



"Together, create and apply solutions"

Invasive Animals Cooperative Research Centre

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Secretariat
Independent review of the EPBC Act 1999
GPO Box 787
Canberra ACT 2601
Australia

17 December 2008

Dear Sir/Madam,

Submission to the Independent Review of the EPBC Act 1999

The Invasive Animals Cooperative Research Centre (IA CRC) is involved in research and development to limit the impact of vertebrate pest animals on Australia's environment, economy and society. We are likely the largest such research group in the world, bringing together 41 participants from Australia, New Zealand, the United States and United Kingdom.

During the course of 2008, our CRC had cause to become involved in the debate over the importation of the Savannah cat, which Minister Garrett subsequently blocked using the *Environmental Protection and Biodiversity Conservation Act 1999*. Our submission in regard to that matter is attached.

We believe the Minister used the *EPBC Act* appropriately to block importation of Savannah cats, which were likely to have a detrimental impact on the environment. However, his action resulted from a degree of serendipity (i.e. the proposed importation became public knowledge). In our view the onus to argue that the importation posed an environmental risk should not have been on groups such as ours, but on the importer to prove safety (or undertake measures to ensure environmental safety).

The ban on importation of Savannah cats applies only to cats with genes from the African serval. A number of other hybrid cats (wildcat x domestic cat derivatives) are in existence and wolf-dog crosses and coyote-dog crosses are kept as pets in the United States. The current legal situation is that these animals can be freely imported if they are five generations away from the original wild animal. This definition appears to have been inappropriately drawn from the CITES Convention.

We believe the *EPBC Act* should be adjusted to effectively ban the importation of any fertile hybrid animals. This could be effectively achieved by adjusting the *EPBC's Scheduled List of Specimens taken to be Suitable for Live Import* to make it illegal to import any hybrids of the listed species.

The experience with the Savannah cat is instructive. No members of the inter-government Vertebrate Pests Committee were consulted about the

proposed introduction of these animals. A public outcry (and subsequent banning by the Minister) only occurred because the breeders had begun advertising kittens for sale.

Up to half a million Americans own a wolf-dog hybrid. On average, they kill an American child every 18 months. Under current arrangements, it would be legal for a breeder to import these animals to Australia, provided they were five generations away from the wild form (dogs have been domesticated for perhaps 20,000 generations, so we argue that the use of the CITES definition, developed for a different purpose, is inappropriate).

IA CRC research indicates that Australian wild dogs are 21-24% larger than they were 30 years ago. Hybridisation of dingos with domestic dogs is at least partly responsible. Larger dogs will take larger prey and therefore have a different role in the ecosystem. The presence of wolf-dogs in the Australian environment would add to this problem and undoubtedly cause environmental harm.

Hybridisation is a market trend designed to develop more exotic pets. Some six or seven wildcat-domestic cat hybrids are now available. There are likely to be many fish developed to satisfy the market for exotic species. The trend towards exotic pets means there is a market pull for animals with a wilder look: servals, wolves, piranha for example.

Breeders intending to bring these animals into Australia will have learnt from the Savannah cat experience. They will not advertise ahead of getting animals into the country. Once in Australia, there is little or nothing the Australian government could do.

Designer hybridisation of pets is relatively new. The *EPBC Act* needs to be updated to keep up with this trend. We believe adjustment of the permitted live import list would provide a higher level of protection to the Australian environment than is currently the case.

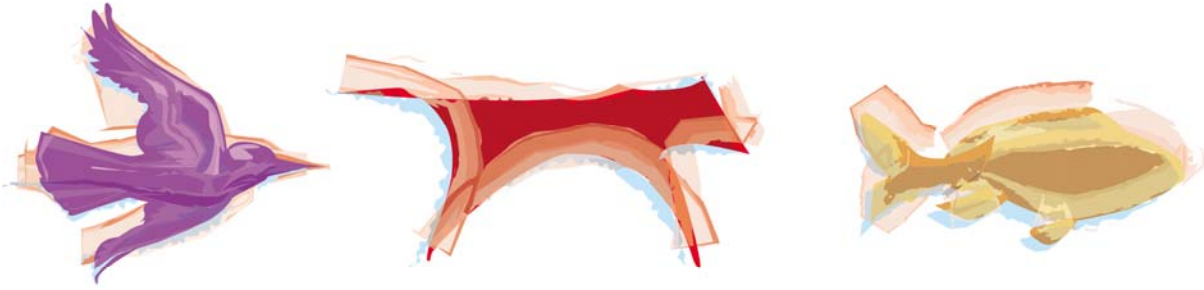
Thank you for your consideration.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Tony Peacock', written over a large, light-colored circular mark.

Professor Tony Peacock
CHIEF EXECUTIVE

Encl. (1).



Invasive Animals Cooperative Research Centre

Response to

Draft environmental assessment of the suitability of the import of the Savannah Cat (Domestic Cat x Serval hybrid specimens) into Australia

Authors¹

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Summary

The Invasive Animals Cooperative Research Centre concurs with DEWHA's ***Draft Risk Assessment of the Suitability of the Import of the Savannah Cat into Australia***, issued on 19 June 2008: we agree that Savannah cats are unsuitable for import. Further, we strongly agree that prohibiting import is the most cost-effective method of risk mitigation, to avoid potentially devastating consequences of the release of Savannah cats into the Australian environment.

We argue in this submission that:

1. Genes do not simply 'dilute' over generations of animals and therefore:
 - 1.1. It is seriously misleading to assert that F₅ Savannah Cats have only 3.125% African Serval genes — the likely percentage is considerably higher due to phenotypic selection.
 - 1.2. It is seriously misleading to assert that should African Serval genes enter the Australian feral cat population, they would simply be diluted out — conversely, they may well confer a fitness benefit that would be highly selected and/or result in hybrid vigour.

¹ The authors acknowledge the input and assistance of Frank Nicholas and Chris Moran, both Professors of Animal Genetics at the Faculty of Veterinary Science, University of Sydney. Gwilym Haynes, PhD candidate provided a draft of his thesis on carp genetics. Andreas Glanznig reviewed drafts and made helpful comments.

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2. The CITES definition of an animal hybrid is used correctly in DEWHA's Risk Assessment to determine that F₅ Savannah Cats fall outside that convention. However, it has been incorrectly applied elsewhere to argue that an F₅ Savannah Cat is domestic.
3. New genes can 'supercharge' a feral population. There are numerous examples where new genetic lines have led to feral populations taking off, most likely through hybrid vigour and/or by generating advantageous phenotypes outside the previous range.
4. DEWHA has correctly assigned the risk assessment parameters provided by Bomford's 2003 model. Assessment using the most recent Bomford (in press) model also results in an Extreme risk of establishment, but it should be noted that parameter B4 (non-migratory behaviour) is no longer considered a risk parameter for mammals in this updated model — when removed, the revised score is 15/15 rather than 15/16.
5. Risk mitigation proposals by importers are manifestly inadequate. A decision to allow importation will be used as precedent for other future importers. Confinement procedures are unenforceable over the longer term with these animals in private homes.
6. Savannah cats are derived from unsound animal welfare practices, which are at odds with the Australian Animal Welfare Strategy, endorsed by all Australian governments.
7. The benefit of Savannah cats to Australia is exceptionally small and cannot justify the risk involved.

Consequently, the Invasive Animals Cooperative Research Centre strongly opposes the importation of Savannah cats into Australia.

Response to DEWHA's Draft Risk Assessment

The Invasive Animals Cooperative Research Centre (IA CRC) welcomes the opportunity to comment on the Draft Environmental Assessment of the Suitability of the Import of the Savannah Cat (Domestic Cat X Serval Hybrid Specimens) Into Australia, issued under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Part 13A on 19 June 2008.

The IA CRC is comprised of 41 participant organisations and represents probably the largest research group of scientists with interests in invasive animals. We are concerned with a large number of vertebrate pests, including the feral cat (*Felis catus*). We fund numerous research, development and training projects into the feral cat and its impact on biodiversity.

We consider that the genetic makeup of Savannah cats is inappropriate for importation into Australia. The Olsen and Jenz (2007) report is deficient in its analysis of the genetics of the F₅ Savannah cats and media comment by potential importers of these animals in the past several weeks has indicated a lack of knowledge of animal genetics.

1. Genes do not simply 'dilute'

1.1 It is seriously misleading to assert that F₅ Savannahs contain only 3.125% African Serval genes

The IA CRC wishes to dispel the very simplistic view that an F₅ Savannah cat is only 3.125% African Serval. This claim is based on an F₅ hybrid resulting from a simple halving of the serval genotypic makeup from 50% to 3.125% over each of five generations. This reduction would be seen only in the case where in each of the four generations of back-cross matings, the hybrids chosen for mating to domestic cats are chosen at random – without any regard to serval-like appearance.

However, almost all Savannah breeders market on the basis of the Savannah cat's similarity to the African Serval. A serval-like phenotype of breeding stock is therefore a paramount selection criterion. In other words, there is quite strong selection for serval appearance amongst the backcross hybrids, and inevitably this leads to the retention of a substantially higher proportion of serval genes at the F₅ generation than expected with random selection. The stronger the selection for serval-like appearance amongst the backcross hybrids, the larger the proportion of serval genes that will be retained.

Indeed, one of the importers boasts on their website that the F₅s they intend to import to Australia 'look more like F₃s'³. These F₅s are certain to contain a substantially higher proportion of serval genes than 3.125% of their genome. The theoretical possibilities at the F₅ generation in fact range from 0-50% of the genome being made up of serval genes. In the absence of a test for genotype composition, the only indicator available is phenotype: the more an F₅ animal looks like a serval, the closer to 50% is its proportion of serval genes likely to be

It is well known that breeders can accelerate or decelerate the change in genetic composition by applying phenotypic selection during backcrossing. Genetic markers across the genome can be used to track such changes in breed composition — so called Marker Assisted Introgression. If sufficient introgression markers or other genetic markers that distinguish serval cats from domestic cats existed, it would be possible to test the F₅ cats to measure the amount of residual serval genome. To the IA CRC's knowledge, no Australian genetic laboratories currently have the capability to conduct such tests. So, the precise proportion of serval genes in the Savannah cats proposed for import remains uncertain. Any claim that these animals are only 3.125% serval is clearly unsubstantiated, and is contradicted by the appearance of the animals.

1.2 Serval genes could be favoured in the feral population

An escaped, dumped or promiscuous F₅ Savannah cat can pass serval genes onto a population. If these genes convey a degree of fitness over the general population, they may be selected in future generations. For example, the serval's efficiency as a hunter is partially attributed to its superior hearing. Serval's are able to detect ultrasonic sounds from rodents and pounce-kill them with great efficiency. These genes may well be conserved in F₅ Savannah cats (owners report they are unable to surprise their pet Savannahs) and be available for selection should a Savannah cat enter the feral population. Similarly, the Savannah cats are renowned for their ability to jump much higher than domestic cats. Genes conferring attributes such as these could be quickly selected in a feral population if they convey superior hunting skills.

It is therefore fanciful to assert that the African Serval's genes will be diluted and have no effect in a feral population - the outcome is by no means certain but it is most likely that these genes would be *favoured* rather than *diluted*.

2. CITES status does not determine appropriateness for importation

It is important to note that the Convention on International Trade in Endangered Species (CITES) does not define what constitutes a domestic animal. The hybrid definition (attached as Appendix 3 of the Draft Risk Assessment) is merely to determine coverage of the Convention. DEWHA's assessment correctly deals with this matter. However, Olsen and Jensz (2007) state that '...the United Kingdom applied the F₅ CITES requirements in regards to the import of wild cats or their hybrids, that is, fifth generation hybrids were considered to be domestic'.

We strongly disagree that the CITES hybrid definition — intended to stop international trade in endangered species — should be used to determine in any way which animals can be freely traded and privately owned in Australia. Even if the United Kingdom uses the definition for importation purposes into that nation, it does not follow that this use is appropriate for Australia, with our unique fauna and flora.

³ Savannah Cats Australia website

DEWHA's draft assessment uses the CITES definition simply to determine the status of an F₅ or later Savannah cat under the convention, in line with the Terms of Reference provided under Part 13A of the EPBC Act. Unfortunately, it is clear from media statements by Savannah cat importers and the Pet Industry Association of Australia⁴ that an expectation has been built that the F₅ somehow represents the point at which these animals can be regarded as domestic and therefore 'safe'.

Driscoll (2007) indicates that cats were domesticated between 12,000 and 8,000 years ago. The process appears to have been that cats chose to associate with humans as humans established permanent homes, rather than through humans capturing wild cats. We know that even with a history of thousands of generations as a domestic animal, cats can revert to wild living very successfully. In the absence of any scientific literature in regard to the Savannah cat, we believe it is entirely inappropriate to assume that five generations represents some magical point at which domesticity is reached. The precautionary principle would point us in quite the opposite direction.

3. New genes can 'supercharge' feral populations

Haynes (2008) has studied the genetic make-up of populations of common carp (*Cyprinus carpio*). Within the same species, different strains of carp have had significantly different invasive impacts in eastern Australia. Common carp were introduced in the 1860s as an aquaculture species, and the 'Prospect' strain, as it became known, had little impact on the environment. However, the 'Boolara' strain of carp, introduced in the 1960s, became a highly invasive species, spreading throughout most of the Murray–Darling Basin. There is no doubt that environmental factors assisted in the spread of the Boolara strain. Nevertheless, this example shows that very small differences in genetic composition (between strains) can be associated with substantially different invasive impacts.

Hänfling (2007) reviewed the important role that hybridisation plays in making an introduced species invasive. Hybrid vigour, or heterosis, may occur and confer a benefit on the progeny. Also, novel allele combinations may improve the potential for survival and reproduction in a new environment, by extending the phenotypic range of offspring beyond that of the parents (for example, producing a better camouflage coat).

New data from Australian wild dog populations support the view that divergent lines of animals coming together in a feral population may make the population more invasive (Spencer *et al* unpublished). Prior to the 1970s, wild dogs in southern Australia weighed an average of 14.5 kilograms. They are now an average 17.5 kilograms and, particularly in the Great Dividing Range, we are seeing what these authors describe as 'super-dingoes'. These data imply that introduction of new genes from domestic animals can lead to hybrid vigour in wild populations. The authors suggest that, if the trend continues, wild dogs are likely to engage in prey-switching behaviour (i.e. predate on larger animals than previously).

Other examples where mixing of genes from divergent sources of the same species has led to greater invasiveness include: green anole lizards in Florida and Hawaii, European rabbits in Australia and European green crabs in North America (Zenger *et al* 2003, Kolbe *et al* 2004, Kelly *et al* 2006). The possibility of Savannah cats contributing to the already effective invasiveness of feral cat populations cannot be dismissed.

It is important to note that many of the references in this section are very recent, and a number of the studies discussed are very long term in nature. This situation is an accurate reflection of the state of knowledge about invasiveness — our understanding does not run deep, new tools are now assisting our knowledge, and it takes perhaps decades to accurately determine impacts. The bottom line must be to take a precautionary approach to the import of any new hybrid species, which are an unknown entity.

⁴ *Australia Talks*, ABC Radio National, 24 June 2008

4. Bomford's risk assessment parameters

DEWHA has used Bomford's 2003 Risk Assessment model and applied it correctly in our opinion. We are aware of Dr. Bomford's modification of the model and we have made an assessment using the most recent Bomford (in press) model. This analysis also results in an 'Extreme' risk of establishment, but it should be noted that parameter B4 (non-migratory behaviour) is no longer considered a risk parameter for mammals in this updated model — it has been removed, giving a revised score of 15/15 rather than 15/16.

5. Risk mitigation proposals by importers are inadequate

We do not believe that animals containing a percentage of African Serval genes are appropriate to be kept by private citizens. We agree with the Draft Risk Assessment that it is inevitable that some of these animals will escape, be dumped or mate with other cats, such that their genes will find their way into the feral population.

Risk mitigation proposals by Savannah cat importers are admirable in that they encourage responsible pet ownership. However, it is intended that these animals be held by private citizens with no ongoing certification and/or inspection process. It is quite feasible that some of these cats will not prove to be perfect pets at all, with their jumping and hunting abilities, and will consequently be dumped, or escape from ineffective household enclosures.

A high price for Savannah cats will not ensure adequate security. A simple Google search reveals dozens of advertisements for low-priced Savannah cats in the United States. Australian experience with many animals new to the market has shown that prices often crash once the small breeding market is saturated. The Savannah Cat Club has established Savannah Cat Rescue⁵. These cats do escape and get dumped overseas and that will also happen in Australia, if the cats are allowed entry.

6. Savannah Cats are derived from unsound animal welfare practices

Although perhaps beyond the scope of the EPBC Act, we believe the derivation of the Savannah cat as a breed is contrary to the Australian Animal Welfare Strategy (AAWS), which all Australian Governments have endorsed. The AAWS Vision is that 'the welfare of all animals in Australia is promoted and protected by the development and adoption of sound animal welfare standards and practices.'

Mating an African Serval with a domestic cat is not a sound animal welfare practice. The International Cat Association (TICA) Breed Standard for the Savannah cat permits outcrosses back to the African Serval and the practice of deriving Savannahs from Serval-cat matings continues today.

These species have gestation periods that differ by 10 days. Because F₁ Savannahs are the result of a male African Serval to female domestic cat mating, kittens are often miscarried, stillborn or premature, requiring intensive post-natal attention for survival. Savannah cat websites often describe the birth and survival of Serval-cat offspring as a 'miracle' because of its rarity. We suggest that it is entirely predictable that mating animals with significantly differing gestation periods will result in poor welfare outcomes and therefore should not be practised.

Much has been made in the media of the fact that TICA registers the Savannah breed. It is our understanding that the three other large international registries expressly exclude the possibility of registering this breed, or any other derived from wild-domestic matings⁶.

⁵ <http://www.savannahcatclub.com/rescue.htm>

⁶ The Cat Fanciers Association's policy is found at <http://www.cfa.org/articles/domestic-outcross.html> The Fédération Internationale Féline's policy is found at <http://www.cfa.org/articles/domestic-outcross.html> The Governing Council of the Cat Fancy registered the Bengal Breed but decided further breeds derived from wild cats would not be considered for registration (Beeson, pers. comm.).

7. The benefit does not outweigh the risk

The IA CRC accepts that there are many societal benefits from pet ownership.

However, the RSPCA euthanizes about 33,000 cats annually, meaning that the likely total of cats euthanized annually in Australia exceeds 50,000. There is no shortage of cats for Australians to own if they wish to do so.

Three quarters of Australians currently rate cats as the worst feral animal in the country (Fisher and Cribb, *unpublished*), second only to the cane toad and well ahead of the third-rated feral, the rabbit.

As a new breed only established in the last two decades, there is no heritage value of Savannah cats. It is extremely unlikely any immigrants to Australia have left behind a valued pet from this breed. Denying ownership of a Savannah cat to any Australian is of insignificant consequence.

Any risk assessment must be weighed against the potential benefit. Importation of Savannah cats has no benefits to Australia's economy, very little (if any) benefit to our society and a potential severe negative impact on our environment. The IA CRC takes the view that the risks vastly outweigh any benefits, and therefore importation of this breed should be denied.

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