

## ACTION PLAN No. 35

The Little Eagle *Hieraetus morphnoides* was declared a vulnerable species on 22 February 2008 in accordance with section 38 of the *Nature Conservation Act 1980*. Section 40 of the Act requires the Conservator of Flora and Fauna to prepare an Action Plan in response to each declaration. This is the Action Plan for the:

### Little Eagle *Hieraetus morphnoides*

#### Preamble

The *Nature Conservation Act 1980* establishes the ACT Flora and Fauna Committee with responsibilities for assessing the conservation status of ACT flora and fauna and the ecological significance of potentially threatening processes. Where the Committee believes that a species or ecological community is threatened with extinction or a process is an ecological threat, it is required to advise the responsible Minister and recommend that a declaration be made accordingly.

Flora and Fauna Committee assessments are made on nature conservation grounds only and in a regional context. They are guided by criteria set out in its publication *Threatened Species and Communities in the ACT: criteria for assessment, September 2001*.

In making its assessment of the Little Eagle, the Committee concluded that the criteria for a vulnerable species were satisfied as indicated in the adjacent table. In response to a Committee recommendation, the Minister made a corresponding declaration.

The Conservator of Flora and Fauna is required to develop a management response to each declaration by way of an Action Plan. The plan must contain proposals for the identification, protection and survival of a declared species.

This is the Action Plan for the Little Eagle *Hieraetus morphnoides*. Whilst its legal authority is confined to the Australian Capital Territory, management considerations are addressed in a regional context.

#### Table 1 Criteria satisfied

- 2.2 Species is observed, estimated, inferred or suspected to be at risk of premature extinction in the ACT region in the medium-term future, as demonstrated by the following:
- 2.2.1 Current serious decline in population or distribution from evidence based on:
    - 2.2.1.1 Direct observation, including comparison of historical and current records.

#### Conservation status

##### Australian Capital Territory

Vulnerable. Declared under Section 38 of the *Nature Conservation Act 1980*. Notified in Disallowable Instrument No. DI2008-26, 25 February 2008.

##### New South Wales

Vulnerable. Listed in Part 1 of Schedule 2 of the *NSW Threatened Species Conservation Act 1995*. Gazetted 12 February 2010.

#### Links with other plans

Measures proposed in this Action Plan complement those proposed in:

- Action Plan No. 27: Woodlands for Wildlife: ACT Lowland Woodland Conservation Strategy
- Action Plan No. 28: A Vision Splendid of the Grassy Plains Extended: ACT Lowland Native Grassland Conservation Strategy

- Action Plan No. 29: Ribbons of Life: ACT Aquatic Species and Riparian Zone Conservation Strategy.

## Species description and ecology

### DESCRIPTION

The Little Eagle *Hieraetus morphnoides* is one of the smallest eagles in the world. It is a stocky, powerful bird with a broad head, fully feathered legs and a square-cut, barred tail (Figure 1). Adults weigh between 500 and 1200 g with a body length of 450–550 mm. Wingspan is about 120 cm with males having longer wings in proportion to their bodies, but being nearly half the weight of females.

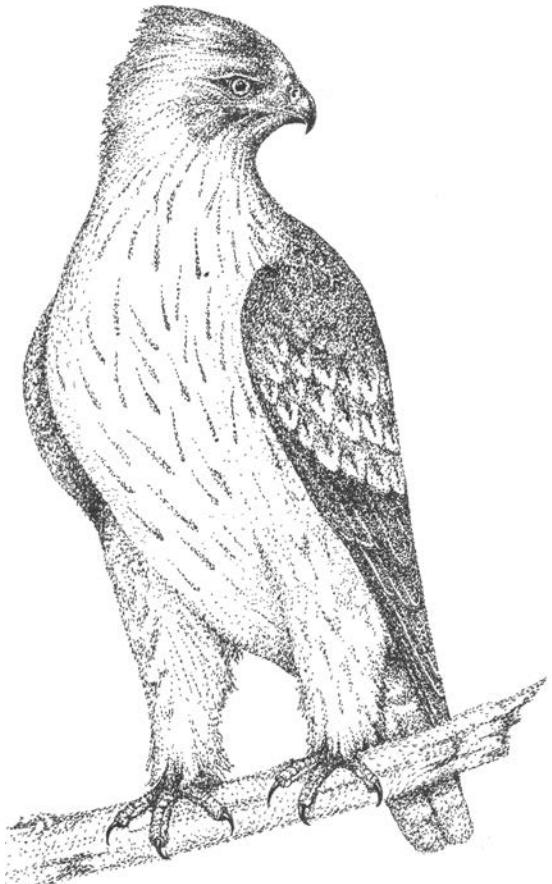


Figure 1 Little Eagle

The Little Eagle occurs in light and dark colour forms. The most common is the light form which is dark brown above with black streaks on the head and neck, and a sandy to pale underbody. The dark form is similar except the head and underbody is usually darker brown or rich rufous. The sexes are similar with females being larger and typically darker. Juveniles are

similar to adults but tend to be more strongly rufous in colour with less contrast in patterns (Marchant and Higgins 1993; Ferguson-Lees and Christie 2001; Olsen and Fuentes 2004; Debus 1998).

### HABITAT

Typical habitat for the Little Eagle includes woodland or open forest. Higher abundance of the species is associated with hillsides where there is a mosaic of wooded and open areas such as riparian woodlands, forest margins and wooded farmland. Little Eagles usually avoid large areas of dense forest, preferring to hunt in open woodland, where the birds use trees for lookouts (Marchant and Higgins 1993; Ferguson-Lees and Christie 2001). In the ACT, Little Eagles frequent open woodland and riparian areas (Olsen and Fuentes 2004).

### BREEDING

Little Eagles nest in open woodland (usually on hillsides) and along tree-lined watercourses, with the nest typically placed in a mature, living tree. The birds build a stick nest lined with leaves and may use different nests in successive years, including those of other birds such as ravens. Two eggs are usually laid in late August to early September (Marchant and Higgins 1993). After an incubation period of about 37 days, one or two young are fledged after approximately eight weeks (Olsen and Fuentes 2004; Debus et al. 2007; Debus and Ley 2009).

Little Eagle nesting territories are defended against intruders and advertised by soaring, undulating flight display, conspicuous perching and/or calling (Marchant and Higgins 1993; Debus et al. 2007; Bounds 2008). Movement behaviour varies between individuals, and may be partly migratory, dispersive or permanently resident (Marchant and Higgins 1993).

### DIET

Little Eagles hunt live prey and occasionally take carrion. The eagles search for prey by soaring (up to 500 m altitude) or by using an elevated exposed perch. The species is an agile, fast hunter swooping to take prey on the ground in the open but also from trees and shrubs (Marchant and Higgins 1993; Olsen et al. 2006; Debus et al. 2007; Debus and Ley 2009). Recorded prey species (from feeding observations, nest remains and faecal pellets) show considerable variation indicating a broad diet, which seems to be determined primarily by the availability of prey of a suitable size.

Rabbits (mostly juveniles), birds (parrots and small passerines < 500 g), insects (such as Christmas beetles *Anoplognathus* sp. and Cicadas) and reptiles are typical dietary inclusions (Baker-Gabb 1984; Marchant and Higgins 1993; Debus 1998; Debus and Rose 1999; Olsen and Osgood 2006; Debus et al. 2007; Debus and Ley 2009; Olsen et al. 2006, 2010). Debus (1998) notes that their diet varies geographically; the diet in northern Australia has a high proportion of birds, in the arid zone is mostly lizards, and in southern Australia has a high proportion of juvenile rabbits. In the ACT region its diet comprises mostly rabbits and to a lesser extent birds (especially rosellas, magpie-larks and starlings) (Olsen and Fuentes 2004; Olsen et al. 2006, 2010).

There is some evidence of prey partitioning between Little Eagles and the sympatric, larger Wedge-tailed Eagle *Aquila audax*, with the latter tending to take larger prey and to eat more carrion (Baker-Gabb 1984; Debus and Rose 1999; Olsen et al. 2006, 2010). However, rabbits are the most common dietary item for both eagle species near Canberra (Olsen et al. 2010), indicating potential for competition for prey. Both species also eat carrion and it is possible that the more numerous Wedge-tailed Eagles in the ACT region keep Little Eagles away from macropod carcasses, and that Little Eagles would eat more carrion if not excluded by Wedge-tailed Eagles (Olsen et al. 2010).

## DISTRIBUTION AND ABUNDANCE

The Little Eagle is endemic to Australia and is distributed throughout the mainland. In south-eastern Australia there has been a general and continuing decline in its abundance over the last 30 years based on indices established by national and regional censuses.

In the first national bird atlas in 1977–81, the Little Eagle was reported in 65% of one degree grid cells across Australia, with mostly high reporting rates (more than 40% of surveys per grid) across NSW and Victoria. Breeding was recorded in 11% of cells, with the highest rates in NSW and Victoria (Blakers et al. 1984). During the second national bird atlas in 1998–2002, the Little Eagle was recorded in 59% of grid cells, at mostly low reporting rates (recorded in less than 20% of surveys per grid). Breeding was recorded in 5% of grid cells (Barrett et al. 2003, 2007). Overall, there has been a national decline in reporting rate of 14%. In NSW over the last 20 years (two Little Eagle generations) the decline in reporting rate has been 39%, and over the past 30 years has been 50%, with an accelerating trend since the

1990s (Bounds 2008). The decline in reporting rate over the past 20 years for the South Eastern Highlands bioregion (DSEWPC 2011) has been greater than 20% (Barrett et al. 2003, 2007). This bioregion includes the ACT.

Sightings of the Little Eagle have been recorded across much of the ACT, but the breeding range is in the lower northern parts of the ACT with the highest concentrations in the Murrumbidgee and the Molonglo river corridors (Taylor and COG 1992). The Little Eagle has undergone greater than 70% decline over the last 20 years. For the period 1990–1992 the number of ACT breeding territories reported was 13 (Taylor and COG 1992) or 11 (Olsen 1992) whereas in the same number of years two decades later there were three or two, i.e 3 in 2009 (Olsen et al. 2010), 2 in 2010 on the same sites (Olsen et al. 2012) 1 in 2011 and 1 in 2012.

Breeding success is likely to be a key indicator of the Little Eagle's status and the lower Molonglo River valley appears to have been a stronghold for the species in the ACT in recent times. Much of the area is to be developed for housing the increasing Canberra population.

## Threats

The main threat to the Little Eagle appears to be loss of habitat. In the ACT this is mostly due to the encroachment of urban development on remnant woodland and grassland. Associated human activity may also cause the retreat of Little Eagles from nearby, otherwise suitable habitat (Debus 2005; Olsen and Fuentes 2005; Olsen and Osgood 2006; Debus et al. 2007; Olsen et al. 2008).

Approximately 80% of the estimated area of lowland woodland in the ACT at the time of European settlement has been lost (ACT Government 2010). In 2004 the urban development of East O'Malley woodland displaced the last active Little Eagle nest in the urban area (Olsen and Fuentes 2005). The Little Eagle has been noted as one of the species that would be affected by urban development in the Lower Molonglo Valley (Debus 2008).

Protecting nest trees e.g. placing a buffer around them, is not necessarily sufficient for conservation. Foraging areas also need to be protected. Nesting and foraging areas may be disjunct, with foraging areas several kilometres away from the nest tree, which is typically located in woodland (Olsen and Osgood 2006;

Debus and Ley 2009). Radio tracking or GPS studies would be useful to quantify home range size and habitat use.

There has been speculation that loss of woodland nesting habitat and increased kangaroo abundance in and around the city may have resulted in an increased level of interaction between Little Eagles and the larger, dominant Wedge-tailed Eagle. Wedge-tailed Eagles breed earlier than Little Eagles and appear to compete for food, nests and nest-sites, and have been known to kill Little Eagles (Debus 2005; Olsen et al. 2006, 2010). Such interactions may have resulted in Little Eagles being displaced from territories and/or a decrease in their breeding success (Olsen et al. 2006; Debus et al. 2007). In the ACT, the remaining Little Eagle nests are five kilometres or more away from Wedge-tailed Eagle nests (Olsen and Fuentes 2005; Olsen et al. 2008, 2009). Breeding pairs of Little Eagles have been observed to move into areas vacated by Wedge-tailed Eagles due to human interference (Olsen et al. 2006).

Direct or secondary poisoning by pesticides such as Pindone used for rabbit control has been suggested as a possible cause for the death of a number of raptors in the ACT, including Little Eagles (Olsen et al., 2010). The paucity of information on home ranges and habitat use for Little Eagles makes it difficult to specify an appropriate safe distance from a nesting site for the application of pesticides (Olsen and Osgood 2006).

These issues are not confined to the ACT. In NSW over 50% of forest and woodland has been cleared (Lunney 2004). Much of the remaining habitat that is important for eagle breeding is under ecological stress (Morgan 2000; Barrett et al. 2007). In NSW 'Clearing of native vegetation' is recognised as a Key Threatening Process under the *Threatened Species Conservation Act 1995*. Likewise, Pindone for rabbit control is readily available in all jurisdictions and potential risk to raptors is not widely appreciated.

There is likely to be ready movement of Little Eagles between NSW and the ACT, meaning that population change has to be considered on a regional basis, and management of threats would ideally be the same.

## Major conservation objective

The objective of this Action Plan is to maintain in the long term, a viable, wild population of

Little Eagles as a component of the indigenous biodiversity of the ACT and region.

This objective is to be achieved through the following strategies:

### **Survey, Monitoring and Research**

Promoting and participating in a program of survey, monitoring and research, aimed at better understanding of the ecology of the species and identifying and managing causes of population decline.

### **Protection**

Identifying and protecting habitat critical to survival of the species in the ACT.

### **Regional Co-operation**

Co-operating with state and local government agencies in formulating and implementing conservation measures.

### **Community Engagement**

Increasing community awareness of the need to protect the species and its habitat, and supporting related community-based conservation action.

## **Conservation issues and intended management actions**

The primary conservation issue for the Little Eagle in the ACT is retention of adequate foraging and breeding habitat. Core habitat in the ACT comprises grassland, lowland woodland and riparian areas where eagles can hunt and establish breeding territories.

Much of the former lowland area of the ACT is now occupied by Canberra, and the remaining areas of these habitat types will be reduced by further urban expansion to accommodate the increasing human population, eg development of the Lower Molonglo valley. Approximately forty nature reserves have been identified in and around the urban area but none is large enough and of suitable habitat to be likely to meet the needs of even one breeding pair of Little Eagles.

For example a large area around one of the recently used nest sites at Belconnen is planned for urban development. While Kama Nature Reserve nearby has been preserved from development, and is important for conservation of many of the elements of endangered lowland grassland and woodland,

its size at 0.15 sq km, is two orders of magnitude too small to permanently provide for a pair of Little Eagles. This example is likely to illustrate the general pattern of the relationship between the Little Eagle and the city of Canberra.

It is difficult to evaluate the level of threat posed by Pindone used to poison rabbits. Based on toxicity studies with Wedge-tailed Eagles, it seems likely that some rabbit carcasses contain sufficient toxin to kill a Little Eagle. However Little Eagles take mainly juvenile rabbits (as live prey) and for effectiveness, rabbit control is preferably timed to avoid the season when juveniles are present. ACT government rabbit poisoning programs include several measures to reduce the risk to raptors, including observation during the 'free feeding' stage (using non-toxic bait), and collecting any visible carcasses early in the morning. (Most rabbits die in cover or underground.) However Pindone is freely available, and is used by other landholders also, both in the ACT and through the range of the Little Eagle. Other toxins, and other hypothetical causes of population decline should also be considered.

Existing information includes reliable, time-based records of distribution, nesting sites and breeding success for the species. Such information will assist in identifying ecological threats, determining research needs, and developing protection and management strategies.

## SURVEY, MONITORING AND RESEARCH

Critical to effective conservation actions for the Little Eagle is a greater understanding of its habitat use, home range requirements, and whether interactions between Little Eagles and Wedge-tailed Eagles have increased to a level that is detrimental to Little Eagle breeding success. There is also concern that Little Eagles may be at risk of incidental poisoning from pest control programs.

There has been a long-term program of raptor survey and monitoring in the ACT and region undertaken by community-based naturalists (including Canberra Ornithologists Group and the University of Canberra). It is desirable that these programs continue and that they include survey and monitoring of active nests, which can provide information on numbers of breeding pairs and their breeding success.

## Objective

A better understanding of the ecology of the Little Eagle is developed and used to identify and manage causes of population decline.

### Actions

1. Participate in and support survey, monitoring and research by tertiary institutions; support involvement by community based organisations to:
  - monitor the breeding success of the Little Eagle; and
  - improve understanding of habitat use and home range of remaining breeding birds in ACT

Seek funding to:

- improve understanding of the territory overlap between Little Eagles and Wedge-tailed Eagles
  - investigate the hypothesis that Pindone and other chemicals have caused the decline of Little Eagles, and alternative hypotheses.
2. In developing pest control programs, use information from surveys, monitoring and research, including on home ranges and habitat use for Little Eagles to assess the likely susceptibility of Little Eagles to indirect poisoning from those programs. Modify programs accordingly.

### Indicators

1. There is improved understanding of the ecology of the Little Eagle (in particular, distribution, breeding success, habitat use, home range, territory overlap with the Wedge-tailed Eagle) and this information is used to inform conservation actions to protect the species.
2. Information on the ecology of the Little Eagle is taken into consideration in preparing pest control programs, so as to lessen the risk of incidental poisoning.

## PROTECTION: IDENTIFYING AND PROTECTING CRITICAL HABITAT

The primary threat to the Little Eagle is loss of habitat, including nest sites and foraging areas. The preferred habitat for the species in the ACT is woodland, grassland and riparian areas, especially where these occur together as a mosaic. Conservation objectives and actions for these habitat types are set out in the relevant Action Plans, namely:

- Action Plan No. 27: Woodlands for Wildlife: ACT Lowland Woodland Conservation Strategy

- Action Plan No. 28: A Vision Splendid of the Grassy Plains Extended: ACT Lowland Native Grassland Conservation Strategy
- Action Plan No. 29: Ribbons of Life: ACT Aquatic Species and Riparian Zone Conservation Strategy.

These action plans provide the main vehicle for identification and protection of habitat for the Little Eagle in a landscape context. However, additional actions will be required to identify and protect nesting sites and associated foraging habitat. The *Nature Conservation Act 1980* provides for protection of nest sites. Other statutory protection mechanisms are outlined below:

- 1. Reservation:** The strongest statutory mechanism for protecting sites of conservation significance. Extensive riverine habitats in the Murrumbidgee River Corridor and the Lower Molonglo River Corridor are protected in this way.
- 2. Memorandum of Understanding (MOU):** MOUs between the ACT Government and landholders, including the Commonwealth Government, provide a means by which sites of conservation significance can be managed to protect their values, while enabling other compatible land uses to occur.
- 3. Land Management Agreements (LMA) for leased rural land:** LMAs establish an agreed framework for sustainable management of the land. Management standards may be agreed in recognition of particular conservation issues.
- 4. Off-reserve conservation on Public or Unleased Land within the urban area:** Not all public land is reserved for nature conservation, but conservation values may be present notwithstanding. The general provisions of the *Nature Conservation Act 1980* apply, including the protection of nests. The *Nature Conservation Act 1980* also has provisions for the Conservator to give directions for the protection of native plants and animals (Conservator directions).

The results of monitoring and research will be used to establish a minimum set of attributes that must be satisfied to adequately protect a nest site and associated foraging area. Where the required studies or ecological data are currently lacking, as an urgent interim measure, conservation actions will be based on best available knowledge and expert

opinion. The lower Molonglo River valley will be a focus of attention given land use pressures and its historical significance as a breeding area for Little Eagles.

#### Objective

Habitat sufficient to maintain a viable, wild population of Little Eagles in the long term is maintained in the ACT and region. This includes nesting sites and foraging areas.

#### Actions

1. Apply formal measures (reservation, memorandums of understanding, land management agreements, off-reserve conservation mechanisms) to protect and manage Little Eagle habitat in the ACT that complement actions in ACT conservation strategies (Action Plans 27, 28, 29).
2. Give identified nest sites and foraging areas a high priority for protection. Protect known previous nest sites at Molonglo Valley, Uriarra East and Dunlop with a buffer.
3. Undertake management actions on ACT Government managed land, and provide specifications and advice to other landholders and managers, aimed at protecting Little Eagle habitat.

#### Indicators

1. Formal measures have been taken to protect and manage Little Eagle habitat in the ACT, with a high priority given to nest sites and foraging areas.
2. Management actions have been taken on ACT Government managed land aimed at protecting habitat.
3. Specifications and advice on conserving Little Eagle habitat has been provided to other landholders and land managers who manage land where habitat occurs.

## REGIONAL CO-OPERATION

Habitat for the Little Eagle in the South Eastern Highlands bioregion is under ecological stress generally and regional population decline of the species is evident. Liaison with agencies outside the ACT that are involved in the conservation of the Little Eagle is essential for a regional conservation effort.

#### Objective

Actions to conserve the Little Eagle in the ACT are part of a coordinated regional approach.

### Action

The ACT will promote a coordinated regional conservation effort for the Little Eagle by continuing to liaise with other State and Commonwealth conservation agencies.

### Indicator

Regional liaison is maintained and ACT conservation efforts are complemented by actions throughout the South Eastern Highlands bioregion.

## COMMUNITY ENGAGEMENT

Community engagement can assist the achievement of conservation goals by fostering an appreciation of both the issues involved (particularly the ecological, economic and social effects of land planning and land management) and of the actions required to conserve biodiversity. Community engagement is also important for accessing community knowledge and resources (for example, wildlife expertise or capacity to undertake volunteer activities). In the case of the Little Eagle, knowledge of its conservation status and threats to its future well-being in the ACT are, to a significant extent, a product of community knowledge and efforts.

### Objectives

1. The community is informed of the conservation issues regarding the Little Eagle.
2. Community based conservation activities focused on the Little Eagle continue and grow.

### Actions

1. Provide the community with information about the conservation requirements for the Little Eagle.
2. Encourage and support the continuation and further development of community based conservation activities related to the Little Eagle, particularly with regard to conservation and management of habitat.

### Indicator

There is active, well-informed and ongoing involvement of the community in the conservation of the Little Eagle.

## Socio-economic issues

Protection of Little Eagle habitat may result in land-use constraints that could affect future urban development opportunities. In particular,

the continued presence of a breeding pairs in the Molonglo Valley will require consideration of habitat protection during planning for urban development.

It is possible that the presence of Little Eagle habitat on rural leases will have economic implications in the form of land use constraints, management requirements to achieve conservation goals, or acquisition for reservation purposes. It is also possible that the presence of habitat will enable rural leases to continue, if future urban development of these areas is precluded.

For many people in the ACT, the presence of bushland and wildlife are important aspects of the Canberra urban landscape and lifestyle. There are correspondingly significant community concerns about further loss of ecological communities and their component native species in the ACT.

## Legislative provisions

The following legislation applies to the conservation of flora and fauna in the ACT:

### ACT Legislation

#### **Nature Conservation Act 1980**

The *Nature Conservation Act 1980* protects native plants and animals and the nests of native animals. It establishes the Conservator of Flora and Fauna and specified activities are controlled via a licensing system. The Conservator may give the occupier of land directions for the protection or conservation of native plants and animals on the land. The Act also provides authority for the management of public land that is reserved for conservation of the natural environment. Special measures for conservation of a species or community of concern can be introduced.

#### **Planning and Development Act 2007**

The object of this Act is to provide a planning and land system that contributes to the orderly and sustainable development of the ACT. The Act establishes the Territory Plan; provides for the identification, reservation and management of Public Land; and outlines requirements for environmental impact assessment.

#### **Heritage Act 2004**

This Act establishes a system for the recognition, registration and conservation of natural and cultural heritage places and objects. A list of these places is maintained on the ACT Heritage Register.

### **Commonwealth Legislation**

#### ***Environment Protection and Biodiversity Conservation Act 1999***

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the primary Commonwealth legislation for environment protection. Under the EPBC Act, an action will require approval from the (Commonwealth) Environment Minister if the action has, will have, or is likely to have a significant impact on a matter of national environmental significance and it is not subject to certain specified exceptions. Matters of national environmental significance are: World Heritage and National Heritage properties, Ramsar wetlands of international importance, nationally listed threatened species and ecological communities, migratory species protected under international agreements, Commonwealth marine environment and nuclear actions.

The Little Eagle is not currently a species listed under the EPBC Act. It does, however, use Yellow Box – Red Gum grassy woodland which is a component of the EPBC listed ecological community: White Box – Yellow Box – Red Gum Grassy Woodland and Derived Native Grassland (listed as critically endangered).

### **Implementation and review**

The ACT Government (Conservation Research, Environment and Sustainable Development Directorate) has responsibility for coordinating implementation of this Action Plan. Some actions will involve collaboration between government agencies, research organisations and the community.

The Flora and Fauna Committee will review implementation of this Action Plan after three years. The review will comprise an assessment of achievement of the objectives of the Action Plan, recognising that the timeframe for achieving some objectives are necessarily longer than the duration of this Action Plan. Assessment of progress will be based on achieving the relevant indicator for each Action.

The review will provide an opportunity for both the Flora and Fauna Committee and relevant section(s) of the ACT Government to assess progress; take account of new knowledge of the species and threats; consider new developments in policy and administration; and review directions and priorities for future conservation actions.

### **Acknowledgements**

Bill Logan, Murray Evans, Stephen Debus and Kevin Frawley contributed significantly to the preparation of this Action Plan. The illustration of the species (Figure 1) was prepared for the ACT Government by Leslie Wallington.

### **References**

- ACT Government 2010. ACT Woodland Restoration Implementation Plan. Unpublished report by Department of Territory and Municipal Services. Viewed 29 March 2011. <<http://fotpin.hussat.com.au/docs/woodland-restoration-implementation-plan%20.pdf>>
- Baker-Gabb DJ 1984. The breeding ecology of twelve species of diurnal raptor in north-western Victoria, *Australian Wildlife Research* 11: 145–160.
- Barrett G, Silcocks A, Barry S, Cunningham R and Poulter R 2003. *The New Atlas of Australian Birds* (Royal Australasian Ornithologists Union, Hawthorn East, Victoria).
- Barrett GW, Silcocks AF, Cunningham R, Oliver DL, Weston MA and Baker J 2007. Comparison of atlas data to determine the conservation status of bird species in New South Wales, with emphasis on woodland-dependent species, *Australian Zoology* 34: 37–77.
- Blakers M, Davies SJF, Reilly PN 1984. *The Atlas of Australian Birds* (Melbourne University Press, Melbourne).
- Bounds J 2008. Nomination of a vulnerable species to the ACT Flora and Fauna Committee: Little Eagle, *Canberra Bird Notes* 33: 84–95.
- Debus S 1998. *The Birds of Prey of Australia: A Field Guide* (Oxford University Press, Melbourne).
- Debus S 2005. Potential impacts of proposed urban development on the raptors in the

- Molonglo Valley, ACT. Unpublished report to ACT Planning and Land Authority, Canberra.
- Debus S 2008. Raptors and the proposed Central Molonglo Development, *Canberra Bird Notes* 33: 81–83.
- Debus S and Rose AB 1999. Notes on the diet of the Wedge-tailed Eagle *Aquila audax*, *Australian Bird Watcher* 18: 38–41.
- Debus SJS, Hatfield TS, Ley AJ and Rose AB 2007. Breeding Biology and Diet of the Little Eagle *Hieraetus morphnoides* in the New England Region of New South Wales, *Australian Field Ornithology* 24: 137–157.
- Debus SJS and Ley AJ 2009. Aspects of the breeding cycle of the Little Eagle *Hieraetus morphnoides*, *Australian Field Ornithology* 26: 76–99.
- DSEWPC (Department of Sustainability, Environment, Water, Population and Communities) 2011. Australia's bioregions (Australian Government, Canberra). Viewed 5 July 2011.  
<http://www.environment.gov.au>
- Ferguson-Lees J and Christie DA 2001. *Raptors of the World* (Helm, London).
- Gould J 1841. *The Zoology of the Voyage of HMS Beagle, Vol. III Birds* (London).
- Lunney D (2004) A test of our civilisation: Conserving Australia's forest fauna across a cultural landscape. In 'Conservation of Australia's Forest Fauna (2nd edn)'. (Ed. D Lunney) pp. 1-22. (Royal Zoological Society of NSW: Sydney)
- Marchant S and Higgins PJ eds. 1993. *Handbook of Australian, New Zealand and Antarctic Birds* Vol. 2 (Oxford University Press, Melbourne).
- Morgan G 2000. *Landscape Health in Australia: A rapid assessment of the relative condition of Australia's bioregions and subregions* (Environment Australia, Canberra).
- Olsen J (1992). Raptors in Namadgi, Canberra Nature Parks, the Murrumbidgee River Corridor and on the Googong Foreshore, ACT with special emphasis on the Peregrine Falcon. Report to the ACT Parks and Conservation Service.
- Olsen J and Fuentes E 2004. Preliminary report on the effect of the development of the Molonglo Valley on the community of birds of prey. Unpublished report to the ACT Government. Applied Ecology Research Group, University of Canberra.
- Olsen J and Fuentes E 2005. Collapse in numbers of breeding Little Eagles in the Australian Capital Territory, *Canberra Bird Notes* 30: 141–145.
- Olsen J, Fuentes E, Rose AB and Frost S 2006. Food and hunting of eight breeding raptors near Canberra, 1990–1994, *Australian Field Ornithology* 26: 77–95.
- Olsen J and Osgood M 2006. Numbers of breeding Little Eagles in the Australian Capital Territory in 2006, *Canberra Bird Notes* 31: 178–182.
- Olsen J, Osgood M, Maconachie M and Dabb G 2008. Numbers of breeding Little Eagles *Hieraetus morphnoides* in the Australian Capital Territory in 2007, *Canberra Bird Notes* 33: 77–80.
- Olsen J, Osgood M, Maconachie M, Dabb G and Butterfield M 2009. Numbers of breeding Little Eagles *Hieraetus morphnoides* in the Australian Capital Territory in 2008, *Canberra Bird Notes* 34: 81–85.
- Olsen J, Judge D, Fuentes E, Rose AB and Debus SJS 2010. Diets of Wedge-tailed Eagles (*Aquila audax*) and Little Eagles (*Hieraetus morphnoides*) breeding near Canberra, Australia, *Journal of Raptor Research* 44: 50–61.
- Olsen J, Osgood M, Maconachie M, Dabb G and Butterfield M 2010. Little Eagles, Whistling Kites and Swamp Harriers in the Australian Capital Territory 2009, *Canberra Bird Notes* 35: 81–84.
- Olsen J, Osgood M, Maconachie M, Dabb G and Butterfield M 2012. Little Eagles, Whistling Kites and Swamp Harriers in the Australian Capital Territory 2010, *Canberra Bird Notes* 36: 155–157.
- Olsen P, Weston M, Tzaros C, Silcocks A 2005. The State of Australia's Birds 2005: Woodlands and Birds. Supplement to *Wingspan* 15.
- Taylor McC and Canberra Ornithologists Group 1992. *Birds of the Australian Capital Territory: An Atlas* (Canberra Ornithologists Group and the National Capital Planning Authority, Canberra).

## List of Action Plans

In accordance with Section 23 of the *Nature Conservation Act 1980*, Action Plans are prepared by the Conservator of Flora and Fauna. The following are current:

No. 5: A subalpine herb (*Gentiana baeuerlenii*) —an endangered species.

No. 6: Corroboree Frog (*Pseudophryne corroboree*)—a vulnerable species.

No. 22: Brush-tailed Rock-wallaby (*Petrogale penicillata*)—an endangered species.

No. 23: Smoky Mouse (*Pseudomys fumeus*)—an endangered species.

No. 27: Woodlands for Wildlife: ACT Lowland Woodland Conservation Strategy.

Incorporating Action Plans for the following threatened species and communities:

- Yellow Box – Red Gum Grassy Woodland
- A Leek Orchid (*Prasophyllum petilum*)
- Small Purple Pea (*Swainsona recta*)
- Hooded Robin (*Melanodryas cucullata*)
- Swift Parrot (*Lathamus discolor*)
- Superb Parrot (*Polytelis swainsonii*)
- Brown Tree creeper (*Climacteris picumnus*)
- Painted Honeyeater (*Grantiella picta*)
- Regent Honeyeater (*Xanthomyza phrygia*)
- Varied Sitella (*Daphoenositta chrysoptera*)
- White-winged Triller (*Lalage sueurii*)

No. 28: A Vision Splendid of the Grassy Plains Extended: ACT Lowland Native Grassland Conservation Strategy.

Incorporating Action Plans for the following threatened species and communities:

- Natural Temperate Grassland
- Striped Legless Lizard (*Delma impar*)
- Grassland Earless Dragon (*Tympanocryptis pinguicolla*)
- Golden Sun Moth (*Synemon plana*)
- Perunga Grasshopper (*Perunga ochracea*)
- Button Wrinklewort (*Rutidosis leptorrhynchoides*)
- Ginninderra Peppercress (*Lepidium ginninderrense*)

No. 29: Ribbons of Life: ACT Aquatic Species and Riparian Zone Conservation Strategy.

Incorporating Action Plans for the following threatened species and communities:

- Two-spined Blackfish (*Gadopsis bispinosus*)
  - Trout Cod (*Maccullochella macquariensis*)
  - Macquarie Perch (*Macquaria australasica*)
  - Murray River Crayfish (*Euastacus armatus*)
  - Silver Perch (*Bidyanus bidyanus*)
  - Tuggeranong Lignum (*Muehlenbeckia tuggeranong*)
  - Pink-tailed Worm Lizard (*Aprasia parapulchella*)
- No. 30: Spotted-tailed Quoll (*Dasyurus maculatus*)—a vulnerable species.
- No. 31: Canberra Spider Orchid (*Arachnorchis actensis*) – an endangered species
- No. 32: Brindabella Midge Orchid (*Corunastylis ectopa*) – an endangered species
- No. 33: Glossy Black-cockatoo (*Calyptorhynchus lathamii*) – a vulnerable species
- No. 34: Murrumbidgee Bossiaea (*Bossiaea grayi*) – an endangered species

## FURTHER INFORMATION

Further information on this Action Plan or other threatened species and ecological communities can be obtained from:  
Conservation Research unit, Environment and Sustainable Development Directorate

Phone: (02) 132281

Environment and Sustainable Development Directorate Website:  
<http://www.esdd.act.gov.au/>

This document should be cited as:  
ACT Government 2013. Little Eagle (*Hieraetus morphnoides*). Action Plan No. 35.  
ACT Government, Canberra.