map | • Define ecosystem model<br>• Develop monitoring plan incorporating indicators and metrics of condition and stressors<br>• Define monitoring methods<br>• Evaluate and report on management effectiveness and ecosystem condition against monitoring plans | 2016-19 |
| A.4 | Research and monitor the impact of weed and pest animal management on ecosystem condition | • Lowland native grasslands in the ACT reserve system | EPSDD | • Design trial and implement pilot study | 2017-22 |

*Table 4 continued: Ecosystem integrity level activities - biodiversity research and monitoring program 2017-19*

| REF | ACTIVITY | LOCATION | PROJECT PARTNERS | MILESTONES OR SPECIFIC ACTIONS | TIMEFRAME |
|---|---|---|---|---|---|
| A.5 | Develop improved survey techniques; and research habitat requirements, and identify and implement techniques for ecosystem restoration | • Lowland native grasslands in the ACT reserve system | EPSDD | • Monitor important components of grassland structure, soil and invertebrate community<br>• Design and implement more effective techniques to monitor Perunga Grasshopper, Canberra Raspy Cricket, Striped Legless Lizard and the Grassland Earless Dragon<br>• Consider and implement appropriate population recovery techniques (e.g. captive breeding, assisted re-colonisation or habitat connectivity)<br>• Research trials on introducing disturbance regimes (fire, slashing, grazing) and rock additions to enhance habitat ecosystem condition | 2013-18 |
| | | • Lowland native grasslands | EPSDD, Gungahlin Strategic Assessment | • Monitor biodiversity offsets – includes monitoring threatened fauna | 2015-20 |
| A.6 | Monitor for controlled native species management – Eastern Grey Kangaroo | | EPSDD,CSIRO, ParkCare, other volunteers | • Monitor and analyse relationship between kangaroo population and environmental conditions, and the effectiveness of management actions.<br>• Develop a model for estimating kangaroo population numbers in reserves | 2017-19 |

*Table 4 continued: Ecosystem integrity level activities - biodiversity research and monitoring program 2017-19*

| REF | ACTIVITY | LOCATION | PROJECT PARTNERS | MILESTONES OR SPECIFIC ACTIONS | TIMEFRAME |
|---|---|---|---|---|---|
| A.6 cont. | Monitor for controlled native species management – Eastern Grey Kangaroo | • Weston Park<br>• Gold Creek golf course<br>• Australian National Botanic Gardens | EPSDD, CSIRO, CISS | • Monitoring of kangaroo fertility control with GonaCon Immunocontraceptive Vaccine and research into dart delivery method<br>• Report on the results from Stage 1 of the research trial | 2015-19 |
| A.7 | Evaluate effectiveness of lowland woodland restoration | • Mulligans Flat Woodlands Sanctuary | EPSDD, ANU, WWT | • Assess woodland condition and connectivity | 2013-20 |
| A.8 | Map dieback affecting yellow box-red gum woodlands and analyse data to assess trends and causes | | EPSDD | • Design method to identify *Eucalyptus blakelyi* dieback and map dieback<br>• Undertake multi-criteria analysis to understand potential causes | 2017-18 |
| A.9 | Research and monitor to inform fire regimes for fuel management and conservation outcomes | • Canberra Nature Park<br>• Namadgi National Park | EPSDD, ESA, CMTEDD, NHCRC, ParkCare | • Undertake habitat mapping, analysis and evaluation of fire-habitat response for selected keystone and threatened species | 2013-19 |
| A.10 | Identify indicator species for water quality, environmental flow and catchment health, including under climate change | | EPSDD | • Evaluate species suitability as indicators of water quality and/or catchment health<br>• Explore links between specific sources of pollution (e.g. pesticides, treated sewerage outputs) and indicator species | 2017-19 |

*Table 4 continued: Ecosystem integrity level activities - biodiversity research and monitoring program 2017-19*

| REF | ACTIVITY | LOCATION | PROJECT PARTNERS | MILESTONES OR SPECIFIC ACTIONS | TIMEFRAME |
|---|---|---|---|---|---|
| A.11 | Develop an integrated water quality monitoring plan | | EPSDD | • Develop plan and undertake monitoring<br>• Undertake research to understand water quality processes in Lake Tuggeranong<br>• Undertake research to assess impact on water quality of deciduous trees nutrient budget for urban catchments<br>• Monitoring program to evaluate impact of new urban developments on water quality | 2017-19 |
| | | | EPSDD, ICON, SELLS, CGs | • Macro-invertebrate (AUSRIVAS) surveys ongoing<br>• Instream sediment monitoring program developed<br>• Catchment Health Indicator Program – Waterwatch<br>• Frogwatch annual census | On-going<br><br>2017 |
| A.12 | Install stage 2 of engineered log jam (ELJ) and monitor river depth and fish species changes | • Tharwa | EPSDD, UMDR | • Monitor before ELJ construction<br>• Complete second ELJs<br>• Post-construction monitoring and assessment of ELJs | 2016-19 |

## B. SPECIES

*Table 5: Species level activities - biodiversity research and monitoring program 2017-19*

| REF | ACTIVITY | LOCATION | PROJECT PARTNERS | MILESTONES OR SPECIFIC ACTIONS | TIMEFRAME |
|---|---|---|---|---|---|
| B.1 | Research re-introduction, and/or assisted colonisation of, selected locally extinct species, and monitoring of re-introductions/colonisation | • Mulligans Flat – Goorooyarroo woodlands | EPSDD, ANU, CSIRO, WWT | • Research and monitoring on the release of Eastern Bettongs into an unfenced environment | 2012-20 |
| B.2 | Research re-introduction, and/or assisted colonisation of, selected locally extinct species, and monitoring of re-introductions/colonisation | • Mulligans Flat – Goorooyarroo woodlands | EPSDD, ANU, CSIRO, JCU | • Research and monitoring on the reintroduction of Eastern Quolls and Yellow-footed Antechinus | 2014-20 |
| B.3 | Research re-introduction, and/or assisted colonisation of, selected locally extinct species, and monitoring of re-introductions/colonisation | • Kama nature reserve | EPSDD | • Undertake trial translocation of Striped Legless Lizards to research the potential to create new populations and monitor survival rates | 2012-20 |
| B.4 | Research re-introduction, and/or assisted colonisation of, selected locally extinct species, and monitoring of re-introductions/colonisation | • Lowland native grasslands<br>• Lowland woodlands | EPSDD, ANBG, UC, ICON, ANU | • Research and monitor translocation options for threatened plant species (e.g. Button Wrinklewort and Sweet Purple Pea) | 2016-19 |
| B.5 | Survey and monitor threatened flora and fauna species | | EPSDD, COG, other volunteers including through Canberra Nature Map | • Species be determined annually for assessment of success of conservation efforts and reporting against Action Plans<br>• Report survey and monitoring outcomes in the Conservation Research report | On-going |

*Table 5 continued: Species level activities - biodiversity research and monitoring program 2017-19*

| REF | ACTIVITY | LOCATION | PROJECT PARTNERS | MILESTONES OR SPECIFIC ACTIONS | TIMEFRAME |
|---|---|---|---|---|---|
| B.6 | Research on germination strategies for plants in Alpine Bogs | | EPSDD, ANBG | | 2014-18 |
| B.7 | Enhanced inventory of fauna in conservation regions of the ACT | • Namadgi National Park<br>• Majura valley<br>• Bullen Range | EPSDD | • Survey for koalas in suitable habitat | 2017-19 |
| B.8 | Research and monitor Corroboree Frog wild populations, and undertake captive breeding and reintroductions | • Namadgi National Park<br>• Tidbinbilla | EPSDD | • Monitor populations in upland bogs and fens<br>• Continue to support captive breeding program at Tidbinbilla | On-going |
| B.9 | Research and monitor movement, territorial behaviour, feeding and nesting success of Little Eagles in and around the ACT | • ACT and adjacent land areas of NSW | EPSDD, UC, CSIRO, ANU | • Identify critical and adequate conservation areas to secure long-term viable wild populations of Little Eagles for planning | On-going |
| B.10 | Monitor movement of the Latham Snipe, an internationally migratory species. | • Jerrabomberra Wetlands | EPSDD, WWT, COG, BA | • Tracking of individual bird's flight between the ACT and Japan and surveying sites across the ACT to inform planning and management of wetlands. | On-going |
| B.11 | Survey for threatened fish species | • Cotter River | EPSDD, ICON, UC | • Survey threatened fish species - including Trout Cod, Macquarie Perch, Two-spined Blackfish | On-going |
| B.12 | Monitor following Carp removal and native fish stocking | • Isabella ponds and Upper stranger | EPSDD | • Monitor prior to carp removal<br>• Stock with native fish and monitor after carp removal<br>• Model relationship between sampling method and actual carp numbers | 2017-22 |

## C. FUNDAMENTAL SYSTEM LEVEL

*Table 6: Fundamental system level activities - biodiversity research and monitoring program 2017-19*

| REF | 5.0 FUNDAMENTAL ACTIVITIES | LOCATION | PROJECT PARTNERS | MILESTONES OR SPECIFIC ACTIONS | TIMEFRAME |
|---|---|---|---|---|---|
| 5.1 | Improve data collection, consolidation and delivery including through spatial tools such as ACTMapi, dataACT and ArcGIS | | EPSDD, Community and institutional stakeholders | | On-going |
| 5.2 | Investigate the use of aerial imagery to map grassland plant community and vegetations structure | | EPSDD | | 2016-2017 |
| 5.3 | Capture native flora and fauna records in digital applications | | EPSDD, Application developers, Community | • Support the use of Canberra Nature Map for the capture of flora and fauna records and use by the Community | 2015-2019 |