

POSTERS

The Australian Pest Animal Strategy

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Activities aimed at reducing the economic, environmental and social impacts of pest animals are a significant part of wildlife management in Australia. The Australian Pest Animal Strategy (APAS) was developed by the national Vertebrate Pests Committee (VPC), a multi-jurisdictional body that has responsibility for developing national pest management strategies and policies. The APAS now provides a framework plan for pest management activities that is endorsed by all Australian governments. It sets out how the governments will work with each other, and with business, industry and the community to manage the issues and problems associated with vertebrate pest animals in Australia. In its most basic terms, the APAS aims to help prevent the introduction and spread of new pest animals, manage the impact of those that are already established, and assist the cooperation between jurisdictions and agencies that is required to achieve these goals. The APAS has also established a series of principles, objectives and actions that are intended to deliver broad national outcomes congruent with these goals. Further details about the APAS, together with full text of the APAS document, are available at www.apas.net.au.

Processes Threatening the Continued Survival of the Critically Endangered Helmeted Honeyeater (*Lichenostomus melanops cassidix*).

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The Helmeted Honeyeater is a prime candidate for studying a complex endangered species management system, as it involves many facets of management, captive breeding, re-introductions and translocations. Despite an active recovery program spanning more than 20 years, Helmeted Honeyeater numbers have not increased significantly. It is imperative that we better understand the factors that may be limiting the recovery of this species. I am undertaking a comprehensive study of the Helmeted Honeyeater to assist in the management decisions for this species' recovery. My research is utilising microsatellite and functional genetic techniques to understand the current genetic diversity of Helmeted Honeyeaters and compare this to historic genetic diversity. This will facilitate management decisions for the captive breeding program, to maximise future genetic diversity across the species. I am also investigating how individual Helmeted Honeyeaters respond to predation threats. This information will assist in developing predator-related strategies to maximise the success of the wild populations. Results will gauge any variation between captive and wild birds in their responsiveness to predation threats, and therefore ascertain whether captive-bred birds released into the wild may benefit from interventions such as a pre-release predator awareness training program to increase their chances of survival in the wild.

Enabling strategic feral cat control on Kangaroo Island

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Feral cats pose a threat to endangered species on Kangaroo Island, and have substantial economic impacts on the Island's primary producers. Effective cat management requires a strategic approach, informed by the ecology and

impacts of the cats, as well as community expectations. We identified four key requirements necessary to support existing knowledge and enable the development of strategic feral cat management on the Island:

- effective and target-specific control tools;
- information on temporal and spatial variation in landscape use by feral cats;
- identification of biologically relevant management units; and
- a reliable method for estimating cat abundance.

The aim of this study is to collect the information necessary to complete these existing knowledge gaps. We describe our methods, preliminary results and likely implications for the development of effective cat control strategies and tactics for Kangaroo Island.

The effect of deslorelin on the fertility of free-ranging female koalas (*Phascolarctos cinereus*) in two Victorian populations

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We investigated the use of a long acting GnRH agonist (4.7 mg deslorelin implants) for the non-lethal control of high density koala populations in Victoria. We tested these in free-ranging female koalas from two populations, one with and one without chlamydial infection. Deslorelin or placebo implants were inserted subcutaneously before the breeding season. Treated females were radio-collared to facilitate monitoring, and caught periodically to assess reproductive status. After a single treatment with deslorelin, females were not observed with a pouch young for between 338 days and 776 days. Fertility was decreased by 90–100% in both populations when females were treated annually over the three years of the study. In addition, there was extended duration of contraceptive effect in the annually treated group, with 0% fertility during the second season after final treatment. A small proportion of treated females did give birth. However, most of these lost their young within three months post-partum and only one reared her young to maturity. Our data show that deslorelin can provide effective control of fertility in female koalas, for at least one breeding season. These implants may therefore have value in management programs for this species in the wild.

The effect of ship rat suppression and food supplementation on house mice in Pureora Forest Park

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Ship rats (*Rattus rattus*) are hypothesised to cause low house mouse (*Mus musculus*) abundance in New Zealand podocarp-broadleaf forest. Evidence comes from increased mouse detection rates observed when rats are controlled. The mechanism may be competition for food, or aggression. Mice may increase in abundance through improved survival and/or recruitment or they may increase in detectability. To investigate we used live-traps and tracking tunnels on grids to monitor mice following rat poisoning in Pureora Forest Park, and also carried out mouse specific food supplementation. More mice were live-trapped on rat control grids compared to non-treatment grids, notably in autumn, but capture probabilities were similar. Abundance indices from tracking tunnels showed similar trends to trapping. Higher mouse abundance on rat control grids in autumn seemed to be due to juvenile recruitment and adult immigration. Supplemented food did not influence mouse abundance on non-treatment grids and produced variable results on rat control grids. Our results support the hypothesis that house mouse abundance is influenced by ship rats, that juvenile recruitment is affected and that competition for food is unlikely to be the sole mechanism of interaction. Future work will include monitoring a reversal of treatments within our study area.

Establishment of an Ecological Deer Management cooperative at Maragle, NSW

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Few management approaches have been successfully used on wild deer populations in Australia. Often deer are categorised as a pest and a hunting resource by different stakeholders, with statutory provisions for firearms use, hunting seasons and deer conservation status varying according to land tenure and jurisdiction.

Ecological Deer Management (EDM) is a novel management system for wild deer species which recognises such divergence by utilising game harvest management principles in conjunction with impact assessment, as used in a traditional pest management system. This concept allows harvest levels to be set by land managers ranging from a sustainable deer harvest to a mitigation harvest, depending on the impact of a deer population on environmental, agricultural or community values.

Game Council's pilot EDM project at Maragle NSW, aims to assess the density and impacts of a herd of wild fallow deer (*Dama dama*) on both public and private land through the establishment of an EDM cooperative. This project seeks to apply a whole of landscape approach to managing the deer population and their impacts.

Game Council staff, conservation hunters and land managers have been working together to monitor deer abundance through scat, aerial and spotlight surveys and to estimate deer impacts using quantitative and qualitative methods on properties across the region. EDM plans for each cooperative member will be devised using abundance and impact data and an adaptive harvest management approach in the near future.

Numerical and functional responses of prey to predators in far East Gippsland, Victoria

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Introduced predators such as the European red fox (*Vulpes vulpes*) have broad-scale conservation impacts in Australia and have been linked to losses of native vertebrate fauna. Novel predators can have both direct and indirect, or sub-lethal, effects on prey (for example, by altering the trade-off between foraging and vigilance) and may also compete with pre-existing native predators.

The introduction of the red fox into East Gippsland has resulted in increased predation on the common ringtail possum (*Pseudocheirus peregrinus*), as well as competition with the lace monitor (*Varanus varius*) for this shared food resource.

A long term '1080' baiting program, Southern Ark, has provided an experimental framework with fox-baited and unbaited sites across Cape Conran Coastal Park in East Gippsland. Numerical and functional responses, including occupancy and stress physiology, of *V. varius* and *P. peregrinus* were assessed in relation to the presence of foxes in these sites.

Given that Australian fauna have no co-evolutionary history with carnivorous eutherian predators, ecological naiveté could predispose them to elevated predation and competition from foxes. *P. peregrinus* exhibited signs of prey naiveté, with no significant numerical or functional responses to high fox abundance being detected. In contrast, *V. varius* showed an aversion to areas with higher fox abundance.

Linear habitat remnants function as corridors for dispersing mammals in fragmented landscapes

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Habitat fragmentation is a major challenge for conservation programs. Habitat corridors have been widely discussed as a conservation tool to address the problem of fragmentation, however empirical evidence showing that these fulfil this role is scarce and inconclusive. Theoretical studies and experimental model systems have been developed to investigate this question, but their applicability to real life situations is arguable. Although difficult to design and execute, and costly in time and resources, rigorous field studies are necessary to test the role of corridors in fragmented landscapes. One approach that could yield unambiguous data is to monitor animals dispersing naturally and determine whether they use corridors. We present GPS-tracking data from sub-adult bobcats (*Trichosurus cunninghami*) dispersing through highly fragmented habitat. While we obtained evidence that bobcats can traverse pasture, there was a clear behavioural preference for travel in association with trees. Linear forest remnants, even if only sparsely vegetated, were used whenever available, suggesting that these functioned as corridors. The clear tendency of this relatively large and mobile species to select for tree cover during dispersal raises the question of whether smaller animals, presumably more at risk of predation, would even attempt dispersal in the absence of habitat corridors

Native rat in the seabird colony: rodent management on Muttonbird Island, Coffs Harbour, Australia

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Muttonbird Island presents an interesting management issue: can we minimise black rat and mouse impacts on seabirds on a high visitation land bridged island where three species of rodent coexist? The unique finding of the native Swamp rat *Rattus lutreolus* poses an interesting rodent control management dilemma, to control exotics without affecting this native species. This program poses challenges including: targeting exotic rats whilst maintaining the native rat, minimising off-target raptor kills, a sensitive burrowed landscape, simultaneous mice/rat control, an immigration pathway, major port proximity and high visitation. Surveys recorded rodent densities of 9, 6.5 and 53 animals/ha for *R. lutreolus*, *R. rattus* and *M. domesticus* respectively. Rats preferred denser vegetation (*Flagellaria*, *Dianella*, and *Lantana*), with mice present across all vegetation types. A sustained control program (minimal off target species design) was implemented to counter a recorded decline in the shearwater population. 2010 trapping found zero *R. rattus* captures, but *M. domesticus* presence and bluetongue lizard increases pose future difficulties.

Habitat use and home-range of the northern quoll, *Dasyurus hallucatus*: effects of fire

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Radio telemetry was used to investigate changes in home range size in response to fire and seasonal fluctuations in resource availability by northern quolls *Dasyurus hallucatus* at two sites near the Mitchell River in the northern Kimberley, WA. We expected that home range would be larger in the dry season and that an imposed fire would

displace quolls or cause their home range area to increase. Based on den locations the mean home-range area for males was 64.2ha (SE±36.65; range 2.35-421.43ha). Females had smaller home ranges, of 6.8ha (SE±1.56; range 0.80-15.38ha). The largest home range for a male (421.43ha) was recorded in the dry season and the largest for a female (15.38ha) was recorded in the wet season. Quolls were not displaced by fire indicating that they are able to tolerate fires under these conditions. Observed differences in home range area appear to be related to seasonal effects on resource abundance rather than fire. Facultative post-mating male die-off was also investigated. Nine out of 15 males investigated survived beyond their first breeding season. Four of these were confirmed to survive to their second breeding season. This suggests that this habitat was particularly favourable at the time of sampling.

Temporal and seasonal use of compensatory nest boxes by vertebrate fauna in the Hunter Valley, NSW, Australia

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Nest boxes are a commonly used strategy for mitigating the loss of natural tree hollows used by arboreal and flying fauna, and for monitoring native and exotic wildlife. The implementation of nest box programs is often accompanied by a monitoring program, however, despite the collection of large data sets, these programs are rarely reported upon. In 2004 a nest box installation and bi-annual monitoring program was established in the Donaldson Coal Conservation Area (consisting of an operational open cut pit and several areas of bushland reserve) in the lower Hunter Valley, NSW, Australia. Here we report on the outcomes of the first 5 years of that monitoring program (2005-2009) with particular emphasis on the changing rates of usage and occupancy across seasons (summer and winter) and years. Forty-five nest boxes were installed and numerous species of vertebrate fauna were found to utilise them. Temporal and seasonal differences in usage were observed. Mean annual occupancy rose from 7.7% in 2005 to 61.1% in 2009 ($P < 0.01$). Summer occupancy was significantly higher than winter for each year ($P < 0.02$). The differences in occupancy rates across the seasons may reflect a lack of insulation in the nest boxes, making them less suitable than naturally occurring hollows in the cooler months. The next phase of this research program will examine microclimatic characteristics of nest box design and aspect by comparing temperatures within nest boxes to ambient air temperatures and temperatures within naturally occurring hollows.