Advice to the Minister for the Environment and Heritage from the Threatened Species Scientific Committee (the Committee) on Amendments to the List of Key Threatening Processes under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

1. Name and description of the threatening process

Name

'Predation by exotic rats on Australian offshore islands of less than 1000 km^2 (100,000 ha)'

Exotic Rats Description

The Black Rat (*Rattus rattus*), the Brown Rat (*Rattus norvegicus*) and the Pacific Rat (*Rattus exulans*) are introduced exotic species that inhabit many of Australia's offshore islands. The Black Rat is the most widespread of the three exotic rat species and all are recognised predators of Australian native species. Populations of these three rat species have been recorded on at least 95 Australian offshore islands of less than 1000 km^2.

Black Rat Ecology and Distribution

The Black Rat is slender with large hairless ears. It usually has a grey to light brown back with a similarly coloured or creamish-white belly; it can also be black all over. The average size of an adult Black Rat is between 120 and 160 g, but some individuals can weigh in excess of 200 g. Black Rats are active throughout the year and do not hibernate. They are predominately nocturnal, although they may be active during the day in cool weather. They have an average litter size of five to eight young and a life span of approximately two years. Black Rats can utilise most habitats, but show a preference for drier habitats. They generally avoid swimming but climb well and may frequent treetops searching for food, or building nests in leaves and branches.

The Black Rat is native to India and has proven to be a highly effective invader of new ecosystems with its distribution now extending to at least 28 island groups in the Pacific. The Black Rat was introduced to Australia in the late 1800s from shipwrecks and the pearling industry, which made extensive use of island bays for camping and mooring vessels (Morris 2002). The Black Rat was nominated by the World Conservation Union (IUCN) as among 100 of the "Worlds Worst" invaders (Veitch 2005).

Brown Rat Ecology and Distribution

The Brown Rat is moderately large with a brown back and a pale grey belly. The average size of an adult is between 150 and 300 g, but some individuals can weigh up to 500 g. Brown Rats are mainly nocturnal and are active throughout the year. They have an average litter size of six to eleven young but can produce litters of up to 18 young. Brown Rats can utilise most habitats but show a preference for wetlands. They are good swimmers and are commonly found at ground level or below, in cellars or sewers.

The Brown Rat is believed to be native to Northeast China. It has spread to Europe, Asia Minor, North and Coastal South America, Africa and Australia. It is also established on many oceanic

islands from the tropics to the polar regions. Brown Rats are often transported by ship and their tendency to live near wharves increases the likelihood of this occurring (McClelland 2005).

Pacific Rat Ecology and Distribution

The Pacific Rat has a slender body with a pointed snout and large ears. It has a brown back and a whitish belly and the average size of an adult is between 40 and 80 g. Pacific Rats are mainly nocturnal, but can become active just before dark. They have litters of four to nine young and an average of three litters per year. They have a life span of approximately 12 to 15 months. Pacific Rats can live in a wide range of habitats including grassland, scrub and forest but require adequate food supplies and shelter, especially in temperate latitudes. They can climb trees easily but are not good swimmers.

The Pacific Rat is native to Southeast Asia but has dispersed across the western and central Pacific. They occur from the Asiatic mainland south to Australia and New Zealand, and east to the Hawaiian Islands and Easter Island.

Summary of the Threatening Process

Exotic rats are opportunistic feeders; their diet at any one time generally reflects the availability of food in their environment. They eat both plant and animal matter all year round and are able to utilise a diverse range of food sources to facilitate colonisation of different environments. They are known to prey primarily on birds, small mammals, tortoises, lizards, large insects, land molluscs and plant seeds and seedlings.

The impact of exotic rats on island biodiversity has been widely documented (Recher and Clark 1974, Atkinson 1985, Garnett and Crowley 2000, Saunders and Brown 2001). Black Rats are known to have caused extinctions on islands in New Zealand and the Hawaiian group. There is considerable concern over the impact of exotic rats on Australian native species through predation. They may also have an indirect impact on the abundance of other native predators, through competition.

Predation

Exotic rats have caused or contributed to the extinction of a number of Australian native bird species by preying on their eggs and young chicks. Some birds are more vulnerable than others to this threat and can include small endemic land birds not previously exposed to native mammalian predators. Birds that nest on or near the ground, in burrows, or in tree cavities are also at a higher risk of predation (Atkinson 1985). On Lord Howe Island, exotic rats have been implicated in the extinction of five endemic forest bird species, the Island Thrush, the Robust White-eye, The Lord Howe Island Gerygone, the Tasman Starling and the Grey Fantail (Hindwood 1940 in Recher and Clark 1974). On Norfolk Island, exotic rats caused extinctions of the Grey-headed Blackbird, Norfolk Island Long-tailed Triller and White-chested White-eye (Garnett and Crowley 2000). There have been accounts of exotic rats adversely impacting bird species on Macquarie Island, Cocos Keeling Islands and Bedout Island (Garnett and Crowley 2000, Morris 2002). Exotic rats have also been implicated in the decline of a number of native mammals, lizards and insects through predation (Recher and Clark 1974, Cogger et al. 1993, Burbidge and Manly 2002).

Exotic rats also feed on the seeds of native vegetation. When rat numbers are high, they are capable of modifying the composition of native plant species in a particular area, through seed removal. In isolated patches of remnant vegetation, the removal of seeds by exotic rats may be a threat to the survival of the plant species concerned (Caughley 1996). There is evidence that rats have damaged plants on Lord Howe Island through feeding on vegetative parts and depleting seed yields (Saunders and Brown 2001).

In addition to their impacts as predators, exotic rats may also compete with native species. This competitive interaction may further impact some native species as they compete for limited food resources.

Predator Abundance

Exotic rats may also have an indirect effect on island biodiversity by providing a food source to large predators such as cats or birds of prey. This can increase the number of predators which in turn increases the predation pressure on other native species (Atkinson 1985). For example, exotic rats may have contributed indirectly to the extinction of two mammal species on the Montebello Islands, by providing an additional food source for feral cats.

Australian Offshore Islands Less than 1000 km^2

Many Australian offshore islands have high conservation values as they support a range of endemic species, often not found on mainland Australia. Their plants and animals often originate by chance dispersal over vast distances of ocean and in isolation from other populations; are subject to different evolutionary pressures; and may evolve into unique, or endemic, island forms. Plants and animals that have evolved in an island ecosystem are often quite vulnerable to extinction.

Established populations of exotic rats are known to exist on many Australian offshore islands. The presence of exotic rats on Australian offshore islands can have a more significant impact than on mainland Australia, due to the unique biodiversity and vulnerability of these island ecosystems.

The majority of Australia's offshore islands are less than 1000 km^2 (100,000 ha). Eradication or control of rats on larger Australian offshore islands can be more problematic, due to the larger ground area that would need to be covered and the feasibility of quarantine and monitoring procedures.

While this key threatening process has been limited to islands less than 1000 km^2 (100,000 ha), a Threat Abatement Plan may identify actions that may also be relevant and appropriate to islands larger than 1000 km^2.

2. How judged by the Committee in relation to the EPBC Act criteria

Section 188(4) of the EPBC Act states:

A threatening process is eligible to be treated as a key threatening process if:

a) it could cause a native species or an ecological community to become eligible for listing

in any category, other than conservation dependent; or

b) it could cause a listed threatened species or a listed threatened ecological community to become eligible to be listed in another category representing a higher degree of endangerment; or

c) it adversely affects 2 or more listed threatened species (other than conservation dependent species) or 2 or more listed threatened ecological communities.

A. Could the threatening process cause a native species or an ecological community to become eligible for listing as Extinct, Extinct in the Wild, Critically Endangered, Endangered or Vulnerable?

Three species have been selected to demonstrate that this threatening process could cause a native species to become eligible for listing as threatened. These species are:

- Grey-headed Blackbird**,** *Turdus poliocephalus poliocephalus*;
- Norfolk Island Long-tailed Triller, *Lalage leucopyga leucopyga*; and
- Lord Howe Island Wood-Feeding Cockroach, *Panesthia lata.*

Grey Headed Blackbird and Norfolk Island Long-tailed Triller

The Grey-headed Blackbird and Norfolk Island Long-tailed Triller were endemic to Norfolk Island. The Norfolk Island Long-tailed Triller was abundant in 1941, but has not been recorded since 1942 (Schodde et al. 1983). The Grey-headed Blackbird was presumed to have become extinct in the 1970s (Garnett and Crowley 2000).

The principle reason for decline of the Grey-headed Blackbird and Norfolk Island Long-tailed Triller is predation by the Black Rat (Robinson 1988). Black Rats were introduced to Norfolk Island in the 1940s (Robinson 1988). Both species are listed as extinct under the EPBC Act.

Therefore it is concluded that predation by exotic rats has caused the Grey-headed Blackbird and Norfolk Island Long-tailed Triller to be eligible for listing as extinct under the EPBC Act.

Lord Howe Island Wood-Feeding Cockroach

The Lord Howe Island Wood-Feeding Cockroach is endemic to the Lord Howe Island group. It is now extinct on the main Island, but is known to survive on smaller offshore islands. In 2003, individuals were collected on Blackburn Island and Roach Island which are part of the Lord Howe Island Permanent Park Preserve (NSW SC 2004).

The extinction of the Lord Howe Island Wood-Feeding Cockroach on the main island of Lord Howe is probably due to exotic rats (NSW SC 2004). Black Rats were accidentally introduced to Lord Howe in 1918, and were widespread by the 1920s. Exotic rats are not currently present on either Blackburn or Roach Islands but could be introduced accidentally to Blackburn Island via small boat traffic. Other identified threats to the Lord Howe Island Wood-Feeding Cockroach are habitat loss, fire and exotic grasses, which restrict dispersal of the species (NSW SC 2004).

The Lord Howe Island Wood-Feeding Cockroach has undergone a reduction in population numbers since the introduction of exotic rats on the Island. It is difficult to determine the extent of this population decline as there are no data available on the original population size or distribution. Unpublished information indicates the species may have been previously widespread. The species' geographic distribution is now restricted to two smaller islands in the Lord Howe group and unpublished information suggests that the total number of recorded individuals is extremely low (NSW SC 2004).

Therefore it is concluded that predation by exotic rats could cause the Lord Howe Island Wood-Feeding Cockroach to become eligible for listing as threatened under the EPBC Act.

Other species

It is likely that exotic rats have had, and are continuing to have, adverse impacts on a number of native species including ground-nesting seabirds, reptiles and molluscs. It is possible that these species could become eligible for listing as threatened under the EPBC Act as a result of this threatening process. There is however, insufficient data to quantify such impacts on individual species.

Conclusion for criterion A: The Committee considers that the threatening process is **eligible** under this criterion as the process has caused a native species, the Grey-headed Blackbird and the Norfolk Island Long-tailed Triller, to become eligible for listing as extinct. It also could cause a native species, the Lord Howe Island Wood-Feeding Cockroach, to become eligible for listing as threatened under the EPBC Act.

The assessment against criteria B and C are presented together as the available evidence for both criterion are similar.

B. Could the threatening process cause a listed threatened species or a listed threatened ecological community to become eligible to be listed in another category representing a higher degree of endangerment?

C. Does the threatening process adversely affect two or more listed threatened species (other than conservation dependent species) or two or more listed threatened ecological communities?

Seven species listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* have been selected to demonstrate the impact of exotic rats on Australian native species. These species are:

- Norfolk Island Green Parrot, *Cyanoramphus novaezelandiae cookie*;
- Lord Howe Flax Snail, *Placostylus bivaricosus*;
- Lord Howe Island Gecko, *Chritinus guentheri*;
- Lord Howe Island Phasmid, *Dryococelus australis*;
- Norfolk Island Golden Whistler, *Pachycephala pectoralis xanthoprocta;*
- Norfolk Island Scarlet Robin, *Petroica multicolor multicolour;* and

- Cocos Buff-banded Rail, *Gallirallus philippensis andrewsi.*

Norfolk Island Green Parrot

The Norfolk Island Green Parrot is currently listed as endangered under the EPBC Act. It is known from one location on Norfolk Island where it is largely restricted to natural or semi-natural forests. Most of this habitat is found in the Norfolk Island National Park which encompasses 455 ha (12% of the Island).

The total population of the Norfolk Island Green Parrot is estimated to be 160 individuals, with 14 known breeding pairs. An estimated 190 breeding pairs were present on the Island before European settlement (Hill 2002). Population numbers are primarily limited by the availability of suitable habitat, including predator-free breeding areas and nesting sites (Hill 2002). The Norfolk Island Green Parrot's breeding range is restricted to the National Park and natural nest sites occur only in hollows of native tree species, typically within two metres of the ground (Hicks and Preece 1991).

Predation by introduced predators and habitat loss are the primary factors responsible for the decline of the Norfolk Island Green Parrot. The Recovery Plan for the Norfolk Island Green Parrot identifies predation by the Black Rat as one of the greatest threats to the species (Hill 2002). Rats eat eggs and nestlings and prey on brooding females. Predation by Black Rats was identified as the cause behind six of fifteen failed wild Norfolk Island Green Parrot nests between 1983 and 1991 (Hicks and Preece 1991). This was also the cause of at least two of eighteen failed clutches in 1996 (unpublished data in Hill 2002). A study into Norfolk Island Green Parrot numbers and breeding output undertaken in 1995 indicated that population numbers and breeding attempts had increased since rat baiting commenced (Innes 1995 in Hill 2002).

Assessment against criterion B: Exotic rats prey on Norfolk Island Green Parrot eggs, chicks and brooding females and can cause nest failures. These impacts are likely to result in significant reductions in already low population numbers. Therefore, this threatening process could cause the species to become eligible for listing as critically endangered under the EPBC Act.

Assessment against criterion C: As exotic rats are a major predator of the Norfolk Island Green Parrot and there is documented evidence of their adverse impact on breeding success, it is concluded that this threatening process is adversely affecting the Norfolk Island Green Parrot.

Lord Howe Flax Snail

The Lord Howe Flax Snail is currently listed as endangered under the EPBC Act. It is endemic to Lord Howe Island and was formerly widespread and common on the Island but has since declined significantly in range and abundance. The species is restricted to 2 locations, the Settlement Area in the mid-island lowlands and around North Bay. An indication of the previous widespread abundance of the Lord Howe Flax Snail in the mid-island lowlands is readily observable in the form of dead shells of the species, which occur in densities of up to 30 shells/m^2 in many parts of the Settlement Area (Ponder and Chapman 1999). The total current population is estimated to be less then 1000 mature individuals.

The Recovery Plan for the Lord Howe Placostylus (Flax Snail) identifies habitat clearing and modification and predation and habitat disturbance by exotic vertebrate fauna (predominantly the

Black Rat) as major causes of the species decline (NSW NPWS 2001). Rats are known to prey extensively on the Lord Howe Flax Snail, particularly on juvenile snails and are a major predator to the species and a significant threat to its survival (Ponder and Chapman 1999, TSSC 2005).

All surviving Lord Howe Flax Snail populations are subject to major levels of exotic rat predation, with rats having 100% spatial overlap with the current distribution of the snail. Some protection is provided in areas where rodent baiting is undertaken. Unpublished data indicates that uncontrolled rat predation can suppress snail population levels to approximately a tenth of their potential. Research on New Zealand *Placostylus* (Flax Snail) species has demonstrated that control of rats by pulse baiting can significantly increase adult snail recruitment (Sherley et al. 1998).

Assessment against criterion B: Exotic rats are a major predator of the Lord Howe Flax Snail and are found throughout the species' current distribution. The impact of predation is likely to result in significant reductions in population numbers. Therefore, this threatening process could cause the species to become eligible for listing as critically endangered under the EPBC Act.

Assessment against criterion C: As exotic rats are a major predator of the Lord Howe Flax Snail and the rat population on Lord Howe remains considerable, it is concluded that this threatening process is adversely affecting the Lord Howe Flax Snail.

Lord Howe Island Gecko

The Lord Howe Island Gecko is currently listed as vulnerable under the EPBC Act. On Lord Howe Island the species underwent a large decline in population numbers following the introduction of Black Rats in 1918 and is now restricted to a small area near the main settlement. It is also found on Blackburn Island, Roach Island and on Ball's Pyramid. The species appears to be extinct on the mainland of Norfolk Island, but still occurs on Phillip and Nepean Island and at least two small rocky islets adjacent to Norfolk Island (Cogger et al 1993).

The cause of population decline of the Lord Howe Island Gecko on Lord Howe Island is almost certainly due to the introduction of the Black Rat (Cogger et al 1993). The reason for the population decline on Norfolk Island is generally accepted as the introduction of the Pacific Rat, which was introduced to the Island about 900 years ago (Cogger et al 1993). These conclusions are supported by the fact that the species is more abundant on small islands where exotic rats are absent (NSW DEC 2005). The impact of exotic rats on the Lord Howe Island Gecko is likely to be through predation of gecko eggs.

The draft Biodiversity Management Plan for Lord Howe Island recommends that the feasibility of rodent eradication continue to be investigated (NSW DEC 2005).

Assessment against criterion B: Predation by exotic rats is likely to be the main reason for the decline of the Lord Howe Island Gecko on Lord Howe Island and Norfolk Island. However there is no quantitative data available on their impact. Therefore, there is insufficient evidence to determine whether this threatening process alone could cause the Lord Howe Island Gecko to become eligible to be listed in a category representing a higher degree of endangerment.

Assessment against criterion C: Predation by exotic rats is likely to be the main reason for the decline of the Lord Howe Island Gecko on Lord Howe Island and Norfolk Island. It is concluded that this threatening process is adversely affecting this species.

Lord Howe Island Phasmid

The Lord Howe Island Phasmid is currently listed as critically endangered under the EPBC Act. It was previously abundant on Lord Howe Island but became extinct after rats were introduced to the Island in 1918. Rats probably ate the eggs and young nymphs rather than the adults (TSSC 2002). In 2001, the Lord Howe Island Phasmid was discovered on Balls Pyramid, a rocky volcanic stack 23 km south-east of Lord Howe Island. The size of this remaining population is not known, but experts estimate that the number of mature individuals is unlikely to exceed 10 individuals (TSSC 2002). No exotic rats are present on Balls Pyramid.

The population of the Lord Howe Island Phasmid currently on Balls Pyramid is threatened by collection, human disturbance, weed invasion and the possible introduction of rats (TSSC 2002). Although the likelihood of exotic rat introduction is not known, it is likely that rats would have a significant impact on this restricted population. Exotic rats are also adversely affecting the Phasmid population by preventing the re-introduction of the species to Lord Howe Island. While rats are present on the Island it is not feasible to release individuals and restore the population.

Assessment against criterion B: The introduction of exotic rats on Balls Pyramid is likely to cause the Lord Howe Island Phasmid to become extinct in the wild. However, the probability of this introduction is not known. Therefore, there are insufficient quantitative data to determine whether this threatening process alone could cause the Lord Howe Island Phasmid to become eligible to be listed in a category representing a higher degree of endangerment.

Assessment against criterion C: The presence of exotic rats on Lord Howe Island is preventing the re-introduction of the Lord Howe Island Phasmid from Balls Pyramid to Lord Howe Island. The species is restricted to a single location where the number of individuals is likely to be very low. It is concluded that this threatening process is adversely affecting the Lord Howe Island Phasmid.

Norfolk Island Golden Whistler and Norfolk Island Scarlet Robin

The Norfolk Island Golden Whistler and Norfolk Island Scarlet Robin are listed as vulnerable under the EPBC Act. Although once found throughout the forests of Norfolk Island, and on Phillip Island 6km to the south, both species are now restricted to a single population in Norfolk Island National Park (Commonwealth 2005a).

There are an estimated 440 breeding pairs of Norfolk Island Scarlet Robins and 535 breeding pairs of Norfolk Island Golden Whistlers. Populations of both species began declining in the 1960s and are primarily limited by the small area of remaining suitable habitat, habitat

fragmentation, habitat degradation and weed infestation, and introduced predators such as feral cats and Black Rats (Commonwealth 2005a).

The recovery plan for the two species states that Black Rats and feral cats continue to be the greatest threat to Norfolk Island's native vertebrate fauna. The major reason for population declines of the Norfolk Island Golden Whistler and Norfolk Island Scarlet Robin is likely to be predation by Black Rats (Garnett and Crowley 2000). Recovery actions for both species include control of Black Rats (Commonwealth 2005a).

Assessment against criterion B: Rats are a major predator of the Norfolk Island Golden Whistler and Norfolk Island Scarlet Robin, however there is no quantitative data available on their impact. Therefore, there is insufficient evidence to determine whether this threatening process alone could cause either species to become eligible to be listed in a category representing a higher degree of endangerment.

Assessment against criterion C: Exotic rats are a major predator of the Norfolk Island Golden Whistler and the Norfolk Island Scarlet Robin and both species are limited in population numbers and geographic distribution. Therefore it is concluded that this threatening process is adversely affecting both species.

Cocos Buff-banded Rail

The Cocos Buff-banded Rail is currently listed as endangered under the EPBC Act. The species was widespread and common until the early 1900s on all islands of the Cocos-Keeling group, but is now confined to North Keeling Island. Threats to the species include loss of habitat and predation by feral cats and Black Rats (Commonwealth, 2005b).

The threats posed by exotic rats include the predation of the species' eggs and chicks, and the potential for Black Rats to act as a competitor with the species for invertebrate food. Although there is currently no direct evidence that rats prey on the Cocos Buff-banded Rail, they are known to prey on the eggs and chicks of a wide range of smaller seabirds and land birds, and particularly on rails on isolated islands (Steadman & Martin 2003 in Commonwealth 2005b). Therefore they are considered a threat to the species and a likely cause of population declines, when the species was more widespread on islands of the Cocos-Keeling group.

Exotic rats are present on most islands of the Southern Atoll, but are not currently on North Keeling Island. The Action Plan for Australian Birds states that the greatest threat now to the Cocos Buff-banded Rail is the possible, accidental introduction of predators to North Keeling Island (Garnnett and Crowley 2000). Recommendations under this Action Plan include the eradication of rats from any Southern Atoll island where the reintroduction of the Cocos Buff-banded Rail is proposed.

Assessment against criterion B: Rats are thought to prey on the Cocos Buff-banded Rail however there is no quantitative data available on their impact. Therefore, there is insufficient evidence to determine whether this threatening process alone could cause the species to become eligible to be listed in a category representing a higher degree of endangerment.

Assessment against criterion C: Although there is no direct evidence of rat predation on the Cocos Buff-banded Rail, exotic rats are known to predate on similar species, in particular, rails on isolated islands. Therefore exotic rats are considered a threat to this species and a likely cause of population declines. The presence of exotic rats on islands of the Southern Atoll is restricting the distribution of the Cocos Buff-banded Rail by preventing re-introduction to these islands. It is concluded that this threatening process is adversely affecting the Cocos Buff-banded Rail.

Conclusion for criterion B: The Committee considers that the threatening process is **eligible** under this criterion as the process is likely to cause at least two species, the Norfolk Island Green Parrot (*Cyanoramphus novaezelandiae cookie*) and the Lord Howe Flax Snail (*Placostylus bivaricosus*) to become eligible to be listed as critically endangered, which represents a higher degree of endangerment.

Conclusion for criterion C: The Committee considers that the threatening process is **eligible** under this criterion as the process is adversely affecting at least seven listed threatened species, primarily through predation of eggs and young:

- Norfolk Island Green Parrot (*Cyanoramphus novaezelandiae cookie*) - endangered
- Lord Howe Flax Snail (*Placostylus bivaricosus*) - endangered
- Lord Howe Island Gecko (*Chritinus guentheri*) - vulnerable
- Lord Howe Island Phasmid, *Dryococelus australis*) - critically endangered
- Norfolk Island Golden Whistler (*Pachycephala pectoralis xanthoprocta*) - vulnerable
- Norfolk Island Scarlet Robin (*Petroica multicolor multicolour*) - vulnerable
- Cocos Buff-banded Rail (*Gallirallus philippensis andrewsi*) - endangered

CONCLUSION: The threatening process meets s188(4)(a), s188(4)(b) and s188(4)(c) of the *EPBC Act*, and is **eligible** to be listed as a key threatening process.

3. Threat Abatement Plan

Since the 1970s exotic rodents have been eradicated from more than 100 islands worldwide (Saunders and Brown 2001). Exotic rats have been eradicated from more than 31 islands offshore of Western Australia since 1981 (Burbidge and Morris 2002). This work included the development of an effective method for eradicating exotic rats in the presence of native mammal species. Recent work on eradicating rats from the Montebello Islands in Western Australia appears to have also been successful.

Where feasible, eradication, as opposed to control, is the desirable outcome for reducing the impact of exotic rats as it has proven to be more effective in terms of cost and outcomes. Methods to prevent introduction should be also considered for islands where rats are not yet present, or have previously been eradicated. This should include stringent quarantine and monitoring procedures.

Islands provide a good environment for exotic rat eradication as:

- they are relatively small and contained areas,
- they often have a limited number of invasive species,

- barriers to prevent re-introduction can be developed via quarantine and education, and
- techniques and lessons learnt can be applied to larger continental areas.

Current Threat Abatement Strategies

A number of initiatives are already in place to address the threat posed by exotic rats on islands; these are instructive when considering the need for a national Threat Abatement Plan.

- **Lord Howe Island:** A rodent control program is currently in place. The program is aimed at protecting the Kentia palm industry by reducing rat predation on Kentia palm seed. This program has also been modified to provide some benefits to the Lord Howe Flax Snail; however the program only covers 10% of the Island. In 2001, an assessment was undertaken on the feasibility of eradicating rodents from Lord Howe Island. The study found that it was technically feasible but risks such as impacts on non-target mammal species, would need to be managed effectively (Saunders and Brown 2001). 'Predation by the Ship Rat *Rattus rattus* on Lord Howe Island' is listed as a key threatening process under the *New South Wales Threatened Species Conservation Act 1995*. The NSW Scientific Committee recommended that a Threat Abatement Plan which augments the existing rat control program, be developed.

- **Norfolk Island**: A rodent control program has been implemented within the boundaries of the Norfolk Island National Park. The Action Plan for Australian Birds and the Recovery Plan for the Norfolk Island Green Parrot include recommendations for rat management activities on Norfolk Island.

- **Cocos Keeling Island:** The draft recovery plan for the Cocos Buff-banded Rail includes the development of a program for the reintroduction of the species to the Southern Atoll. As part of this reintroduction program, it is recommended that rats are completely eradicated from any Southern Atoll island targeted for reintroduction (Commonwealth 2005).

- **Macquarie Island:** The eradication of rabbits, rats and mice from the Macquarie Island Nature Reserve and World Heritage Area has been identified as the highest management priority for the reserve. The Recovery Plan for Albatrosses and Giant-petrels identifies a rodent eradication plan for the Island (Environment Australia 2001).

Need for a National Approach

The threat abatement initiatives outlined above are aimed at mitigating impacts for a specific species or in a specific island group. However these actions only cover a small proportion of Australia's offshore islands. A national approach could provide coordination for current and future activities related to controlling the impacts of exotic rats.

Development of a Threat Abatement Plan could complement existing activities for exotic rat control, including those documented above. The Bureau of Rural Sciences publication '*Managing Vertebrate Pests: Rodents*' provides detailed information on abating the impact of rodents on native species**.** These include poisoning, making the environment less sympathetic to

rodents, trapping, and the best overall method of controlling rodents - a combination of various approaches. This publication should be considered in the development of a Threat Abatement Plan.

Key features of a Threat Abatement Plan could include:

- Prioritisation of islands for threat abatement and prevention;
- Feasibility studies on an individual island basis to determine whether eradication is feasible without significant adverse impacts to native wildlife;
- Cost benefit studies to examine the cost-effectiveness of eradication and quarantine;
- Community education and support; and
- Quarantine and contingency planning to prevent and control reintroduction.

CONCLUSION: The Committee considers a Threat Abatement Plan to be a feasible, effective and efficient way to abate the process (at this time) as it could assist in coordination of existing information and actions.

4. Recommendations

A. The Committee recommends that the list referred to in section 183 of the EPBC Act be amended by **including** in the list as a **key threatening process**: **'Predation by exotic rats on Australian offshore islands of less than 1000 km^2 (100,000 ha)'.**

B. The Committee recommends that a Threat Abatement Plan is considered a feasible, efficient, and effective way to abate the process (at this time).

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Chair
Threatened Species Scientific Committee

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