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Can quolls be our companions?

KEEPING native animals as pets is a contentious issue, but for some animals it may be a good way to conserve them and boost their public image.

Quolls for example, were once abundant in the Australian bush, but their carnivorous nature saw them killed for the threat they posed to poultry and food stores. With all four species of these white-spotted, furry marsupials on the decline, Dr Meri Oakwood from the Australian National University and Dr Paul Hopwood from the University of Sydney, have canvassed the possibility of raising quolls as household pets.

'If quolls were able to be kept as pets, there could be an improvement in their public image, which may reduce persecution,' Oakwood says. 'And public demand for captive bred quolls could be used to support separate captive breeding programs for reintroduction into the wild.'

To determine the suitability of quolls as pets, Oakwood and Hopwood surveyed 20 scientists and wildlife carers with experience in handling the animals. They asked questions ranging from diet to housing requirements and behaviour to assess the attributes and requirements of quolls that could influence their suitability.

'Overall, it appeared that essential dietary components were readily available, housing was simple, quolls were rarely demanding on time, mostly healthy and rarely stressed,' Oakwood says. 'Specialist attention, such as veterinary, was only required occasionally and no adverse human health effects were observed.'

The main requirement for a happy quoll-human relationship however, was that the quolls were kept from a young age as a house-pet, either hand-raised or with the mother and handled regularly.

Oakwood and Hopwood concluded that the survey revealed a definite trend towards quolls being suitable as house-pets, which should be examined further. They recommended a pilot study be conducted, based on a captive breeding colony of quolls, whose offspring would be placed with carers as trial house-pets.

Oakwood M and Hopwood P (2000) A survey of the attributes and requirements of quolls that may affect their suitability as household pets. *Australian Zoologist* 31(2):365–375.

Wendy Pyper 10.1071_ISSN0311-4546EC104p34a

Why do some spiders decorate their webs?

ORB-WEB spiders employ some intriguing tactics in a bid to catch more prey. They choose web sites where food is more plentiful (such as near lights at night), they can increase the size of their webs when hungry, and are even known to adjust the mesh size of their webs to suit the size of their prey.

Spiders in the genus Argiope sometimes add decorations to their webs in the form of densely woven bands or ribbons of UV-reflective silk. You may have seen the decorative cross in the web of the St Andrew's Cross Spider. Other related species build a vertical band of silk, a circle, a partial cross or a doily.

The purpose of these decorations has generated much debate amongst arachnologists. Theories include the view that the decorations: strengthen the web, hide the spider and its outline from predators, attract prey, advertise the web to birds that could otherwise damage it, provide a sun shield, or are simply the sign of a stressed out spider!

Recently, Dr Marie Herberstein of the Department of Zoology, University of Melbourne, investigated two of these hypotheses: prey attraction and predation avoidance. Her field studies, near Sydney, on one of the species known as a St Andrew's Cross Spider, Argiope keyserlingi, support the prey-attraction hypothesis. Webs adorned with more decorative bands indeed captured more prey than those with fewer decorations. Furthermore, within individual spiders that changed the number of bands in their webs from day to day, more prey were caught on days when more decoration was employed. However, Herberstein observed no significant difference in the mortality of spiders with and without decorated webs.

She says while these findings support the view that web decorations act as prey attractants, this does not rule out the possibility of additional functions of web adornments. Direct-choice experiments would further resolve the question as to why some orb-weavers expend time and energy on web decoration.

Herberstein, ME (2000) Foraging behaviour in orb-web spiders (Araneidae): do web decorations increase prey capture success in *Argiope keyserlingi* Karsch, 1878? *Australian Journal of Zoology* 48:217–223.

Steve Davidson 10.1071_ISSN0311-4546EC104p34b

Speed kills animals too

THE ROAD safety slogan 'Speed Kills' doesn't just apply to humans. Wildlife can also be adversely affected. In some situations road mortality can even cause local extinctions.

While studying dasyurid carnivores in south-east Tasmania, Meena Jones had the opportunity to assess the impact of speed on a population of eastern quolls (*Dassyurus viverrinus*) and Tasmanian devils (*Sarcophilus laniarius*) when the Cradle Mountain Tourist Road at the northern end of the Cradle Mountain – Lake St Clair National Park was upgraded.

In 17 months, the population of 19 eastern quolls became extinct and the devil population, of 39 individuals, halved. Concurrently, there was a dramatic increase in the number of road-kills. Road mortality was strongly implicated as the factor responsible for the local decline and extinction, during the study period. The main factor believed to influence the rate of collisions between vehicles and wildlife was an increase in traffic speed of about 20 km/h and a greater increase in maximum speed.

Several measures designed to reduce the incidence of wildlife mortality were implemented.

Measures directed at drivers included physically slowing traffic speed by using 'slow points' and increasing driver awareness through signs and rumble bars placed across the road. Those directed at wildlife included deterring wildlife from crossing the road in the path of approaching vehicles, and installing pipes and ramps to encourage escape off the road. The slow points were effective in reducing vehicle speeds by 20 kmh. Wildlife quickly began using the ramps and pipes.

Jones found that the combined measures implemented were successful in reducing the road-kill rate to a level that natural population increase could sustain. The eastern quoll population was re-established within six months, and after two years, had recovered to 50% of its former level. There was also some indication that devil populations were recovering.

So, when driving in areas where wildlife is also present slow down and take care. More than your own life is at stake.

Jones ME (2000) Road upgrade, road mortality and remedial measures: impacts on a population of eastern quolls and Tasmanian devils. *Wildlife Research* 27:289–296.

Lachlan Garland 10.1071_ISSN0311-4546EC104p34c

Life and death at the forest's edge

ROADS built through tropical rainforests do more than just remove a long strip of forest. The composition of small mammal communities living alongside the roads can also be affected.

Zoologist Miriam Goosem has demonstrated how community composition differs close to the edge of an unsealed rainforest road from that of the forest interior in a study conducted north of Kuranda in north-east Queensland.

In the study area, the abundance of *Melomys cervinipes* (fawn-footed melomys) was greater close to the road than in areas further away. And significantly more *Rattus* sp. lived further from the road, preferring the undisturbed forest interior. At sites where the road clearing lacked canopy closure, these edge effects were more noticeable than where the canopy covered narrower clearings.

The preference for, or avoidance of, the edge appeared due to physical and biological changes in habitat close to the edge. Even a narrow strip of alien habitat was found to cause shifts in community composition in favour of generalist species, such as *M. cervinipes*, over edge-avoiding species.

Changes in the community composition may also be compounded by the intrusion of species from cleared areas, or species alien to the rainforest habitat (for example, *Rattus sordidus* and *M. burtoni*).

Goosem's study gives a clear message to managers of natural rainforest areas. Avoidance of rainforest areas when constructing new roads is extremely important. For existing roads, the best management option is to maintain canopy closure over the road surface or to re-establish canopy closure by rehabilitation plantings along the road verge.

Goosem M (2000) Effects of tropical rainforest roads on small mammals: edge changes in community composition. *Wildlife Research* 27:151–163.

Lachlan Garland 10.1071_ISSN0311-4546EC104p34d

Bad news for the predators of pilchards

IN OCTOBER 1998, mass mortality of Australian pilchards began in South Australia and spread across the species range over a period of seven months. Many beaches were carpeted with fresh and decaying fish bodies. How many pilchards died during this event and what were the likely ecological impacts?

Scientists at Fisheries Western Australia, Dr Dan Gaughan, Ron Mitchell and Stuart Blight, estimated the quantities of dead pilchards on the sea surface, sea floor and along beaches in three regions of southern WA. They knew that a previous mass death of pilchards during 1995, thought to be caused by a herpes virus new to Australia, had reduced stocks of spawning-age fish by about 10–15%. Another mass loss of fish so soon after the first could be cause for concern.

The team found that total mortalities at Esperance, Bremer Bay and Albany were about 17 590, 11 193 and 144 tonnes, respectively. Estimated mortality rates at Esperance and Bremer Bay were similar at 74.5% and 64.7%, with a mean of 69.6%. At Albany, the estimate was much lower (2.4%) but the scientists believe this is probably a misleading figure resulting from over-estimation of pilchard biomass in this region.

They concluded that at least 28 000 tonnes of mature pilchards were killed off the south coast of WA in early 1999. This is equivalent to three to five year's worth of annual catches by the commercial pilchard-fishing industry being harvested in just two months.

If these estimates are about right, it is bad news for species that rely on pilchards for food. These include tuna, Australian salmon and other fish; squid; seabirds such as gannets and penguins; and mammals like dolphins and seals. Deleterious effects on some of these animals have already been observed following this and the earlier event. Scientists believe that pilchards imported to feed caged tuna are the most likely source of both disease outbreaks.

Gaughan DJ Mitchell RW and Blight SJ (2000) Impact of mortality, possibly due to herpes virus, on pilchard *Sardinops sagax* stocks along the south coast of Western Australia in 1998–99. *Marine and Freshwater Research* 51:601–12.

Steve Davidson 10.1071_ISSN0311-4546EC104p34e

Queensland Department of Natural Resources

Dingoes, roos . . . and a long, long fence

AUSTRALIA'S dingo fence was erected to protect sheep flocks from the depredations of dingoes. Scientists, Tony Pople, Gordon Grigg, Stuart Cairns, Lyn Beard and Peter Alexander, were interested in the factors determining population size in red kangaroos and emus, as part of a long-running study of kangaroo ecology. They investigated the role of dingo predation by comparing prey abundance inside and outside the dingo-proof fence.

Results of their aerial surveys, conducted over 15 years in three areas of the South Australian pastoral zone, showed that densities of red kangaroos and emus were significantly greater inside the fence than on the dingo side, the difference varying between areas and over time. As expected, dingo numbers were greater outside the exclusion fence (to the north).

Red kangaroos living within the protection of the dingo fence, in our sheep-grazed rangelands, are thought to be food limited, since their numbers respond to fluctuations in pasture availability, which, in turn, varies with rainfall. The fact that kangaroo abundance is generally substantially lower outside the fence, where dingoes roam, now suggests that dingo predation also strongly limits kangaroo numbers.

Furthermore, say the scientists, dingoes may sometimes 'regulate' these prey populations. This would mean that they not only limit prey numbers, but actually alter the population dynamics of the prey by stopping them from increasing above some prey density. To do this, dingoes must kill proportionally more kangaroos and emus as these prey populations try to increase. Supporting this view was the finding that, whereas kangaroo and emu populations inside the fence typically recovered quickly after drought, on the outside these prey species remained at low densities.

Pople, AR, Grigg, GC, Cairns, SC, Beard, LA and Alexander, P (2000) Trends in the numbers of red kangaroos and emus on either side of the South Australian dingo fence: evidence for predator regulation? *Wildlife Research* 27:269–276.

Steve Davidson 10.1071_ISSN0311-4546v104p34f