

REVIEW

A global review of the impacts of invasive cats on island endangered vertebrates

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Abstract

Cats are generalist predators that have been widely introduced to the world's ~179 000 islands. Once introduced to islands, cats prey on a variety of native species many of which lack evolved defenses against mammalian predators and can suffer severe population declines and even extinction. As islands house a disproportionate share of terrestrial biodiversity, the impacts of invasive cats on islands may have significant biodiversity impacts. Much of this threatened biodiversity can be protected by eradicating cats from islands. Information on the relative impacts of cats on different native species in different types of island ecosystems can increase the efficiency of this conservation tool. We reviewed feral cat impacts on native island vertebrates. Impacts of feral cats on vertebrates have been reported from at least 120 different islands on at least 175 vertebrates (25 reptiles, 123 birds, and 27 mammals), many of which are listed by the International Union for the Conservation of Nature. A meta-analysis suggests that cat impacts were greatest on endemic species, particularly mammals and greater when non-native prey species were also introduced. Feral cats on islands are responsible for at least 14% global bird, mammal, and reptile extinctions and are the principal threat to almost 8% of critically endangered birds, mammals, and reptiles.

Keywords: *Felis catus*, feral cats, impact, islands, predation

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Introduction

Domestication of the cat took place around 9000 years ago from the Near Eastern wildcat (*Felis silvestris lybica*) (Randi & Ragni, 1991; Serpell, 2000; Vigne *et al.*, 2004; Driscoll *et al.*, 2007). Since then domestic cats (*Felis silvestris catus*) have traveled with humans to most corners of the globe including many remote islands where they have become feral (Fitzgerald, 1988).

Feral cats on islands are dietary generalists feeding on many types of native and introduced prey, including vertebrates (mainly mammals, birds, and reptiles) and invertebrates (chiefly insects) with much of the variation explained by prey availability (Fitzgerald &

Turner, 2000; Nogales & Medina, 2009; Bonnaud *et al.*, 2011). As many native island species have reduced behavioral, morphological, and life-history defenses against mammalian predators, and because islands have a disproportionate share of global terrestrial biodiversity (Kier *et al.*, 2009), feral cats are thought to have been a major driver of biodiversity loss causing extinctions of insular endemic birds and mammals and local extinctions of island breeding seabirds (e.g. Veitch, 1985; Dowding & Murphy, 2001; Medway, 2004; Keitt *et al.*, 2006; Wolf *et al.*, 2006; Knowlton *et al.*, 2007). In addition to direct impact of predation, indirect impacts, such as apparent competition, food competition, or transmission of disease have also been reported or suggested (Nishimura *et al.*, 1999; Phillips *et al.*, 2007; Rayner *et al.*, 2007). Feral cats can also influence other ecological process by their predation upon nectiv-

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orous and frugivorous vertebrates especially disruption of native seed dispersal systems (Nogales *et al.*, 1996) or secondary long-distance dispersal of invasive plants (Bourgeois *et al.*, 2004).

Cats can be eradicated from islands (Nogales *et al.*, 2004) after which threatened species can recover (Aguirre-Muñoz *et al.*, 2008). However, cats have been eradicated from fewer than 100 islands (Nogales *et al.*, 2004; Campbell *et al.*, 2011), but have likely been introduced to at least 5% of the world's 179 000 small and medium sized islands (B. Tershy, unpublished data). The current rate of cat eradications from islands is not having a significant impact on the thousands of islands where invasive cats likely threaten native wildlife. Consequently, to maximize their biodiversity benefits, future cat eradications will have to be prioritized and to do so effectively, conservation biologists must have a better understanding of the impacts of feral cats on native island species.

There have been no global reviews of feral cat impacts on islands. Information the impact of feral cats is scattered with qualitative reviews of impacts on mainland or large islands of continental origin (Australia: Dickman, 1996; New Zealand: Taylor, 2000; Dowding & Murphy, 2001; Gillies & Fitzgerald, 2005; Great Britain: Dyczkowski & Yalden, 1998; Woods *et al.*, 2003) and partial reviews by Fitzgerald (1988) and Fitzgerald & Turner (2000). Here, we review the literature on the impacts of feral cats on island animals and use meta-analysis techniques to help predict which types of threatened native island species are most impacted by feral cats and under what conditions are they most impacted.

Materials and methods

Data collection

We compiled data from published and gray literature covering most of the world's insular regions where impacts by feral cats were documented. To drive conservation action, we included only prey species that have been assigned to one of the five most threatened categories by the IUCN 2008 Red List: vulnerable, endangered, critically endangered, extinct in the wild, and extinct. Furthermore, we also included those cases of endemic subspecies that have become extinct on the only island where they lived, although other subspecies survive elsewhere. Invertebrates were often found in the diet of feral cats on islands, but none of the invertebrates recorded were listed as threatened in the IUCN (2008) Red List of Threatened Species, so our results discuss vertebrates exclusively. Moreover, only cases that clearly reported feral cat impact on species on specific islands were included.

We defined impact as any inference that cats had caused a decline in the population abundance or geographical distribu-

tion of a native insular species. While many publications and internal reports do not quantify the magnitude of a population decline, there is often strong inference of a decline due to feral cat predation (Dickman, 1996). Furthermore, many of these considerations of impact are anecdotal and thus alone should be interpreted with care. For this reason, three different classes of impact were considered following the suggestions established in each studied case: mixed (when the cat effects had been compounded by other factors), high (when there was high evidence of a severe effect of cats on species populations), and strong (when the extinction of a particular taxon on a specific island was attributed to feral cats). All islands have been included with the exception of Great Britain, Australia and the two largest islands of New Zealand, where feral cat impacts have been reviewed elsewhere (see Dickman, 1996; Taylor, 2000; Woods *et al.*, 2003; Gillies & Fitzgerald, 2005).

Our database includes 229 separate cases, each of which consists of a unique island-prey species combination for which we found evidence of feral cat impacts. For each case, we recorded the species affected; its taxonomic classification (class/family), provenance (insular endemic or present on continents), and IUCN status; degree of impact reported by feral cats and evidence on which this categorization was based; island characteristics including origin (oceanic/land-bridge), size, elevation, latitude, longitude, region, ocean, and presence of other exotic predators or prey; and published or gray literature source(s). The degree of cat impact in each case was coded as 0.01 if cats and potential prey coexisted with no apparent negative effects on the prey; 0.5 if cats had mixed or complex effects (see above); 0.9 if cats had severe effects on prey; and 1 if cats completely extirpated the prey population (Jones *et al.*, 2008).

Data analysis

We used meta-analysis to determine the effect size and significance of feral cat effects on prey species by class (Mammalia, Aves, Reptilia), endemism (insular only or insular + continental), and selected island characteristics across the 229 separate cases in our database. Formal meta-analysis involves weighting of individual cases based on each study's variance and/or sample size. As no variance or sample size data exist for our data (each is a single case of a feral cat-prey species interaction associated with a categorical degree of impact), we conducted two types of analyses: (i) unweighted meta-analyses, which simplify to traditional ANOVA or ordinary least squares (OLS) regression analyses; and (ii) weighted meta-analyses using bootstrapping and 5000 randomizations each to generate results robust to violations of parametric assumptions, and using weights assigned to each of our 229 cases. We assigned weights *sensu* Jones *et al.* (2008), who developed a categorical series of qualitative weights assigned to each case based on the type and strength of evidence provided for the case.

For our first analysis, of the effect of prey taxonomic class on severity of feral cat impact, we did both unweighted ANOVA and weighted nonparametric (bootstrapped) analyses. They

produced nearly identical results, with no effect on outcome and a minor difference in effect size. For this reason, and because the unweighted analyses increase power and allow inclusion of both multiple independent variables and interaction terms, we proceeded with unweighted analyses of the remaining relationships. Only when results of an analysis were marginally significant or marginally nonsignificant did we check by running a weighted analysis. Fail-safe numbers are reported only for traditional meta-analyses and indicate how many additional cases reporting no effect would need to be included to eliminate a significant overall effect size.

Results

General analysis

Impacts of feral cats upon vertebrates have been described on at least 120 different islands around the world (Fig. 1). A total of 175 threatened taxa (25 reptiles, 123 birds, and 27 mammals) were impacted by cats on islands based on their status in the 2008 IUCN Red List (Table 1; see Supporting information, Appendices S1–S4). Of the reptiles, 16 taxa were endemics and 9 natives. The most important groups affected were the iguanas (14 taxa), and lizards (6 taxa), plus four turtles

and one snake. Cats impacted 48 taxa of endemic birds in four main groups: landbirds (61 taxa, 49%) mostly belonging to Passeriformes and Psittacidae; seabirds (45 taxa, 36%), especially burrowing petrels, albatrosses, and penguins. Waterbirds and shorebirds were the groups with fewest species affected (11 and 6, respectively). Of the 27 mammal taxa impacted by cats, four were endemic. Fifteen taxa (55.6%) were rodents while eight were marsupials, two soricomorphs, one chiropteran, and one primate.

Studies documenting the impacts of feral cats on threatened island taxa were not evenly distributed, with more studies on birds in the Pacific and more studies on reptiles in the Caribbean (Fig. 1). Reptile impacts were dominated by iguanas in West Indies and Fiji, and giant lizards in the Canary Islands. Bird impacts were dominated by passerines and petrels throughout the Pacific and mammal impacts dominated by rodents in Baja California and Galapagos.

Based on our database, feral cats on islands have contributed to 33 (13.9%) of the 238 global bird, mammal, and reptile extinctions (including species extinct in the wild but extant in captivity) recorded by the IUCN Red List (Table 2; Fig. 2; Appendices S1–S4). They have

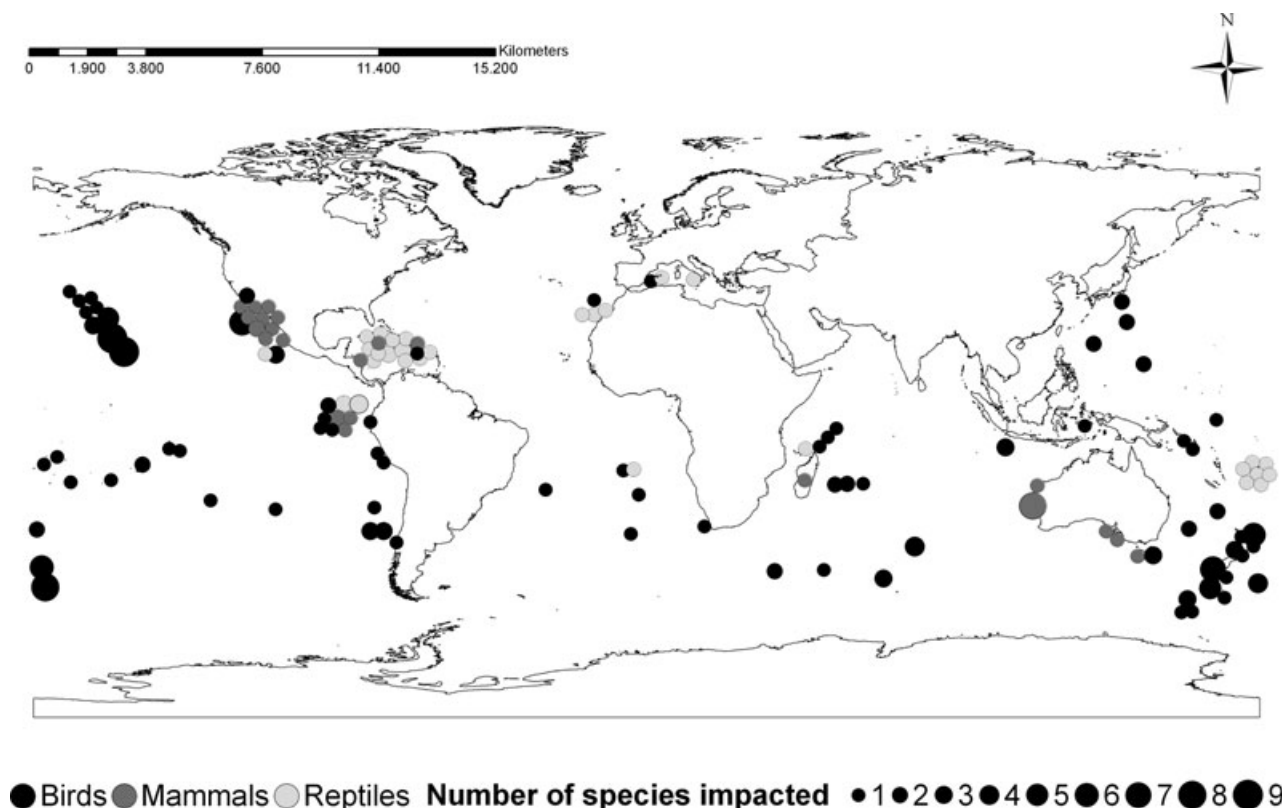


Fig. 1 Islands where impacts of feral cats (*Felis silvestris catus*) have been described. Light gray spots, reptiles; dark gray spots, birds; black spots, mammals.

Table 1 Number of species and taxa of the different prey groups affected by feral cats (*Felis catus*) on islands, according to the five most critical categories of the IUCN 2008 Red List of Threatened Species: EX, extinct; EW, extinct in the wild; CR, critically endangered; EN, endangered; VU, vulnerable. Number of subspecies is indicated in brackets

Groups	EX	EW	CR	EN	VU	Total	Total taxa
Reptiles	1 (1)	–	9 (1)	4 (2)	2 (5)	16 (11)	25
Birds	11 (9)	2 (–)	24 (1)	32 (2)	37 (5)	106 (17)	123
Mammals	4 (5)	–	3 (–)	7 (–)	8 (–)	22 (5)	27
Total	16 (15)	2 (–)	36 (2)	43 (4)	47 (10)	144 (31)	175

also contributed to 38 (8.2%) of the 464 critically endangered birds, mammals, and reptiles (Fig. 2; Appendices S1–S4).

The effect of feral cats was considered as mixed in the 69.4% of the 229 cases, while 16.2% and 14.4% of the impacts were high and strong, respectively (see Supporting information). Strong impact levels were most common for birds and mammals. On >75% of islands with recorded feral cat other introduced predators such as rats, mongoose, stoats, weasels, dogs or pigs, were also present.

Meta-analysis

Feral cats on islands have strong negative overall impacts on reptiles, birds, and mammals ($N = 229$, fixed-effects unweighted meta-analysis $P < 0.05$, Rosenthal's fail-safe number = 5778; effect sizes: mammals

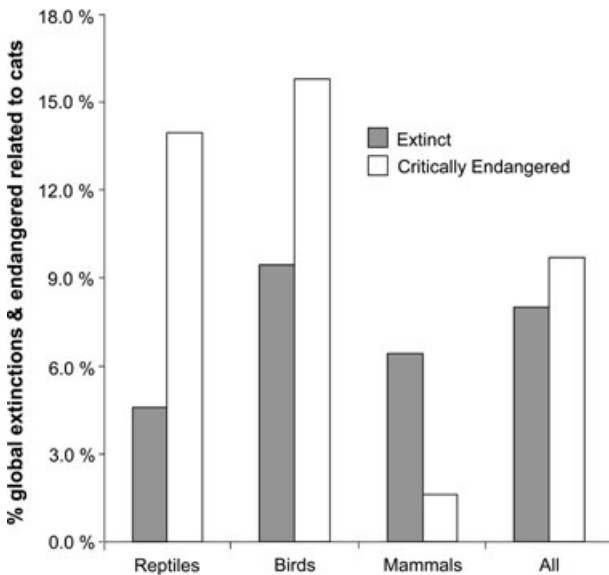


Fig. 2 Percent of all extinctions recorded by the IUCN 2008 Red List (including species extinct in the wild, but extant in captivity) that were caused, at least in part, by feral cats on islands (filled bars). Percent of all critically endangered species for which cats are a significant threat (open bars).

0.6088, birds 0.5484, and reptiles 0.5290). For insular endemic species and subspecies ($N = 213$), the overall severity of cat impacts varied by taxonomic class (ANOVA, $F = 3.30$, $P = 0.039$), with cat impacts significantly greater on mammals than on birds (Tukey's *post hoc* $P = 0.028$) (Fig. 3). When continental species that also occur on islands were included in the analysis, there were no significant differences of cat impact between vertebrate classes.

Across vertebrate classes, feral cats on islands have larger impacts on insular endemic species than on continental species (ANOVA, $F = 6.32$, $P = 0.013$) (Fig. 4a). This pattern appeared consistent in each vertebrate

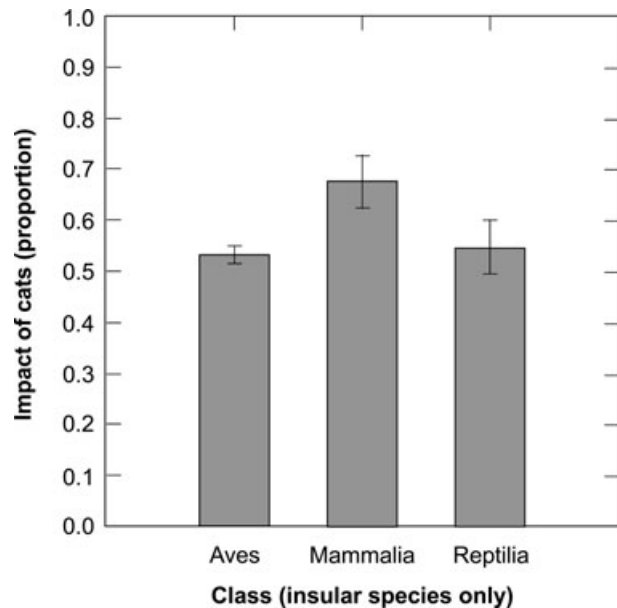


Fig. 3 Meta-analysis effect sizes of overall cat impacts on each vertebrate class in our database, including only those prey species limited to islands (213 of 229 cases). For all three prey classes, mean effect of feral cats is significantly >0 ($P < 0.05$), where effects range from 0.01 (no apparent effect) to 1 (complete extirpation). When continental prey species are excluded, mammals are significantly more affected by cats than are birds (see text for details). Bars are ± 1 SE.

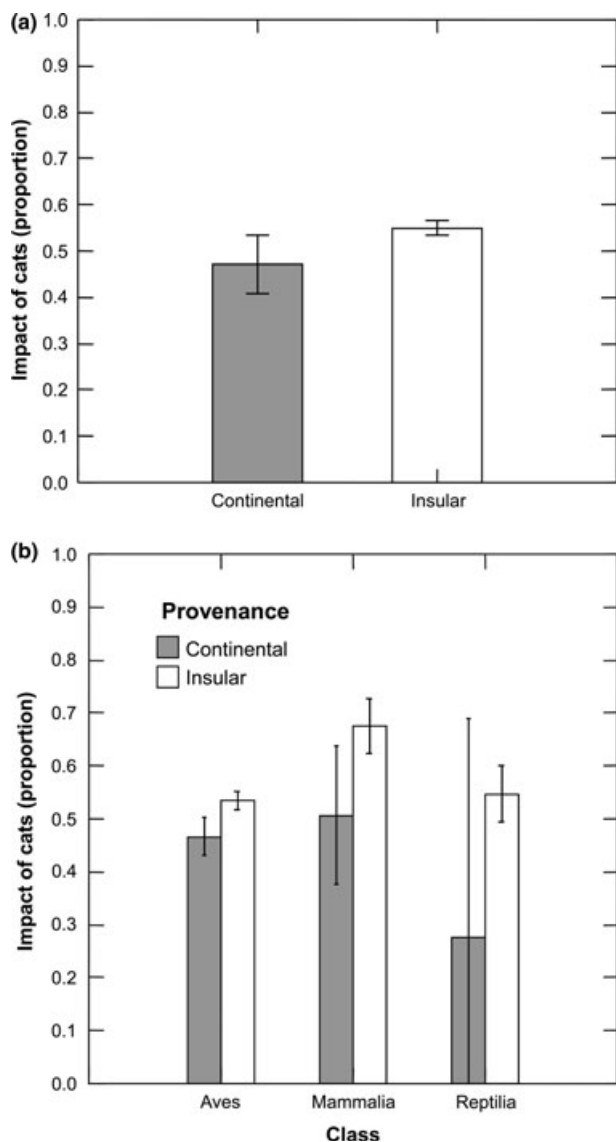


Fig. 4 Effect of provenance (insular endemics vs. continental species) on severity of cat impacts (a) across the three taxonomic classes and (b) by class. Bars are ± 1 SE.

class but did not differ significantly among them (class \times provenance interaction, $P > 0.05$) (Fig. 4b).

To examine the influence of introduced alternate prey species on the severity of cat impacts on native prey, we looked at islands with and without rabbits or mice. We excluded islands with rats from this analysis because rats were both an alternative prey for cats and a predator of native species. Mice too can be predators on insular endemic vertebrates, but were not excluded from the analysis because they are much less significant predators than rats. The presence of alternative prey significantly increased the impact of feral cats on birds, the only class

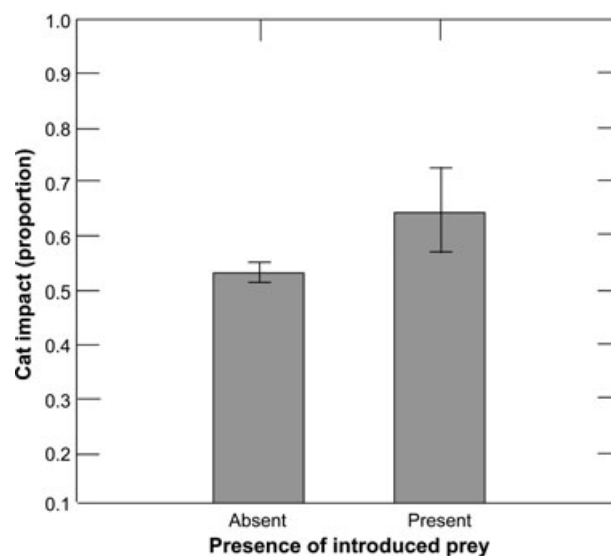


Fig. 5 Effect on cat impact severity of the presence of alternative introduced prey (rabbits or mice). Bars are ± 1 SE. See text for details.

where sample size was large enough for a meaningful test ($N = 166$, ANOVA, $F = 4.24$, $P = 0.041$) (Fig. 5).

The impact of feral cats on islands was not significantly affected by island size, origin (oceanic or land-bridge), or latitude (OLS regressions, $P > 0.05$).

Discussion

This is the first study that attempts to quantify the global impact of an invasive species on insular biodiversity. Our review demonstrates that feral cats have contributed to at least 14% of the modern bird, mammal, and reptile extinctions (Table 2) and have to the endangerment of at least 8% of critically endangered birds, mammals, and reptiles (Fig. 2). These are absolute minimum values because they are derived from our database of studies, yet the impacts of cats on many, perhaps most species, have not been studied. For this same reason, it is difficult to interpret the uneven spatial distribution of studies (Fig. 1), however, we suspect that it is more reflective of research effort than the distribution of actual impacts.

Our meta-analysis suggests that feral cats on islands have the largest negative impacts on insular endemic species, especially endemic mammals (Fig. 4b), and these impacts are exacerbated by the presence of invasive cat prey species such as mice and rabbits as predicted by Courchamp *et al.* (2000) (Fig. 5). Other invasive predatory mammals, such as rats, pigs, mongoose compounded the impacts of cats on native insular species (Townsend *et al.*, 2006; Jones *et al.*, 2008).

Table 2 Taxa driven to global extinction with the direct participation of feral cats on islands

Order	Species	Island	Country
Reptiles (2)	<i>Leiocephalus eremitus</i>	Navassa	West Indies, USA
	<i>Podarcis sicula sanctistephani</i>	San Stephano	Italy
Birds (22)	<i>Anthornis melanocephala</i>	Mangere	New Zealand
	<i>Bowdleria rufescens</i>	Mangere	New Zealand
	<i>Cabalus modestus</i>	Mangere	New Zealand
	<i>Caracara lutosa</i>	Guadalupe	Mexico
	<i>Chaunoproctus ferreirostris</i>	Peel	Japan
	<i>Coenocorypha barrierensis</i>	Little Barrier	New Zealand
		Stewart	New Zealand
		Herekopare	New Zealand
	<i>Colaptes auratus rufipileus</i>	Guadalupe	Mexico
	<i>Corvus hawaiiensis</i>	Hawai'i	Hawai'i, USA
	<i>Cyanoramphus novaezelandiae erythrotis</i>	Macquarie	Australia
	<i>Microgoura meeki</i>	Choiseul	Solomon Islands
	<i>Pipilio maculatus consobrinus</i>	Guadalupe	Mexico
	<i>Porzana sandwichensis</i>	Hawai'i	Hawai'i, USA
	<i>Pterodroma cervicalis cervicalis</i>	Raoul	New Zealand
	<i>Regulus calendula obscurus</i>	Guadalupe	Mexico
	<i>Sceloglaux albifacies</i>	Stewart	New Zealand
	<i>Sephanoides fernandesii leyboldi</i>	Alejandro Selkirk	Chile
	<i>Thryomanes bewickii brevicauda</i>	Guadalupe	Mexico
	<i>Traversia lyalli</i>	Stephens	New Zealand
	<i>Turnagra capensis minor</i>	Stephens	New Zealand
	<i>Xenicus longipes</i>	Stephens	New Zealand
	Kapiti	New Zealand	
	Socorro	Mexico	
	Peel	Japan	
Mammals (9)	<i>Chaetodipus baileyi fornicatus</i>	Dirk Hartog	Australia
	<i>Geocapromys thoracatus</i>	Little Swan	Honduras
	<i>Nesoryzomys darwini</i>	Santa Cruz	Galápagos, Ecuador
	<i>Nesoryzomys indefessus</i>	Santa Cruz	Galápagos, Ecuador
		Baltra	Galápagos, Ecuador
	<i>Oryzomys galapagoensis galapagoensis</i>	San Cristóbal	Galápagos, Ecuador
	<i>Oryzomys nelson</i>	María Madre	Mexico
	<i>Peromyscus guardia harbinsoni</i>	Granito	Mexico
	<i>Peromyscus guardia mejiae</i>	Mejía	Mexico
	<i>Peromyscus maniculatus cineritius</i>	San Roque	Mexico

Insular endemic species are more likely to have lost behavioral, morphological, and life-history defenses against predators than are island populations of species that also occur on continents (Beauchamp, 2004; Fullard *et al.*, 2004; Yamaguchi & Higuchi, 2005). Likewise, cats may affect insular mammals more than birds because nonvolant mammals cannot exchange genetic material as easily as birds can with populations on other islands or the mainland to maintain evolved defenses against predation. The presence of abundant introduced exotic prey has been shown in a number of cases to subsidize introduced predator populations, allowing them to grow and then more severely impact relatively scarce native prey (Courchamp *et al.*, 1999, 2000). This is the case of *Cyanoramphus novaezelandiae erythrotis*, a para-

keet that coexisted on Macquarie Island with cats until rabbits were introduced (Taylor, 1985). Introduced prey subsidies (Roemer *et al.*, 2002) could explain our finding of increased cat impacts on native prey when exotic rodents or rabbits are also present.

Eradication of feral cats from islands is quite feasible on islands under 1000 ha, and eradication attempts from island an order of magnitude larger have been successful, but cats have been eradicated from only two islands >10 000 ha (Nogales *et al.*, 2004). Cat eradication is planned on several islands >10 000 ha (see Campbell *et al.*, 2011). In most of the papers reviewed, different conservation actions were proposed to reduce the impact of feral cats on islands where they were introduced. Of the total conservation priorities, eradication and control of

feral cat populations were the most important actions proposed (31% and 29%, respectively). Cat eradication can result in dramatic recoveries of threatened vertebrates. For example, the iguana (*Cyclura carinata*) in Long Cay, West Indies (Mitchell *et al.*, 2002), the rodent (*Peromyscus pseudocrinitus*) in Coronados Island, Gulf of California (Rodríguez-Moreno *et al.*, 1999), and the bird (*Philesturnus carunculatus rufusater*) in Little Barrier Island, New Zealand (Gillies & Fitzgerald, 2005). Yet there have been fewer than 100 cat eradications from islands (Nogales *et al.*, 2004; Campbell *et al.*, 2011) and there are likely thousands of islands where feral cats negatively impact native vertebrates (B. Tershy, unpublished data). Thus, more effective cat eradication techniques are needed, as are guidelines for selecting islands where cat eradication will have the largest impact. Our review suggests that cats have negative impacts on a wide range of native vertebrates, that endemic island species are particularly vulnerable compared to species that also occur on continents, that endemic island mammals may be the most vulnerable, and that introduced alternate prey species such as mice and rabbits increase the risk to native species.

Conclusions

1. Cats have contributed to a minimum of 14% of all bird, mammal, and reptile extinctions and the decline of at least 8% of critically endangered birds, mammals, and reptiles. Cats can be eradicated from many islands and our results suggest that the most vulnerable species are island endemics, particularly mammals and that introduced alternate prey (rodents and rabbits) increase the impacts of feral cats.
2. Our review undoubtedly underestimated the impact of cats on native species due to the lack of studies on numerous islands of the world and on numerous endangered species particularly in Asia, Indonesia, Polynesia, and Micronesia.
3. Existing studies suffered from uneven geographic coverage of vertebrate orders (e.g. clumping of reptile studies in the Caribbean and mammal studies in the Eastern Pacific) and limited quantification of impacts or controlled experimental design.
4. More research on the impacts of feral cats on island animals can improve these guidelines and thus improve the prioritization of islands for cat eradication.
5. More studies are needed that quantify changes in the survival, reproductive success, or population size of native vertebrates following cat eradication.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

- Appendix S1.** Endangered reptile species affected by the predation of feral cats (*Felis catus*) on islands.
- Appendix S2.** Endangered bird species affected by the predation of feral cats (*Felis catus*) on islands.
- Appendix S3.** Endangered mammal species list affected by the predation of feral cats (*Felis catus*) on islands.
- Appendix S4.** References not listed in main manuscript.

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Appendix S1. Endangered reptile species affected by the predation of feral cats (*Felis catus*) on islands.

Native species affected	Island	Size (km ²)	Region (Ocean/Sea)	IUCN Category †	Biogeographical range ‡	Impact level#	Animal group	Reference
<i>Amblyrhynchus cristatus</i>	Isabela	4590	Galapagos Islands (Pacific)	VU	NAT	MIX	Iguana	Konecny, 1983; Laurie, 1983
	Santa Cruz	986	Galapagos Islands (Pacific)	VU	NAT	MIX	Iguana	Konecny, 1983; Laurie, 1983
<i>Brachylophus fasciatus</i>	Viti Levu	10338	Fiji (Pacific)	EN	NAT	MIX	Iguana	Gibbons, 1984
	Vanua Levu	5587	Fiji (Pacific)	EN	NAT	MIX	Iguana	Gibbons, 1984
	Taveuni	472	Fiji (Pacific)	EN	NAT	MIX	Iguana	Gibbons, 1984
	Yaqaga	24	Fiji (Pacific)	EN	NAT	MIX	Iguana	Gibbons, 1984
	Ovalau	102	Fiji (Pacific)	EN	NAT	MIX	Iguana	Gibbons, 1984
	Kadavu	411	Fiji (Pacific)	EN	NAT	MIX	Iguana	Gibbons, 1984
<i>Brachylophus vitiensis</i>	Matacawa Levu	25	Fiji (Pacific)	CR	NAT	MIX	Iguana	Gibbons, 1984
<i>Chelonia mydas</i>	Ascension*	97	(South Atlantic)	EN	NAT	MIX	Turtle	Ashmole <i>et al.</i> , 1994
	Aldabra	155	Seychelles Islands (Indian)	EN	NAT	MIX	Turtle	Seabrook, 1989; 1990
<i>Cyclura carinata</i>	Pine Cay	3.5	Caicos Bank (Atlantic)	CR	NAT	HIG	Iguana	Iverson, 1978
	Long Cay*	1.1	Caicos Bank (Atlantic)	CR	NAT	STG	Iguana	Mitchell <i>et al.</i> , 2002
<i>Cyclura collei</i>	Jamaica	10991	(Caribbean)	CR	END	MIX	Iguana	Vogel, 2000
<i>Cyclura cornuta cornuta</i>	Hispaniola	27750	(Caribbean)	VU	NAT	MIX	Iguana	Ottenwalder, 2000a
<i>Cyclura cornuta stejnegeri</i>	Mona	56.8	Puerto Rico (Caribbean)	EN	END	HIG	Iguana	Wiewandt & Garcia, 2000
<i>Cyclura cychlura cychlura</i>	Andros	5959	(Caribbean)	EN	END	MIX	Iguana	Buckner & Blair, 2000
<i>Cyclura lewisi</i>	Gran Cayman	196	(Caribbean)	CR	END	MIX	Iguana	Burton, 2000
<i>Cyclura nubila caymanensis</i>	Cayman Brac	38	Lesser Cayman (Caribbean)	CR	NAT	MIX	Iguana	Gerber, 2000
	Little Cayman	28.5	Lesser Cayman (Caribbean)	CR	NAT	MIX	Iguana	Gerber, 2000

<i>Cyclura nubila nubila</i>	Cuba	110922	(Caribbean)	VU	END	MIX	Iguana	Perera, 2000
<i>Cyclura pinguis</i>	Anegada	38	(Caribbean)	CR	END	MIX	Iguana	Mitchell, 2000
<i>Cyclura ricordi</i>	Hispaniola	27750	(Caribbean)	CR	END	MIX	Iguana	Ottenwalder, 2000b
<i>Epicrates subflavus</i>	Jamaica	10991	(Caribbean)	VU	END	MIX	Snake	Mittermeier, 1972; Lever, 1994
<i>Gallotia gomerana</i>	La Gomera	370	Canary Islands (Atlantic)	CR	END	HIG	Lizard	Nogales <i>et al.</i> , 2001
<i>Gallotia intermedia</i>	Tenerife	2034	Canary Islands (Atlantic)	CR	END	HIG	Lizard	Hernández <i>et al.</i> , 2000
<i>Gallotia simonyi</i>	El Hierro	269	Canary Islands (Atlantic)	CR	END	HIG	Lizard	García-Márquez <i>et al.</i> , 1997; 1999; Rodríguez-Domínguez <i>et al.</i> , 1998
<i>Geochelone nigra güntheri</i>	Isabela	4590	Galapagos Islands (Pacific)	VU	END	MIX	Turtle	MacFarland <i>et al.</i> , 1974
<i>Geochelone nigra vicina</i>	Isabela	4590	Galapagos Islands (Pacific)	VU	END	MIX	Turtle	MacFarland <i>et al.</i> , 1974
<i>Geochelone nigra porteri</i>	Santa Cruz	986	Galapagos Islands (Pacific)	VU	END	MIX	Turtle	MacFarland <i>et al.</i> , 1974
<i>Leiocephalus eremitus</i>	Navassa Island	5.2	West Indies (Caribbean)	EX	NAT	MIX	Iguana	Honegger, 1981
<i>Podarcis lilfordi</i>	Cabrera	11.5	Balearic Islands (Mediterranean)	EN	NAT	MIX	Lizard	Clevenger, 1995
<i>Podarcis sicula sanctistephani</i>	San Stefano	0.3	Tyrrhenian Sea (Mediterranean)	LC (EX ssp.)	END	MIX	Lizard	Honegger, 1981
<i>Urosaurus auriculatus</i>	Socorro	132	Revillagigedo, Mexico (Pacific)	EN	END	HIG	Lizard	Rodríguez-Estrella <i>et al.</i> , 1991; Arnaud <i>et al.</i> , 1993; 1994

* Islands where feral cats had been eradicated following Nogales *et al.* (2004) and Campbell *et al.* (2011).

† IUCN categories: LC, less concern; VU, vulnerable; EN, endangered; CR, critically endangered; EX, extinct.

‡ Biogeographical range: NAT, native species; END, endemic species.

Impact level: MIX, mixed; HIG, high; STG, strong (see text for explanation).

Appendix S2. Endangered bird species affected by the predation of feral cats (*Felis catus*) on islands.

Native species affected	Island	Size (km ²)	Region (Ocean/Sea)	IUCN Category †	Biogeographical range ‡	Impact level#	Animal group	Reference
<i>Acrocephalus luscinius</i>	Saipan	115	Marianas Islands (Pacific)	EN	NAT	MIX	Landbird	BirdLife Internacional, 2000
<i>Acrocephalus rodericanus</i>	Rodriguez	109	Mascarenes Islands (Indian)	EN	END	MIX	Landbird	BirdLife Internacional, 2000
<i>Amazona vittata</i>	Puerto Rico	9104	(Caribbean)	CR	END	MIX	Landbird	Engeman <i>et al.</i> , 2006
<i>Anas aucklandica</i>	Auckland	510	New Zealand (Pacific)	VU	NAT	MIX	Waterbird	BirdLife Internacional, 2000
<i>Anas laysanensis</i>	Laysan	4.1	Hawaiian Islands (Pacific)	CR	END	MIX	Waterbird	Winter & Wallace, 2006
<i>Anas wyvilliana</i>	Kaua'i	1430	Hawaiian Islands (Pacific)	EN	NAT	MIX	Waterbird	Winter & Wallace, 2006
<i>Anthornis melanocephala</i>	Mangere*	1.3	New Zealand (Pacific)	EX	NAT	STG	Landbird	Veitch, 1985
<i>Apteryx australis lawryi</i>	Stewart	1746	New Zealand (Pacific)	VU	NAT	MIX	Landbird	BirdLife Internacional, 2000
<i>Bowdleria rufescens</i>	Mangere*	1.3	New Zealand (Pacific)	EX	NAT	STG	Landbird	Veitch, 1985
<i>Branta sandvicensis</i>	Kaua'i	1430	Hawaiian Islands (Pacific)	VU	NAT	MIX	Waterbird	Winter & Wallace, 2006
	Hawai'i	10458	Hawaiian Islands (Pacific)	VU	NAT	MIX	Waterbird	Banko <i>et al.</i> , 2001; Winter & Wallace, 2006
	Maui	1883	Hawaiian Islands (Pacific)	VU	NAT	MIX	Waterbird	Winter & Wallace, 2006
	Moloka'i	673	Hawaiian Islands (Pacific)	VU	NAT	MIX	Waterbird	Winter & Wallace, 2006
<i>Cabalus modestus</i>	Mangere*	1.3	New Zealand (Pacific)	EX	NAT	MIX	Waterbird	Flannery & Schouten, 2001
<i>Camarhynchus pauper</i>	Floreana	173	Galapagos Islands (Pacific)	VU	END	MIX	Landbird	BirdLife Internacional, 2000
<i>Caracara lutosa</i>	Guadalupe	254	Baja California (Pacific)	EX	NAT	STG	Landbird	Keitt <i>et al.</i> , 2006
<i>Chaunoproctus ferreirostris</i>	Peel	24	Japan (Pacific)	EX	END	MIX	Landbird	Flannery & Schouten, 2001

<i>Charadrius obscurus</i>	Stewart	1746	New Zealand (Pacific)	EN	NAT	MIX	Shorebird	Dowding & Murphy, 1993
	Matakana	61	New Zealand (Pacific)	EN	NAT	HIG	Shorebird	Dowding & Murphy, 2001; Wills <i>et al.</i> , 2003
<i>Charadrius sanctaehelenae</i>	St. Helena	425	(Atlantic)	CR	END	MIX	Shorebird	BirdLife International, 2000
<i>Chasiempis sandwichensis</i>	Kaua'i	1430	Hawaiian Islands (Pacific)	EN	NAT	MIX	Landbird	Snetsinger <i>et al.</i> , 1994; Winter & Wallace, 2006
<i>Coenocorypha barrierensis</i>	Little Barrier*	28.2	New Zealand (Pacific)	NT (EX ssp.)	NAT	MIX	Shorebird	Miskelly, 1988; Dowding & Murphy, 2001; Miskelly & Baker, 2009
	Stewart	1746	New Zealand (Pacific)	NT (EX ssp.)	NAT	HIG	Shorebird	Dowding & Murphy, 2001
	Herekopare*	0.3	New Zealand (Pacific)	NT (EX ssp.)	NAT	HIG	Shorebird	Veitch, 1985
<i>Coenocorypha pusilla</i>	Chatham	900	New Zealand (Pacific)	VU	NAT	STG	Shorebird	Dowding & Murphy, 2001
	Pitt	62	New Zealand (Pacific)	VU	NAT	STG	Shorebird	Dowding & Murphy, 2001
	Mangere*	1.3	New Zealand (Pacific)	VU	NAT	STG	Shorebird	Veitch, 1985; Dowding & Murphy, 2001
<i>Colaptes auratus rufipileus</i>	Guadalupe	254	Baja California (Pacific)	LC (EX ssp.)	NAT	STG	Landbird	Keitt <i>et al.</i> , 2006
<i>Copsychus sechellarum</i>	Aride*	0.67	Seychelles (Indian)	EN	NAT	STG	Landbird	Watson <i>et al.</i> , 1992
	Alphonse	1.7	Seychelles (Indian)	EN	NAT	STG	Landbird	Watson <i>et al.</i> , 1992
	Fregate*	2.2	Seychelles (Indian)	EN	NAT	STG	Landbird	Watson <i>et al.</i> , 1992
<i>Corvus hawaiiensis</i>	Hawai'i	10458	Hawaiian Islands (Pacific)	EW	END	MIX	Landbird	Banko <i>et al.</i> , 2001; Winter & Wallace, 2006
<i>Cyanoramphus forbesi</i>	Mangere*	1.3	New Zealand (Pacific)	EN	NAT	MIX	Landbird	BirdLife International, 2000
<i>Cyanoramphus n. novaezelandiae</i>	Little Barrier*	28.2	New Zealand (Pacific)	VU	NAT	MIX	Landbird	Taylor, 1985; Girardet <i>et al.</i> , 2001
<i>Cyanoramphus novaezelandiae cyanurus</i>	Raoul*	29	New Zealand (Pacific)	VU	NAT	STG	Landbird	Cheeseman, 1887 in Karl & Best, 1982; Taylor, 1985
<i>Cyanoramphus novaezelandiae cookii</i>	Norfolk	35	Australia (Pacific)	VU	END	MIX	Landbird	Forshaw, 1980 and

<i>Cyanoramphus novaezelandiae erythrotis</i>	Macquarie *	128	Australia (Sub-Antarctic)	VU (EX ssp.)	NAT	STG	Landbird	Phipps, 1981 in Taylor, 1985 Taylor, 1979
<i>Diomedea amsterdamensis</i>	Amsterdam	55	France (Sub-Antarctic)	CR	END	HIG	Seabird	Jouventin <i>et al.</i> , 1984 BirdLife International, 2000
<i>Diomedea epomophora</i>	Auckland	510	New Zealand (Pacific)	VU	NAT	MIX	Seabird	Taylor, 2000
<i>Ducula galeata</i>	Nuku Hiva	337	French Polynesia (Pacific)	CR	END	MIX	Landbird	Thorsen <i>et al.</i> , 2002
<i>Ducula whartoni</i>	Christmas	134.7	Australia (Indian)	VU	END	MIX	Landbird	Tidemann <i>et al.</i> , 1994
<i>Eudyptes chrysocome</i>	Grande Terre	7200	Kerguelen Islands (Sub-Antarctic)	VU	NAT	MIX	Seabird	Pontier <i>et al.</i> , 2002
	Marion*	290	(Sub-Antarctic)	VU	NAT	MIX	Seabird	Berruti, 1981
<i>Eudyptes chrysocome moseleyi</i>	Amsterdam	55	France (Sub-Antarctic)	VU	NAT	MIX	Seabird	Furet, 1989 but see Jouventin, 1994
<i>Eudyptes chrysolophus</i>	Grande Terre	7200	Kerguelen Islands (Sub-Antarctic)	VU	NAT	MIX	Seabird	Pontier <i>et al.</i> , 2002
<i>Eudyptes pachyrhynchus</i>	Stewart	1746	New Zealand (Pacific)	VU	NAT	MIX	Seabird	BirdLife International, 2000
<i>Eudyptes schlegeli</i>	Macquarie *	128	Australia (Sub-Antarctic)	VU	NAT	MIX	Seabird	BirdLife International, 2000
	Bishop	0.3	Australia (Sub-Antarctic)	VU	NAT	MIX	Seabird	BirdLife International, 2000
	Clerk	0.3	Australia (Sub-Antarctic)	VU	NAT	MIX	Seabird	BirdLife International, 2000
<i>Eulipoa wallacei</i>	Haruku	150	Indonesia (Pacific)	VU	NAT	MIX	Landbird	Heij, 2001
<i>Falco punctatus</i>	Mauritius	2040	Mascarenes Islands (Indian)	VU	END	MIX	Landbird	Cade & Jones, 1993; Jones <i>et al.</i> , 1994
<i>Fregata aquila</i>	Ascension*	97	(South Atlantic)	VU	NAT	HIG	Seabird	Williams, 1984
<i>Fulica alai</i>	Kaua'i	1430	Hawaiian Islands (Pacific)	VU	NAT	MIX	Waterbird	Winter & Wallace, 2006
	Hawai'i	10458	Hawaiian Islands (Pacific)	VU	NAT	MIX	Waterbird	Winter & Wallace, 2006
	Maui	1883	Hawaiian Islands (Pacific)	VU	NAT	MIX	Waterbird	Winter & Wallace, 2006

	Moloka'i	673	Hawaiian Islands (Pacific)	VU	NAT	MIX	Waterbird	Winter & Wallace, 2006
	Kaho'olawe	115.6	Hawaiian Islands (Pacific)	VU	NAT	MIX	Waterbird	Winter & Wallace, 2006
	O'ahu	1545	Hawaiian Islands (Pacific)	VU	NAT	MIX	Waterbird	Winter & Wallace, 2006
	Ni'ihau	181	Hawaiian Islands (Pacific)	VU	NAT	MIX	Waterbird	Winter & Wallace, 2006
<i>Gallicolumba erythroptera</i>	Rangiroa Atoll	79	French Polynesia (Pacific)	CR	NAT	MIX	Landbird	Monnet <i>et al.</i> , 1993; BirdLife International, 2000
<i>Gallinula comeri</i>	Tristan da Cunha*	98	South Atlantic	VU	NAT	MIX	Waterbird	BirdLife International, 2000
<i>Gallinula pacifica</i>	Savai'i	1682	Samoa (Pacific)	CR	END	MIX	Waterbird	Flannery & Schouten, 2001
<i>Gallirallus australis scotii</i>	Macquarie*	128	Australia (Sub-Antarctic)	VU	NAT	MIX	Waterbird	Jones, 1977; 1980
<i>Gallirallus sylvestris</i>	Lord Howe	56	Australia (Pacific)	EN	END	HIG	Waterbird	BirdLife International, 2000
<i>Hemignathus kauaiensis</i>	Kaua'i	1430	Hawaiian Islands (Pacific)	VU	END	MIX	Landbird	Winter & Wallace, 2006
<i>Hemignathus munroi</i>	Hawai'i	10458	Hawaiian Islands (Pacific)	EN	END	MIX	Landbird	BirdLife International, 2000
<i>Lathamus discolor</i>	Tasmania	68332	Australia (Pacific)	EN	END	MIX	Landbird	Copson, 1991
<i>Loxioides bailleui</i>	Hawai'i	10458	Hawaiian islands (Pacific)	EN	END	MIX	Landbird	Pletschet & Kelly, 1990; Banko <i>et al.</i> , 2001; Winter & Wallace, 2006
<i>Loxops coccineus</i>	Kaua'i	1430	Hawaiian Islands (Pacific)	EN	NAT	MIX	Landbird	Winter & Wallace, 2006
<i>Megadyptes antipodes</i>	Stewart	1746	New Zealand (Pacific)	EN	NAT	HIG	Seabird	Massaro & Blair, 2003
<i>Megapodius laperouse</i>	Saipan	115	Marianas Islands (Pacific)	EN	END	MIX	Landbird	BirdLife International, 2000
<i>Megapodius pritchardii</i>	Niufo'ou	25	Tonga (Pacific)	EN	END	MIX	Landbird	BirdLife International, 2000
<i>Microgoura meeki</i>	Choiseul	3294	Solomon Islands (Pacific)	EX	END	STG	Landbird	Flannery & Schouten, 2001
<i>Mimus graysoni</i>	Socorro	132	Revillagigedo, Mexico (Pacific)	CR	END	HIG	Landbird	Jehl & Parkes, 1983; Arnould <i>et al.</i> 1994

<i>Myadestes obscurus</i>	Hawai'i	10458	Hawaiian Islands (Pacific)	VU	END	MIX	Landbird	Martínez-Gómez & Curry, 1996; Martínez-Gómez & Jacobsen, 2004
<i>Myadestes palmeri</i>	Kaua'i	1430	Hawaiian Islands (Pacific)	CR	END	MIX	Landbird	Smucker <i>et al.</i> , 2000
<i>Neophema chrysogaster</i>	Tasmania	68332	Australia (Pacific)	CR	END	MIX	Landbird	Winter & Wallace, 2006
<i>Nesoenas mayeri</i>	Mauritius	2040	Mascarenes Islands (Indian)	EN	NAT	MIX	Landbird	Copson, 1991
<i>Nestor meridionalis septentrionalis</i>	Little Barrier*	28.2	New Zealand (Pacific)	EN	NAT	MIX	Landbird	BirdLife International, 2000
<i>Notiomystis cincta</i>	Little Barrier*	28.2	New Zealand (Pacific)	VU	NAT	HIG	Landbird	Marshall, 1961
<i>Numenius tahitiensis</i>	Easter	164	Chile (Pacific)	VU	NAT	HIG	Shorebird	Veitch, 1985
	Nauru	21	Southern Pacific	VU	NAT	HIG	Shorebird	BirdLife International, 2000
	Niue	269	Southern Pacific	VU	NAT	HIG	Shorebird	BirdLife International, 2000
	Norfolk	35	Australia (Pacific)	VU	NAT	HIG	Shorebird	BirdLife International, 2000
	Rangiroa Atoll	43	French Polynesia (Pacific)	VU	NAT	HIG	Shorebird	BirdLife International, 2000
<i>Oceanodroma homochroa</i>	Coronado Norte*	0.5	Baja California (Pacific)	EN	NAT	MIX	Seabird	Gill & Redmond, 1992
<i>Oceanodroma macrodactyla</i>	Guadalupe	254	Baja California (Pacific)	CR	NAT	STG	Seabird	McChesney & Tershy, 1998
<i>Oreomystis bairdi</i>	Kaua'i	1430	Hawaiian Islands (Pacific)	CR	NAT	MIX	Landbird	Jehl, 1972; Keitt <i>et al.</i> , 2006
<i>Palmeria dolei</i>	Maui	1883	Hawaiian Islands (Pacific)	CR	NAT	MIX	Landbird	Winter & Wallace, 2006
<i>Pardalotus quadragintus</i>	Tasmania	68332	Australia (Pacific)	EN	END	MIX	Landbird	BirdLife International, 2000
<i>Paroreomyza montana</i>	Maui	1883	Hawaiian Islands (Pacific)	EN	END	MIX	Landbird	Copson, 1991
<i>Pelecanoides garnotii</i>	El Fronton	0.5	Peru (Pacific)	EN	NAT	MIX	Seabird	Kowalsky <i>et al.</i> , 2002
	San Lorenzo	17.6	Peru (Pacific)	EN	NAT	MIX	Seabird	BirdLife International, 2000

<i>Petroica traversi</i>	Mangere*	1.3	New Zealand (Pacific)	EN	NAT	HIG	Landbird	Veitch, 1985
<i>Phalacrocorax colensoi</i>	Auckland	510	New Zealand (Pacific)	VU	END	MIX	Seabird	Taylor, 2000
<i>Phalacrocorax featherstoni</i>	Chatham	900	New Zealand (Pacific)	EN	NAT	MIX	Seabird	Taylor, 2000
	Pitt	62	New Zealand (Pacific)	EN	NAT	MIX	Seabird	Taylor, 2000
<i>Phalacrocorax onslowi</i>	Chatham	900	New Zealand (Pacific)	CR	END	MIX	Seabird	Taylor, 2000
<i>Phoebastria immutabilis</i>	Guadalupe	254	Baja California (Pacific)	VU	NAT	MIX	Seabird	Keitt <i>et al.</i> , 2006
<i>Phoebastria irrorata</i>	Isla de la Plata*	7	Ecuador (Pacific)	CR	NAT	MIX	Seabird	BirdLife International, 2000
<i>Pipilo maculatus consobrinus</i>	Guadalupe	254	Baja California (Pacific)	LC (EX ssp.)	NAT	STG	Landbird	Keitt <i>et al.</i> , 2006
<i>Pomarea mendozae montanensis</i>	Moho Tani	15	French Polynesia (Pacific)	EN	END	MIX	Landbird	BirdLife International, 2000
<i>Porzana sandwichensis</i>	Hawai'i	10458	Hawaiian Islands (Pacific)	EX	END	MIX	Waterbird	Flannery & Schouten, 2001
<i>Procellaria aequinoctialis</i>	Marion *	290	(Sub-Antarctic)	VU	NAT	MIX	Seabird	van Aarde, 1980; van Rensburg, 1985; van Rensburg & Bester, 1988; Bloomer & Bester, 1990
	Grande Terre	7200	Kerguelen Islands (Sub-Antarctic)	VU	NAT	MIX	Seabird	Derenne, 1976; Pontier <i>et al.</i> , 2001; 2002
	Cochons	70	Crozet Islands (Sub-Antarctic)	VU	NAT	MIX	Seabird	Jouventin <i>et al.</i> , 1984
	Campbell*	115	New Zealand (Pacific)	VU	NAT	MIX	Seabird	Taylor, 2000
	Auckland	510	New Zealand (Pacific)	VU	NAT	MIX	Seabird	Taylor, 2000
<i>Procellaria parkinsoni</i>	Great Barrier	285	New Zealand (Pacific)	VU	NAT	MIX	Seabird	Imber, 1975; Atkinson & Atkinson, 2000
	Little Barrier*	28.2	New Zealand (Pacific)	VU	NAT	HIG	Seabird	Veitch, 1985; Imber, 1987
<i>Pseudobulweria aterrima</i>	Reunion	2512	Mascarenes Islands (Indian)	CR	END	MIX	Seabird	BirdLife International, 2000
<i>Pseudobulweria macgillivrayi</i>	Gau	136	Fiji (Pacific)	CR	END	HIG	Seabird	BirdLife International, 2000
<i>Pterodroma alba</i>	Christmas	135	Australia (Indian)	EN	NAT	MIX	Seabird	BirdLife International, 2000

<i>Pterodroma arminjoniana</i>	South Trinidad*	18	Brazil (South Atlantic)	VU	NAT	MIX	Seabird	Williams, 1984
<i>Pterodroma atrata</i>	Henderson	37	Pitcairn Islands (Pacific)	EN	END	HIG	Seabird	BirdLife International, 2000
<i>Pterodroma axillaris</i>	Chatham	900	New Zealand (Pacific)	CR	NAT	HIG	Seabird	Taylor, 2000
	Mangere*	1.3	New Zealand (Pacific)	CR	NAT	STG	Seabird	Taylor, 2000
	Pitt	62	New Zealand (Pacific)	CR	NAT	STG	Seabird	Taylor, 2000
<i>Pterodroma barau</i>	Reunion	2150	(Indian)	EN	END	HIG	Seabird	Faulquier <i>et al.</i> , 2009
<i>Pterodroma cervicalis cervicalis</i>	Raoul*	29	New Zealand (Pacific)	VU (EX ssp.)	NAT	MIX	Seabird	Taylor, 2000
<i>Pterodroma cookii</i>	Little Barrier*	28.2	New Zealand (Pacific)	EN	NAT	MIX	Seabird	Imber, 1975; Girardet <i>et al.</i> , 2001; Rayner <i>et al.</i> , 2007
<i>Pterodroma defilippiana</i>	Robinson Crusoe	93	Chile (Pacific)	VU	NAT	HIG	Seabird	BirdLife International, 2000
	San Felix	6	Chile (Pacific)	VU	NAT	HIG	Seabird	BirdLife International, 2000
<i>Pterodroma externa</i>	Alejandro Selkirk	33	Chile (Pacific)	VU	END	MIX	Seabird	BirdLife International, 2000
<i>Pterodroma longirostris</i>	Alejandro Selkirk	33	Chile (Pacific)	VU	END	HIG	Seabird	BirdLife International, 2000
<i>Pterodroma madeira</i>	Madeira	741	(Atlantic)	EN	NAT	MIX	Seabird	BirdLife International, 2000
<i>Pterodroma magentae</i>	Chatham	900	New Zealand (Pacific)	CR	END	HIG	Seabird	Bell & Robertson, 1994; Crockett, 1994
<i>Pterodroma phaeopygia</i>	Floreana	173	Galapagos Islands (Pacific)	CR	NAT	MIX	Seabird	Coulter, 1984; Coulter <i>et al.</i> , 1985; Cruz & Cruz, 1987; Tomkins, 1985
	San Cristóbal	558	Galapagos Islands (Pacific)	CR	NAT	MIX	Seabird	Tomkins, 1985
	Santa Cruz	986	Galapagos Islands (Pacific)	CR	NAT	MIX	Seabird	Cruz & Cruz, 1987
<i>Pterodroma sandwichensis</i>	Hawai'i	10458	Hawaiian Islands (Pacific)	VU	NAT	MIX	Seabird	Hu <i>et al.</i> , 2001; Winter & Wallace, 2006
	Maui	1883	Hawaiian Islands (Pacific)	VU	NAT	MIX	Seabird	Hodges & Nagata, 2001; Winter & Wallace, 2006
<i>Pterodroma solandri</i>	Lord Howe	56	New Zealand (Pacific)	VU	NAT	MIX	Seabird	Miller & Mullette, 1985;

<i>Ptilinopus rarotongensis</i>	Aitutaki	18.1	Cook Islands (Pacific)	VU	END	MIX	Landbird	BirdLife International, 2000 Steadman, 1991
<i>Puffinus auricularis</i>	Socorro	132	Revillagigedo, Mexico (Pacific)	CR	NAT	MIX	Seabird	Martínez-Gómez & Curry, 1996; Martínez-Gómez & Jacobsen, 2004
<i>Puffinus creatopus</i>	Mocha	48	Chile (Pacific)	VU	NAT	MIX	Seabird	BirdLife International, 2000
	Robinson Crusoe	93	Chile (Pacific)	VU	NAT	MIX	Seabird	BirdLife International, 2000
<i>Puffinus mauretanicus</i>	Menorca	964	Balearic Islands (Mediterranean)	CR	NAT	HIG	Seabird	Arcos & Oro, 2004
<i>Puffinus newelli</i>	Kaua'i	1430	Hawaiian Islands (Pacific)	EN	NAT	MIX	Seabird	Ainley <i>et al.</i> , 2001; Winter & Wallace, 2006
	Hawai'i	10458	Hawaiian Islands (Pacific)	EN	NAT	MIX	Seabird	Winter & Wallace, 2006
	Moloka'i	673	Hawaiian Islands (Pacific)	EN	NAT	MIX	Seabird	Winter & Wallace, 2006
<i>Regulus calendula obscurus</i>	Guadalupe	254	Baja California (Pacific)	LC (EX ssp.)	NAT	STG	Landbird	Keitt <i>et al.</i> , 2006
<i>Sapheopipo noguchii</i>	Okinawa	1201	Japan (Pacific)	CR	END	HIG	Landbird	Jogahara <i>et al.</i> , 2003
<i>Sceloglaux albifacies</i>	Stewart	1746	New Zealand (Pacific)	EX	NAT	MIX	Landbird	BirdLife International, 2000
<i>Sephanoides fernandensis fernandensis</i>	Robinson Crusoe	93	Chile (Pacific)	CR	END	MIX	Landbird	BirdLife International, 2000
<i>Sephanoides fernandensis leyboldi</i>	Alejandro Selkirk	33	Chile (Pacific)	EX	END	MIX	Landbird	BirdLife International, 2000
<i>Spheniscus demersus</i>	Dassen*	2.2	(Sub-Antarctic)	VU	NAT	MIX	Seabird	Cooper, 1977; Apps, 1983; Berruti, 1986
<i>Spheniscus mendiculus</i>	Isabela	4590	Galapagos Islands (Pacific)	EN	NAT	MIX	Seabird	BirdLife International, 2000
<i>Strigops habroptilus</i>	Stewart	1746	New Zealand (Pacific)	CR	NAT	HIG	Landbird	BirdLife International, 2000
<i>Synthliboramphus hypoleucus</i>	Coronado Norte*	0.5	Baja California (Pacific)	VU	NAT	MIX	Seabird	McChesney & Tershy, 1998
<i>Thalassarche carteri</i>	Amsterdam	55	France (Sub-Antarctic)	EN	NAT	MIX	Seabird	BirdLife International, 2000

<i>Thalassarche chlororhynchus</i>	Amsterdam	55	France (Sub-Antarctic)	EN	NAT	MIX	Seabird	Furet, 1989 but see Jouventin, 1994
<i>Thinornis novaeseelandiae</i>	Chatham	900	New Zealand (Pacific)	EN	NAT	HIG	Shorebird	Dowding & Murphy, 2001
	Pitt	62	New Zealand (Pacific)	EN	NAT	HIG	Shorebird	Dowding & Murphy, 2001
	Mangere*	1.3	New Zealand (Pacific)	EN	NAT	STG	Shorebird	Dowding & Murphy, 2001
<i>Thryomanes bewickii brevicauda</i>	Guadalupe	254	Baja California (Pacific)	LC (EX ssp.)	NAT	STG	Landbird	Keitt <i>et al.</i> , 2006
<i>Traversia lyalli</i>	Stephens*	1.5	New Zealand (Pacific)	EX	END	STG	Landbird	Veitch 1985; Medway, 2004
<i>Turdus celanops</i>	Izu Islands	300	Japan (Pacific)	VU	NAT	MIX	Landbird	BirdLife International, 2000
<i>Turnagra capensis minor</i>	Stephens*	1.5	New Zealand (Pacific)	EX	END	STG	Landbird	Veitch, 1985; Medway, 2004
<i>Xenicus longipes</i>	Stephens*	1.5	New Zealand (Pacific)	EX	NAT	STG	Landbird	Medway, 2004
	Kapiti*	19.6	New Zealand (Pacific)	EX	NAT	STG	Landbird	Miskelly, 2003
<i>Zenaida graysoni</i>	Socorro	132	Revillagigedo, Mexico (Pacific)	EW	END	STG	Landbird	Jehl & Parkes, 1983; Rodríguez-Estrella <i>et al.</i> , 1991
<i>Zoothera terrestris</i>	Peel	24	Japan (Pacific)	EX	END	MIX	Landbird	Flannery & Schouten, 2001
<i>Zoothera turipavae</i>	Guadalcanal	6500	Solomon Islands (Pacific)	VU	END	MIX	Landbird	BirdLife International, 2000
<i>Zosterops natalis</i>	Christmas	134.7	Australia (Indian)	VU	END	MIX	Landbird	Tidemann <i>et al.</i> , 1994

* Islands where feral cats had been eradicated following Nogales *et al.* (2004) and Campbell *et al.* (2011).

† IUCN categories: LC, least concern; NT, near threatened; VU, vulnerable; EN, endangered; CR, critically endangered; EW, extinct in the wild; EX, extinct.

‡ Biogeographical range: NAT, native species; END, endemic species.

Impact level: MIX, mixed; HIG, high; STG, strong (see text for explanation).

Appendix S3. Endangered mammal species list affected by the predation of feral cats (*Felis catus*) on islands.

Native species affected	Island	Size (km ²)	Region (Ocean/Sea)	IUCN Category †	Biogeographical range ‡	Impact level#	Animal group	Reference
<i>Chaetodipus baileyi fornicatus</i>	Montserrat*	19.4	Baja California (Pacific)	LR (EX ssp.)	NAT	STG	Rodent	Álvarez-Castañeda & Cortés-Calva, 2002; Álvarez-Castañeda & Ortega-Rubio, 2003
<i>Dasyercus cristicauda</i>	Dirk Hartog	543	Australia (Indian)	VU	NAT	MIX	Marsupial	Dickman, 1996
<i>Dasyurus geoffroii</i>	Dirk Hartog	543	Australia (Indian)	VU	NAT	MIX	Marsupial	Dickman, 1996
<i>Dasyurus maculatus</i>	Kangaroo	435	Australia (Pacific)	VU	NAT	MIX	Marsupial	Dickman, 1996
<i>Dipodomys insularis</i>	San José	194	Baja California (Pacific)	CR	END	HIG	Rodent	Álvarez-Castañeda & Ortega-Rubio, 2003; Espinosa-Gayosso & Álvarez-Castañeda, 2006
<i>Geocapromys thoracatus</i>	Little Swan	0.5	(Caribbean)	EX	NAT	HIG	Rodent	Morgan, 1989; Flannery & Schouten, 2001
<i>Isoodon auratus</i>	Hermite*	10.2	Montebello Islands (Indian)	VU	NAT	MIX	Marsupial	Burbidge, 2004
<i>Lagostrophus fasciatus</i>	Dirk Hartog	543	Australia (Indian)	VU	NAT	MIX	Marsupial	Dickman, 1996
<i>Leporillus conditor</i>	Dirk Hartog	543	Australia (Indian)	EN	NAT	MIX	Rodent	Dickman, 1996
	Reevesby*	0.3	Australia (Pacific)	EN	NAT	MIX	Rodent	Dickman, 1996
<i>Myotis vivesi</i>	Estanque*	0.6	Baja California (Pacific)	VU	NAT	MIX	Bat	Vázquez-Domínguez <i>et al.</i> , 2004
<i>Neotoma anthonyi</i>	Todos Santos N.*	1.0	Baja California (Pacific)	EN	NAT	STG	Rodent	Mellink, 1992
	Todos Santos S.*	3.0	Baja California (Pacific)	EN	NAT	STG	Rodent	Mellink, 1992
<i>Neotoma bukeri</i>	Coronados*	8.5	Baja California (Pacific)	EN	NAT	STG	Rodent	Álvarez-Castañeda & Ortega-Rubio, 2003
<i>Nesoryzomys darwini</i>	Santa Cruz	986	Galapagos Islands (Pacific)	EX	NAT	MIX	Rodent	Dowler <i>et al.</i> , 2000
<i>Nesoryzomys indefessus</i>	Santa Cruz	986	Galapagos Islands (Pacific)	EX	NAT	MIX	Rodent	Dowler <i>et al.</i> , 2000

	Baltra*	27	Galapagos Islands (Pacific)	EX	NAT	MIX	Rodent	Dowler <i>et al.</i> , 2000
<i>Oryzomys galapagoensis galapagoensis</i>	San Cristóbal	558	Galapagos Islands (Pacific)	VU (EX ssp.)	NAT	MIX	Rodent	Dowler <i>et al.</i> , 2000
<i>Oryzomys nelsoni</i>	María Madre	145	Mexico (Pacific)	EX	END	MIX	Rodent	Flannery & Schouten 2001
<i>Parantechinus apicalis</i>	Dirk Hartog	543	Australia (Indian)	EN	NAT	MIX	Marsupial	Dickman, 1996
<i>Perameles bouganville</i>	Dirk Hartog	543	Australia (Indian)	EN	NAT	MIX	Marsupial	Dickman, 1996
<i>Perameles gunni gunni</i>	Tasmania	68332	Australia (Pacific)	VU	NAT	MIX	Marsupial	Copson 1991
<i>Peromyscus guardia harbinsoni</i>	Granito	0.4	Baja California (Pacific)	LR (EX ssp.)	NAT	STG	Rodent	Mellink <i>et al.</i> , 2002; Álvarez-Castañeda & Ortega-Rubio, 2003
<i>Peromyscus guardia mejiae</i>	Mejía*	3.0	Baja California (Pacific)	LR (EX ssp.)	NAT	STG	Rodent	Álvarez-Castañeda & Ortega-Rubio, 2003
<i>Peromyscus maniculatus cineritius</i>	San Roque*	0.38	Baja California (Pacific)	LR (EX ssp.)	NAT	STG	Rodent	Álvarez-Castañeda & Cortés-Calva, 1996
<i>Peromyscus pseudocrinurus</i>	Coronados*	8.5	Baja California (Pacific)	CR	NAT	MIX	Rodent	Rodríguez-Moreno <i>et al.</i> , 1999; 2007
<i>Propithecus verreauxi</i>	Madagascar	587041	(Indian)	VU	NAT	MIX	Primates	Brockman <i>et al.</i> , 2008
<i>Pseudomys fieldi</i>	Dirk Hartog	543	Australia (Indian)	CR	NAT	MIX	Rodent	Dickman, 1996
<i>Solenodon cubanus</i>	Cuba	110922	(Caribbean)	EN	END	MIX	Insectivore	Lever, 1994
<i>Solenodon paradoxus</i>	Hispaniola	27750	Haiti (Caribbean)	EN	END	MIX	Insectivore	Lever, 1994

* Islands where feral cats had been eradicated following Nogales *et al.* (2004) and Campbell *et al.* (2011).

† IUCN categories: LR, lower risk; VU, vulnerable; EN, endangered; CR, critically endangered; EW, extinct in the wild; EX, extinct.

‡ Biogeographical range: NAT, native species; END, endemic species.

Impact level: MIX, mixed; HIG, high; STG, strong (see text for explanation).

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