ACTION PLAN No. 23

In accordance with section 21 of the *Nature Conservation Act 1980*, the **Smoky Mouse *(Pseudomys fumeus)*** was declared an **endangered** species on 6 January 1998 (formerly Instrument No. 7 of 1998 of currently Instrument No. 192 of 1998). Section 23 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:

Smoky Mouse
Pseudomys fumeus

Preamble

The *Nature Conservation Act 1980* establishes the ACT Flora and Fauna Committee with responsibilities for assessing the conservation status of the ACT's 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 are guided by specified criteria as set out in its publication *"Threatened Species and Communities in the ACT*, July 1995".

In making its assessment of the Smoky Mouse, the Committee concluded that it satisfied the criteria indicated in the adjacent table.

An Action Plan is required in response to each declaration. It must include proposals for the identification, protection and survival of a threatened species or ecological community, or, in the case of a threatening process, proposals to minimise its effect.

This Action Plan was prepared by the Conservator of Flora and Fauna in accordance with the requirements of the Nature Conservation Act, in consultation with the Flora and Fauna Committee and after the statutory period for public comment.

While the legal authority of this Action Plan is confined to the Australian Capital Territory, management considerations are addressed in a regional context.

Criteria Satisfied

1.2	The species is observed, estimated, inferred or suspected to be at risk of premature extinction in the ACT region in the near future, as demonstrated by:
	1.2.6 Extremely small population.

Species Description and Ecology

DESCRIPTION

The Smoky Mouse *Pseudomys fumeus* (Figure 1), is a native mouse, similar in size to a small rat (Watts and Aslin 1981). It is pale grey to blue-grey to black above, with a grey to white belly (Cockburn 1995) and a ring of dark hairs around each of its large, bulging eyes (Mayo pers. comm.). The feet are pink with white fur (Cockburn 1995). The species is distinguished by its bicoloured tail, which is blue-grey dorsally, white ventrally and lightly furred (Mayo pers. comm.). The species has a head and body length of 85-100 mm (average 90 mm), a tail length of 110-145 mm (average 140 mm) and weighs between 45-90 g (average 70 g) (Cockburn 1995).

Variability in size and colour has been noted between two forms found in Victoria. The western form, known only from the Grampians is larger and darker than the eastern form (east of Melbourne) (Cockburn 1995). It appears that the specimens found in NSW are similar to the eastern form and a male trapped in the Brindabella Ranges had a pink scrotum (Osborne and Preece 1986), whereas those from the Grampians were darkly pigmented (Cockburn pers. comm.).

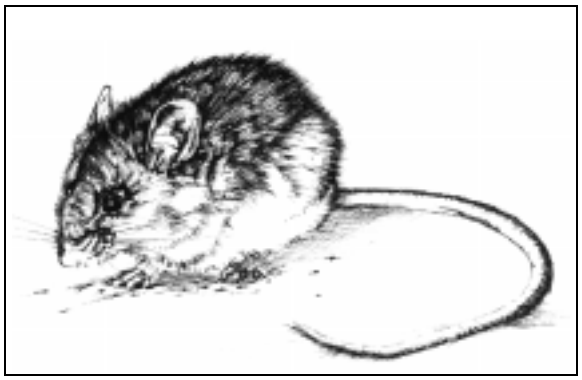

Figure 1: Smoky Mouse *Pseudomys fumeus.* Scale: approximately half natural size.

HABITAT

P. fumeus has been found in a range of vegetation types from coastal heath to heathy woodland. These range from the coast to subalpine heath and dry forest of Broad-leaved Peppermint *Eucalyptus dives* and Brittle Gum *E. mannifera*, or Mountain Gum *E. dalrympleana* and Silvertop Ash *E. delegatensis* forests, and Snow Gum (*E. pauciflora*) woodland in the subalpine regions. They also occur in fern gullies in wet forest in the Grampians (Menkhorst 1995). Surveys undertaken in eastern Victoria and south-eastern NSW (e.g. Jurskis *et al.* 1997; Ford 1998a,b; Broome *et al.* in prep.) indicate that the species' preferred habitat is ridge-top sclerophyll forest (Cockburn 1995) with a diverse understorey of heathy shrubs, especially from the families Fabaceae and Epacridaceae (Menkhorst and Seebeck 1981).

DISTRIBUTION

Former Distribution

Subfossil deposits indicate that *P. fumeus* was once widespread in south-eastern NSW, at Yarrangobilly, Marble Arch and London Bridge near Googong (Mayo pers. comm.) and in parts of eastern and western Victoria, including the Buchan district, the Grampians and near Nelson (Lee 1995).

Present Distribution

P. fumeus occurs mainly in Victoria as disjunct populations in the Grampians, coastal slopes of the Otway Ranges, Central Highlands, Barry Mountains, near Mt Cobberas and coastal east Gippsland between Marlo and Tamboon Inlet (Lee 1995). There are relatively few recent (post 1979) records from known sites in the Victorian highland areas, Mt William and coastal East Gippsland, despite extensive hair-tube surveys and carnivore scat analyses (J. Seebeck cited in Department of Conservation and Natural Resources 1996) and trapping at Mt William (A. Cockburn pers. comm.). However, a few recent (post 1995) records have been obtained from predator scats in the highland areas near West Buffalo and Mt Cobbler (N. Jones, pers. comm.) and Mt Stradbroke (Belcher 1995). One individual was found near Toombullup (January 1998), and possible hair records were obtained from Mt Beauty (April 1998) during surveys in NE Victoria (G. Newell pers. comm.).

Evidence for the species was found from hair sampling tubes in 1993 at Mt Poole in Nungatta State Forest in the Eden district of south-eastern NSW, (Broome *et al.* in prep.). In 1994, a NSW State Forests research team, trapping for potoroos in Nullica State Forest, caught the first *P. fumeus* to be trapped in NSW (Jurskis *et al.* 1997). The site is now included in South East Forests National Park (Nullica Section). More animals were trapped nearby in Nullica State Forest (C. Slade SFNSW, pers. comm.; Ford 1998a,b).

In Kosciuszko National Park hair records were obtained from the Pilot and Ravine areas, and three individuals were found dead near the Yarrangobilly Caves in October 1998 (Broome *et al.* in prep.; Ford 1998b).

In the ACT, two males have been trapped in the Brindabella Ranges in Namadgi National Park, one from Bulls Head (Osborne and Preece 1986) and one from Mt Kelly (Mayo 1987) (Figure 2). Repeated trapping surveys since this time have not resulted in any additional captures. However, further evidence has been obtained from one probable and one possible hair record from Mt Namadgi in 1994 (Broome *et al.* in prep.), and from an unconfirmed report of a trapping near Mt Coree in the 1970s (T. Macdonald pers. comm.). These findings suggest that it is highly likely that the species still occurs within and adjacent to the ACT, although probably in low densities (Broome *et al.* in prep.).

The broader distribution of records in subfossil remains indicates that the species' range has contracted significantly (DCNR 1996). Lee (1995) notes that the species probably declined prior to European settlement, and has declined further more recently due to habitat loss. The current distribution of *P. fumeus* is relictual and extremely difficult to interpret, thus it is not possible to identify any particular cause precipitating the declines (Cockburn pers. comm.).

BEHAVIOUR AND BIOLOGY

Studies undertaken on the summit of Mt William in the Grampians indicate that *P. fumeus* relies on three very distinct food sources, all of which are rich in nitrogen (Cockburn 1981a). *P. fumeus* forages for legume seeds and epacrid berries, as well as bogong moths, during summer. This was confirmed in the study of the population in the Nullica State Forest near Eden, which showed that habitat preference is directly related to a dietary preference for legume seed and epacrid fruits, also during summer months (Ford 1998a). In winter, the species switches to hypogeous (underground) truffle-like fungi that are common round the roots of certain shrubs and grasses, when few seeds are produced from the shrubs (Cockburn 1995). The spring diet of the Nullica population was shown to be dominated by fungi (Ford 1998a).

This reliance on seasonal food sources creates a nutritional crisis for *P. fumeus* during late spring. The fruiting bodies of the hypogeous fungi disappear through loss of soil moisture at a time when there are few alternative sources available until the mid-summer plant productivity flush (Cockburn 1995). Thus, the species can survive during this period only in restricted habitats where Bogong Moths are attracted to spring blossoms and new seeds are set (Cockburn 1995). However, studies on the Nullica population (Ford 1998a) indicate that decline does not appear to be linked with fungal decline, which suggests that decreased social factors or predation could well be a causal factor.

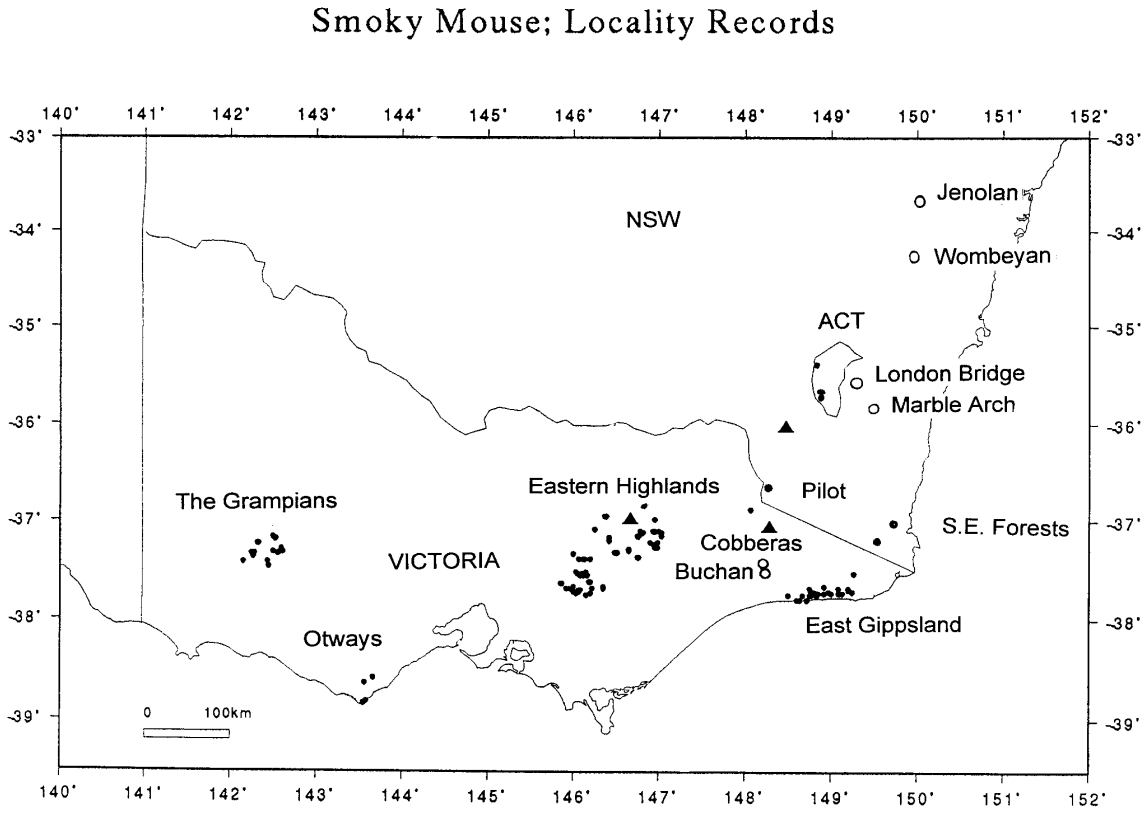

Figure 2: The distribution of *P. fumeus* in south-eastern Australia (Broome *et al.* in prep.).

- • Trapping and hair-sampling tube records.
- ▲ Predator scat records.
- o Subfossil remains.

Population Fluctuations

P. fumeus populations are subject to large annual fluctuations in abundance (Cockburn 1981b; Ford 1998a). Cockburn (1981b) attributes this to the decline in available food sources during late spring whereas Ford (1998a) indicates that the causes are unclear, but suggests that males may decline due to social conflict. Fluctuations for females are not so large because they tend to be more selective in their habitat choice and occur in higher densities in the preferred habitat which offers protection during the late spring nutritional crisis. Individuals with home ranges outside these favoured sites (more males than females) generally do not survive, although it has been suggested that they may perform an important exploratory role in colonising new areas (Cockburn 1981b).

Once breeding territories are established, breeding commences and females produce one to two litters, each of three to four young. The species has been recently discovered as being a communal plural breeder - up to five reproductive females were found co-habiting in burrows during the breeding season and a high degree of breeding synchrony was observed within nests (Ford 1998a). The females often live to breed in the second year with older ones breeding slightly earlier than the younger animals (Cockburn 1995).

This pattern of life of *P. fumeus* on Mt William in the Grampians is probably representative of the species throughout its range, given the overall similarity in habitat, which has a diverse understorey of heathy shrubs, especially legumes (Cockburn 1995). Cockburn (1995) notes that this vegetation complex is fire-generated, and suggests that the species is dependent upon post-fire succession for survival. However, the species' possible disappearance from its former stronghold in the Grampians is not, at first glance, associated with visible vegetation change, or with the disappearance or decline of any vascular plant species (Cockburn pers. comm.). This may suggest some effects on the ecology of the hypogeous fungi, which form such an important part of the species' diet (Cockburn pers. comm.).

Conservation Status

P. fumeus is recognised as a threatened species in the following sources:

International

Rare. - IUCN Red List of Threatened Animals 1994 (Groombridge 1993).

Australian Capital Territory

Endangered. - Section 21 of the *Nature Conservation Act 1980,* Instrument No. 192 of 1998 (formerly Instrument No. 7 of 1998).

Special Protection Status Species. - Schedule 7 of the *Nature Conservation Act 1980,* Instrument No. 197 of 1998.

New South Wales

Endangered. - Schedule 1 of the *Threatened Species Conservation Act 1995.*

Victoria

Vulnerable. - *Flora and Fauna Guarantee Act 1988.*

Threatening Processes

Since European settlement throughout the species' range, several major environmental changes have occurred that are likely to have seriously disadvantaged the species. These are (Lee 1995):

- **vegetation clearance**, resulting in loss of habitat and likely contraction of range;
- **inappropriate fire regimes**, resulting in changes to the floristic composition of ground and shrub vegetation - may have deleterious effects on food sources; and
- **predation** by the introduced European Red Fox (*Vulpes vulpes*) and Cat (*Felis catus*) - may be significant for small isolated populations, particularly in relation to the recent discovery of communal nesting (Ford 1998a).

When combined with the existing fragmentation of many of the remaining forest habitats, the effects of wildfires, inappropriate fire regimes and predation are all likely to exacerbate serious problems resulting from reduced dispersal, recolonisation ability and gene flow (Saunders *et al.* 1991; Fahrig and Merriam 1994). These combined effects are limiting populations to small, isolated, fire and predator refuges within the species' preferred heathy habitat (Broome *et al.* in prep.).

Major Conservation Objectives

The major conservation objective is to secure in the long term, viable, wild populations of *P. fumeus* as a component of the indigenous biological resources of the ACT region and contribute to the national conservation of the species.

This objective is to be achieved by:

- encouraging research aimed at identifying and managing the causes of population decline;
- co-operating with regional and national bodies to ensure coordination of research and monitoring programs;
- increasing awareness with land managers and the community of the need to protect the species and its habitat; and
- where appropriate, implementing any identified management action.

Conservation Issues and Intended Management Actions

Lack of knowledge on ecological requirements, particularly in relation to fire, prohibits specification of detailed management prescriptions. In the case of the Mt William population in the Grampians (which is relatively well studied), no management actions specifically aimed at the species have been undertaken (Lee 1995), although a fire management plan has been drawn up for the Otway Ranges (Lane 1997). Survey and research priorities can therefore be set (Lee 1995).

SURVEY

Following the two sightings in Namadgi National Park (NNP) in 1986 and 1987, intensive small mammal trapping efforts were directed at the two localities (Lawrence 1986; Lintermans 1988). However, no additional captures of *P. fumeus* were made. In the 1993-94 summer, an intensive hair-sampling tube survey was undertaken within predicted habitat areas in both Namadgi and Kosciuszko National Parks. From 1,354 tubes placed by the ACT Parks and Conservation Service in NNP, only one probable (from hair in a bird's nest) hair sample of *P. fumeus* was obtained at Mt Namadgi (Broome *et al.* in prep.). There were no positive identifications from hair analyses from numerous scats collected in various places throughout NNP (Mayo pers. comm.). From 1,490 tubes in Kosciuszko National Park (1994-95), one hair sample was obtained from a hair tube at The Pilot. Another was found in October 1996 from a Quoll scat at Ravine, at the northern end of the Park. Subsequent trapping surveys in the Ravine area were unsuccessful but three individuals were found dead at Yarrangobilly, most likely resulting from cat predation (Ford 1998b). Other potential sites will be surveyed as resources become available.

Research at the Nullica site in 1997-98 revealed 15 females and 13 males at the site, but numbers declined during the summer (Ford 1998a). Low numbers of individuals have been trapped at four other sites nearby in South East Forest National Park and three sites to the north in Nullica State Forest (Ford 1998b; C. Slade SFNSW, pers. comm.). These findings suggest that a metapopulation exists in the area.

Broome *et al.* (in prep.) describe the results of surveys conducted in south-eastern NSW between March 1993 and October 1998 and present predictive models of the potential distribution of the species, using all extant records from the species' entire known range until October 1998.

Due to apparent late spring die-offs (Cockburn 1981b; Ford 1998a), the optimal times for surveying populations is from late August to late September in the coastal forests and from September to November in the sub-alpine areas.

⇒ Environment ACT will follow up any new useful evidence of the species' presence within Namadgi National Park or neighbouring areas in the ACT.

⇒ Environment ACT will liaise with the NSW National Parks and Wildlife Service (NSW NPWS) to ensure coordination of efforts on a regional basis.

RESEARCH

Broome *et al.* (in prep.) have identified the urgent need for further ecological and genetic studies, and research on appropriate fire regimes. Ford (1998a) undertook a detailed study on the ecology and social organisation of the recently discovered population in south-eastern NSW to determine whether Cockburn's findings can be generalised across the range of the species. This highlighted the role of predation as a threat to the population, as does the recent find at Yarrangobilly.

⇒ Environment ACT will, through co-operation with regional efforts, support research programs which may have application for a recovery strategy for the species. Priority research projects are:

- survey of areas of known potential habitat;
- determination of appropriate fire regimes for the species' habitat; and
- effects of predation.

It is typical of the species that trap success has been very sporadic. However, ongoing monitoring through trapping, and in addition pitfall trapping at the Nullica site, will continue with an intensive predator control program by NSW agencies to see if populations do re-establish.

REQUIRED MANAGEMENT ACTIONS

- The inadequate knowledge of the habitat of this species in the ACT, and its apparent rarity, makes it difficult to specify actions other than ones already encompassed within the management of Namadgi National Park, including the Bimberi Wilderness Area. The following actions are based on the information available up to 1990 and should be reviewed as new information becomes available:
- to minimise the risk of increasing the predation pressure on the species, no fire trails or walking tracks to be constructed near areas most likely to comprise Smoky Mouse habitat, including none in the Bimberi Wilderness Area;
- continue to manage pig control programs involving poisoned wheat baits so as to avoid areas of likely Smoky Mouse habitat;
- consider the conservation requirements of this species in the preparation of the Bush Fire Fuel Management Plan covering Namadgi National Park. When, and if feasible, provide in that plan for regeneration of areas of heath. In the event of wild fires likely to burn into heath or dry sclerophyll forest on ridges, liaise with the appropriate ACT or NSW bush fire suppression authority so that heath and understorey conservation requirements are taken into account in deciding the management response to such wildfires;
- no fuel reduction burning in the Bimberi Wilderness Area. Any planned burning in possible Smoky Mouse habitat to involve monitoring of the vegetation in reference to the apparent habitat requirements of the species; and
- maintain the current level of effort to minimise the frequency of fires in Namadgi National Park that are caused by people.

Protection

All known areas of suitable and potential habitat for *P. fumeus* occur within Namadgi National Park. Therefore no further reserved areas are required.

Socio- economic Issues

There are no current activities or land uses which are likely to conflict with achievement of the conservation objective during the term of this Action Plan.

Any predator control programs implemented for the conservation of this species will be beneficial for other species and for neighbouring rural lessees. Any predator control program will be managed to minimise non-target risk, for example current baiting procedures for foxes involve burial of baits to maximise risk to the target species while minimising risk to the spotted-tailed quoll, *Dasyurus maculatus*.

⇒ Environment ACT will undertake a community consultation and public education program if its proposals for protection of the species involve land use changes.

Legislative Provisions

The following legislation is relevant to conservation of flora and fauna in the ACT region:

AUSTRALIAN CAPITAL TERRITORY

Nature Conservation Act 1980

The Nature Conservation Act provides a mechanism to encourage the protection of native plants and animals (including fish and invertebrates), the identification of threatened species and ecological communities, and the management of Public Land reserved for nature conservation purposes. Specified activities are managed via a licensing system.

Native plants and animals may be declared in recognition of a particular conservation concern and increased controls and penalties apply. Species declared as endangered must

also be declared as having special protection status (SPS), the highest level of statutory protection that can be conferred.

P. fumeus is listed as a SPS species and any activity affecting such a species is subject to special scrutiny. Conservation requirements are a paramount consideration and only activities related to conservation of the species or serving a special purpose are permissible.

The Conservator of Flora and Fauna may only grant a licence for activities affecting a species with SPS where satisfied that the act specified in the licence meets a range of stringent conditions. Further information on licensing can be obtained from the Licensing Officer, Nature Conservation Regulation, Environment ACT, telephone (02) 6207 6376.

Land (Planning and Environment) Act 1991

The Land (Planning and Environment) Act is the primary authority for land planning and administration. It establishes the Territory Plan, which identifies nature reserves, national parks and wilderness areas within the Public Land estate.

The Land (Planning and Environment) Act establishes the Heritage Places Register. Places of natural heritage significance are to be identified and conservation requirements specified.

Environmental Assessments and Inquiries may be initiated in relation to land use and development proposals.

NEW SOUTH WALES

Threatened Species Conservation Act 1995

The Act came into effect on 1 January 1996 and requires the preparation of recovery plans for endangered species (other than those presumed extinct), endangered populations, endangered ecological communities and vulnerable species. Threat abatement plans are required to manage key threatening processes with a view to their abatement, amelioration or elimination. A Species Impact Statement is required when a development application is made on land which contains areas declared to be critical habitat under Part 3 of the Act or which is likely to significantly effect threatened species, populations or ecological communities or their habitats.

The preparation of a Recovery Plan for *P. fumeus* is mandatory as the species has been listed as endangered. Predation by the European Red Fox (*Vulpes vulpes*) has been listed as a Key Threatening Process. The Final Determination was made in March 1998.

Consultation and Community Participation

It is appropriate that the conservation of *P. fumeus* and its associated heathy habitat be promoted through community liaison and public education, with the main objective being to foster protection of the species.

⇒ Environment ACT (ACT Parks and Conservation Service) will support national and regional recovery efforts.

⇒ Environment ACT (ACT Parks and Conservation Service) will encourage appropriate community participation in activities associated with the conservation of threatened species, including *P. fumeus*, in the ACT.

Implementation, Evaluation and Review

RESPONSIBILITY FOR IMPLEMENTATION

Environment ACT (Wildlife Research and Monitoring) will have responsibility for coordinating implementation of this Action Plan subject to government priorities and resources.

Actions will be implemented in consultation with regional and national recovery efforts, and will be consistent with regional programs. The ACT Parks and Conservation Service will be responsible for the on-ground implementation in areas under its control.

EVALUATION

The Action Plan will be reviewed after three years. The review will comprise an assessment of progress using the following performance indicators:

- completion of commitments that can reasonably be expected to be finalised within the review timeframe (e.g. introduction of a statutory protection measure for a species, development of a management plan);
- completion of a stage in a process with a time line that exceeds the review period (e.g. design or commencement of a research program);
- commencement of a particular commitment that is of a continuing nature (e.g. design or

commencement of a monitoring program for population abundance); and

- expert assessment of achievement of conservation objectives of the Action Plan.

The review will be reported to the ACT Flora and Fauna Committee. This will provide an opportunity for Environment ACT and the Flora and Fauna Committee to assess progress, take account of developments in nature conservation knowledge, policy and administration and review directions and priorities for future conservation action.

The following conservation actions will be given priority attention:

⇒ undertaking further survey and research work to gain a greater understanding of the distribution of the species;

⇒ development of management prescriptions to enhance the conservation status of the species, especially in regard to preferred fire regimes and predator control; and

⇒ co-operation with regional and national recovery efforts.

Acknowledgments

Linda Broome (NSW NPWS) for providing advice and oversighting successive drafts of this Action Plan.

Professor Andrew Cockburn, Head of the Division of Botany and Zoology, Australian National University, who has studied *P. fumeus* in the Grampians in western Victoria.

N. Jones, Department of Natural Resources and Environment, Victoria, who has undertaken surveys and found predator scats containing remnants of Smoky Mouse.

Garry Mayo, Division of Botany and Zoology, Australian National University, who has provided information to the ACT Flora and Fauna Committee to assist in the assessment of the species' status.

Graham Newell, senior wildlife scientist, Victorian Department of Natural Resources and Environment, who is responsible for state wide fauna surveys conducted as part of the Comprehensive Regional Assessment process.

C. Slade, ecologist, State Forests of NSW, who has undertaken surveys of Smoky Mouse.

The illustration of the species (Figure 1) was prepared for Environment ACT by Fiona Sivyer.

References

Belcher, C.A., 1995. Diet of the Tiger Quoll (*Dasyurus maculatus*) in East Gippsland, Victoria. *Wildlife Research* 22: 341-57.

Broome, L.S., Macdonald, T. & Ford, F.D., (in prep.). Surveys and predicted distribution of the Smoky Mouse *Pseudomys fumeus* (Rodentia: Muridae) in New South Wales and the Australian Capital Territory.

Cockburn, A., 1981(a). Population regulation and dispersion of the Smoky Mouse *Pseudomys fumeus*. I. Dietary determinants and microhabitat preference. *Australian Journal of Ecology* 6: 231-254.

Cockburn, A., 1981(b). Population regulation and dispersion of the Smoky Mouse *Pseudomys fumeus*. II. Spring decline, breeding success and habitat heterogeneity. *Australian Journal of Ecology* 6: 255-266.

Cockburn, A., (1995). Smoky Mouse *Pseudomys fumeus*. In Strahan, R., (ed.) *Complete Book of Australian Mammals,* pp 598-599. Angus & Robertson, Sydney.

Department of Conservation & Natural Resources (Vic), 1996. Nomination of Smoky Mouse *Pseudomys fumeus* as a threatened species under the *Flora and Fauna Guarantee Act 1988*.

Fahrig, L. & Merriam, G., 1994. Conservation of fragmented populations. *Conservation Biology* 8: 50-59.

Ford, F.D., 1998(a). *Ecology of the Smoky Mouse* (Pseudomys fumeus) *in New South Wales*. BSc Hons thesis, Division of Botany and Zoology, Australian National University.

Ford, F.D., 1998 (b). *The Smoky Mouse in the Nullica region & Kosciuszko National Park: Winter and spring 1998*. Unpublished report to the NSW NPWS Southern Zone, Queanbeyan.

Groombridge, B., (ed.), 1993. *1994 IUCN Red List of threatened animals*. IUCN Gland, Switzerland & Cambridge, UK.

Jurskis, V.P., Hudson, K.B. & Shiels, R.J., 1997. Extension of the range of Smoky Mouse *Pseudomys fumeus* (Rodentia: Muridae) into New South Wales with notes on habitat and detection methods. *Australian Forest Research* 60: 99-109.

Lane, C., 1997*. Ecological burning and the Smoky Mouse: towards a management plan.* Unpublished Grad. Dip. Project (RRM 490), Latrobe University, Bendigo.

Lawrence, J., 1986. *A survey of the Bulls Head area in the Australian Capital Territory, for*

Pseudomys fumeus. Unpublished report, Wildlife Research Unit, ACT Parks & Conservation Service, Canberra.

Lee, A.K., 1995. *The action plan for Australian rodents*. Australian Nature Conservation Agency Endangered Species Program Project No. 130. ANCA, Canberra.

Lintermans, M., 1988. *A survey of Mt Kelly for* Pseudomys fumeus. Unpublished report, Wildlife Research Unit, ACT Parks & Conservation Service, Canberra.

Mayo, G., 1987. The Smoky Mouse *Pseudomys fumeus* outside Victoria. Naturalist notes. *Victorian Naturalist* 104 No 6: 188.

Menkhorst, P.W., 1995. *Mammals of Victoria - distribution, ecology and conservation*. Department of Conservation and Natural Resources, Melbourne.

Menkhorst, P.W. & Seebeck, J.H., 1981. The distribution, habitat and status of *Pseudomys fumeus* Brazenor (Rodentia: Muridae). *Australian Wildlife Research* 8: 87-96.

Osborne, W.S. & Preece, M.A., 1986. The extension of the range of Smoky Mouse *Pseudomys fumeus* (Rodentia: Muridae) into the Australian Capital Territory. *Australian Mammalogy* 10: 35-36.

Saunders, D.A. *et al*., 1991. Biological consequences of ecosystem fragmentation: a review. *Conservation Biology* 5: 18-27.

Watts, C.H.S. & Aslin, H.J., 1981. *The rodents of Australia*. Angus & Robertson, Sydney.

List of Action Plans - October 1999

In accordance with Section 23 of the *Nature Conservation Act 1980,* the following Action Plans have been prepared by the Conservator of Flora and Fauna:

No. 1: Natural Temperate Grassland - an endangered ecological community.

No. 2: Striped Legless Lizard (*Delma impar*) - a vulnerable species.

No. 3: Eastern Lined Earless Dragon (*Tympanocryptis lineata pinguicolla*) - an endangered species.

No. 4: A leek orchid (*Prasophyllum petilum*) - an endangered species.

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

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

No. 7: Golden Sun Moth (*Synemon plana*) - an endangered species.

No. 8: Button Wrinklewort (*Rutidosis leptorrhynchoides*) - an endangered species.

No. 9: Small Purple Pea (*Swainsona recta*) - an endangered species.

No. 10: Yellow Box - Red Gum Grassy Woodland - an endangered ecological community.

No 11: Two-spined Blackfish (*Gadopsis bispinosus*) - a vulnerable species.

No. 12: Trout Cod (*Maccullochella macquariensis*) - an endangered species.

No. 13: Macquarie Perch (*Macquaria australasica*) - an endangered species.

No. 14: Murray River Crayfish (*Euastacus armatus*) - a vulnerable species.

No. 15: Hooded Robin (*Melanodryas cucullata*) - a vulnerable species.

No. 16: Swift Parrot (*Lathamus discolor*) - a vulnerable species.

No. 17: Superb Parrot (*Polytelis swainsonii*) - a vulnerable species.

No. 18: Brown Treecreeper (*Climacteris picumnus*) - a vulnerable species.

No. 19: Painted Honeyeater (*Grantiella picta*) - a vulnerable species.

No. 20: Regent Honeyeater (*Xanthomyza phrygia*) - an endangered species.

No. 21: Perunga Grasshopper (*Perunga ochracea*) - a vulnerable species.

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

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

No. 24: Tuggeranong Lignum (*Muehlenbeckia tuggeranong)* - an endangered species.

FURTHER INFORMATION

Further information on this Action Plan or other threatened species and ecological communities can be obtained from:

Environment ACT
(Wildlife Research and Monitoring)
Phone: (02) 6207 2126
Fax: (02) 6207 2122

Environment ACT Homepage:
http://www.act.gov.au/environ

This document should be cited as:

ACT Government, 1999. *Smoky Mouse* (Pseudomys fumeus): *An endangered species*. Action Plan No. 23. Environment ACT, Canberra.