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Research Article

Vertebrates as victims of domestic cats and dogs: ten years of data from an Italian animal rescue centre (2015–2024)

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Abstract

Regional wildlife rescue centres maintain annual records that provide information essential for estimating the impact of domestic animals on wildlife populations. In particular, the Campomorone Rescue Centre (CRAS) in Genoa (north-western Italy) serves the entire territory of Liguria (nearly 5,400 km^2) and some nearby areas of southern Piedmont. Quantitative analyses of data collected by CRAS over a ten-year period (2015–2024) indicate that, of the 15,352 wild vertebrates hospitalised for treatment, 954 were known to be injured by cats or dogs. More specifically, it concerns 695 birds, 57 bats, 192 non-flying mammals and 10 reptiles. Reptiles, birds (above all passerines) and bats are mainly prey for cats, while dogs preferentially attack non-flying mammals. As reported in several other studies, the incidence of predation by cats was significantly higher than by dogs: 810 and 144 wild vertebrates, respectively. This figure suggests a gross under-reporting of the impact that cats and dogs have on wildlife populations. Moreover, considering the relatively small regional areas of Liguria and south Piedmont, the CRAS records further understate the real extent of predation by cats and dogs across Italy.

Italy's rescue centres provide a vital network for monitoring the impacts of domestic and feral animals on wildlife. Domestic cats and dogs not only injure and kill wild animals, they also destroy eggs and nests and transmit diseases, all of which can contribute to a decrease in the biodiversity and 'genetic fitness' of wildlife populations. Therefore, wildlife species would greatly benefit from the development and implementation of policies and educational programmes designed to increase awareness of the value of wildlife for healthy ecosystems amongst the general populace, particularly pet owners.

Key words: Bats, birds, fatal injuries, non-flying mammals, predation, reptiles, wildlife conservation

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Introduction

Within the last 10–15 years, several studies have reported on the impact of cats and dogs on wildlife populations (Loss et al. 2013, 2022; Trouwborst et al. 2020; Turner 2022; Lepczyk et al. 2023; Packer et al. 2023; Kaplan 2025; Weng et al. 2024) with these predators responsible for one of the main reasons why the conservation of vulnerable wildlife species is of such concern to people and governments globally. In Italy, for example, this problem has been focused on by Ancillotto et al. (2013), Mori et al. (2019), Costanzi et al. (2021) and Dessalvi et al. (2021). It is therefore clear that this country, within the Mediterranean Basin biodiversity hotspot (Myers et al. 2000), is not exempt from the problem. In Italy, there are 13,863,734 microchipped dogs (data February 2023, source https://vitadacani.info), 285,716 of which are in Liguria. Furthermore, there are nearly 1.2 million domestic cats registered in Italy, of which 7,617 are in Liguria (data 2022, source www.legambiente.it). In addition, there are approximately one million stray cats (feline colonies) and an undetermined number of stray dogs present on the national territory.

Wildlife rescue centres are widespread worldwide and their goal is the rehabilitation of wildlife. In Italy, there are about a hundred rescue centres (CRAS) serving individual provinces or entire regions; these are managed by public or private entities (https://elencocras.it/). The Campomorone CRAS in Genoa (north-western Italy) serves the entire territory of Liguria (nearly 5,400 km^2) and some nearby areas of southern Piedmont, for a total of approximately 2% of the national territory. For a detailed analysis of the activities carried out at the centre and the related operating standards, please refer to Dessalvi et al. (2021). This paper reports on the outcomes of a study of Genoa CRAS's records database after undertaking a detailed analysis of the degree of mortality of wild vertebrates from predation attempts by domestic cats and dogs in Liguria and southern Piedmont regions of north-western Italy.

Materials and methods

The Genoese CRAS, located in the Campomorone area of Genoa Municipality, has been active since 2015 and is the only organisation authorised to recover, rehabilitate and relocate injured wild vertebrates throughout the Genoa hinterland and the whole Liguria Region. The centre is managed by the National Animal Protection Agency (ENPA – www.enpa.it). It consists of a main complex including a veterinary clinic, an area for welcoming the public and a series of rooms where animals are housed with 'batteries' for small species and 'housings' for larger ones and a rehabilitation fenced area located about two kilometres away in an isolated woodland. The CRAS staff is made up of veterinarians and collaborators with a good level of knowledge of animals (mostly graduates in Biology and Natural History). The operating procedures followed from the moment of admission until the eventual release into the wild comply with international standards in this field (see Dessalvi et al. (2021)).

The CRAS database records on MS Excel from 2015 to 2024 were examined. One field of the dataset concerns the reasons for hospitalisation of the specimens, defined on the basis of direct observations by people responsible for the recovery and/or an analysis of the injuries by the Centre's veterinarians. Data on wildlife hospitalised for injuries due to predation attempts by cats and dogs were selected for further analyses. There were no records of predation by pets in the data collected during the first two years (2015–1016). In some cases, the generic term "predation" was reported as a cause of hospitalisation, but, as in numerous similar cases in subsequent years, these data were not included in the analyses as a precaution, even though many of them were likely due to attacks by dogs and cats. The species involved are identified in Appendix 1 and, for completeness of information, they have been integrated with those listed in Appendix 2, which includes vertebrates from the same area (Liguria and southern Piedmont) that were killed by domestic cats and deposited at the local Natural History Museum. The trend over the years and the monthly phenology of admissions of wild vertebrates preyed upon by domestic cats and dogs was outlined. Moreover, an analysis was conducted on the age of victims of attacks by dogs and cats by dividing them into juveniles and adults. Frequencies of the two age classes were compared by means of the χ^2 test using the software PAST (Hammer et al. 2001). Furthermore, in order to assess the severity of injuries due to attacks by domestic animals and the related impact on the conservation of wild vertebrate populations, a comparative analysis was conducted of the outcomes of hospital admissions following predation attempts by cats and dogs. A statistical comparison between the mortality rate due to predation by "domestic animals" and the cumulative rate recorded at CRAS following hospital admissions for other causes was conducted by means of the χ^2 test using the software PAST. For further information on the general trend of outcomes at the CRAS in Genoa, please refer to Dessalvi et al. (2021).

Results

Across a decade of records (2015–2024), a total of 15,352 wild vertebrates were received by the Genoa-Campomorone Rescue Centre. In particular, 19 were amphibians (15 Anura and 4 Urodela), 77 reptiles (Squamata), 12,419 birds and 2,837 mammals. Birds were dominated by the orders Passeriformes (4,729), Caprimulgiformes (2,794), Charadriiformes (1,570), Columbiformes (945) and Anseriformes (893). The most abundant mammal orders were Erinaceomorpha (778), Cetarctiodactyla (758), Chiroptera (620) and Rodentia (397). Of all individuals hospitalised at CRAS during the decade-long study, only 954 wild vertebrates (695 birds, 249 mammals, 10 reptiles) were hospitalised for treatment after suffering predation by domestic cats and dogs (including those feral), (see Appendix 1), which represents only 6.2% of the total for the same period. The most affected species were the Blackbird *Turdus merula* (196), the Eurasian collared dove *Streptopelia decaocto* (145) and the Hedgehog *Erinaceus europaeus* (52). In addition, 15 birds, 13 mammals and one reptile were killed by domestic cats and preserved at the Natural History Museum of Genoa over a different period of time (25 years) (Appendix 2). The trend over the years of hospitalisations at CRAS following predation by cats and dogs, after a sharp increase in the second and third year, fluctuates around an average value of 130–140 individuals per year (136.7 ± 26.3) (Fig. 1). The monthly phenology of birds and bats shows an almost unimodal trend with a peak between May and July and between June and August, respectively. For non-flying mammals, two peaks are observed in May-June and August-September (Fig. 2).

Cats are responsible for a significantly higher number of wildlife injuries than dogs: 810 and 144, respectively. Reptiles, birds (above all passerines) and bats are mainly prey for cats, while dogs mainly attack non-flying mammals. In the case of dogs, juveniles (59.7%) were more affected than adults (Appendix 1 and Table 1 – χ^2 5.4444, 1 d.f., $p < 0.05$, Monte Carlo $p = 0.0226$). The species that contribute most to this imbalance towards juveniles are the Hedgehog and the Eastern cottontail *Sylvilagus floridanus*.

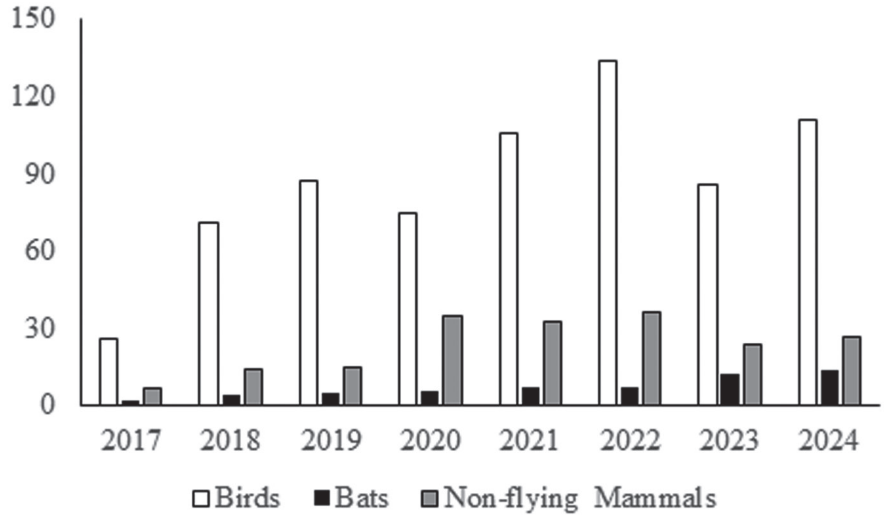

Figure 1. Trend of hospitalisations at CRAS due to predation by cats and dogs. Reptiles have been omitted due to their small numbers.

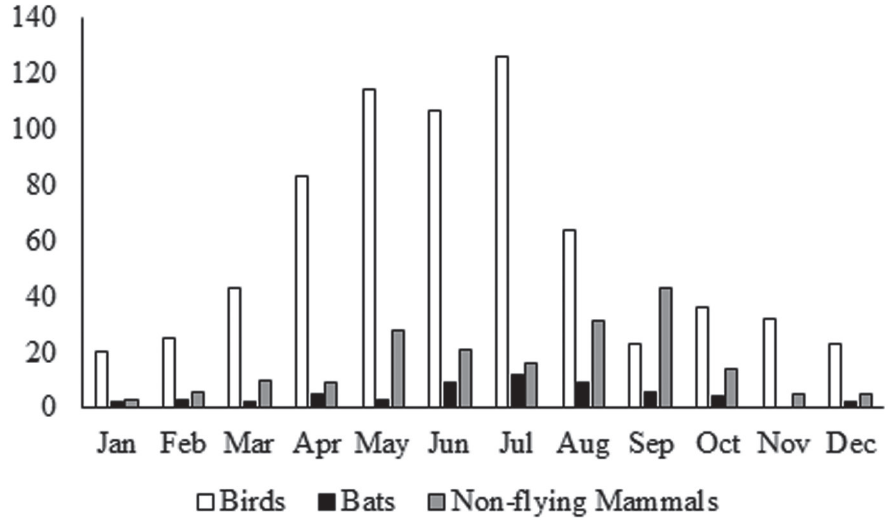

Figure 2. Monthly phenology of hospitalisations at CRAS due to predation by cats and dogs. Reptiles have been omitted due to their small numbers.

The comparison of the outcomes of admissions at CRAS due to predation by domestic cats and dogs and all other cumulative causes, shows a significantly higher mortality rate in the first case (χ^2 29.2, 3 d.f., $p < 0.01$, Monte Carlo $p = 0.001$). After predation attempts by domestic cats and dogs, 75.8% of the wildlife victims died, while the mortality of the wildlife admitted at CRAS for reasons other than victims of predation was only 38.9% (Table 2). Although cats killed more animals (78.81%) than dogs (72.06%) (see Fig. 3), the difference between the mortality rate of the two predators was not statistically significant (χ^2 0.99, 1 d.f., $p = 0.32$, Fisher's exact test $p = 0.41$).

Finally, a significant number of cases examined concern species of some conservation interest. Collectively, the data from Appendices 1 and 2, show that five reptiles and 57 bats belong to species listed in the "Habitats" Directive - Annex IV and five birds belong to species listed in the "Birds" Directive - Annex I.

Table 1. Vertebrates admitted to the CRAS preyed upon by domestic cats and dogs, by age (Juv = juveniles, Ad = adults). For further details, see Appendix 1.

Class	Order	Cats		Dogs	
		Juv	Ad	Juv	Ad
Reptilia	Squamata	3	6		1
Aves	Galliformes		9		1
	Columbiformes	70	77	3	2
	Caprimulgiformes	15	10		1
	Strigiformes	10		1	
	Bucerotiformes		10		
	Piciformes	4	14		
	Passeriformes	241	192	10	8
	Others	8	5	1	3
Mammalia	Erinaceomorpha	2		33	17
	Soricomorpha		4		
	Chiroptera	11	44	1	1
	Carnivora	4	1	6	2
	Cetartiodactyla			20	20
	Rodentia	42	14	2	1
	Lagomorpha	14		9	1

Table 2. Comparison of the outcomes (expressed as a percentage) of admissions at CRAS due to predation by domestic cats and dogs and all other cumulative causes (column "Other" includes specimens still hospitalised or held in captivity).

	Deceased	Euthanasia	Released	Other
Cats/dogs (%)	71.1	4.7	21.6	3.1
Other causes (%)	34.7	4.2	52	9.1

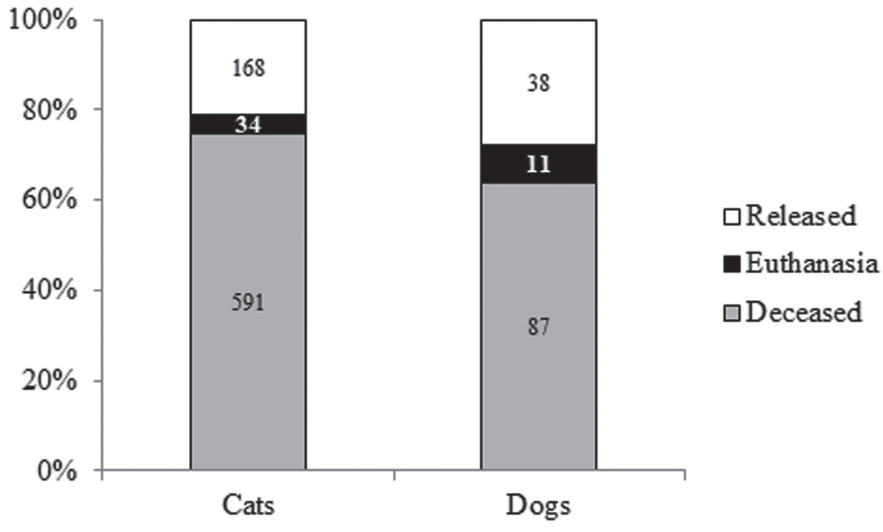

Figure 3. Outcomes of wild animals admitted to CRAS in Genoa following predation attempts by cats and dogs.

Moreover, two birds (the Spotted crake *Porzana porzana* and the Garden warbler *Sylvia borin*) belong to a critically endangered and an endangered species, respectively, 39 birds to vulnerable species and 18 birds and one bat belong to near threatened species according to the IUCN Italian Red List (Rondinini et al. 2022).

Discussion

Wildlife rescue centres, such as the CRAS in Genoa, provide an important service in their respective regions. Not only do they provide a means by which we can quantify the impact(s) people may have on wildlife populations through their activities and lifestyles, but they also constitute a permanent observatory for monitoring the impacts of the predatory behaviour of domesticated and feral animals on wild animal populations in the surrounding areas (Tribe and Brown 2000; Dessalvi et al. 2021). Natural history museums can also be a valuable source of information in this regard (Ferguson 2020).

Amongst the anthropogenic causes of wildlife mortality, the predation by domestic cats and dogs is increasingly becoming apparent (Loss et al. 2013, 2022; Turner 2022; Kaplan 2025). This analytical study emphasises the detrimental impact that cats and dogs have on populations of wild vertebrates in Liguria and southern Piedmont, particularly involving birds and mammals. The monthly phenology of hospitalisations generally reflected the reproductive cycles of the species involved, with a maximum peak for the birds in the month of May perhaps influenced by the migratory behaviour of many of them. Similarly, Kays and DeWan (2004) found that predation by domestic cats on birds was greatest in spring and summer. The incidence of predation by cats is significantly higher than dogs and they prey mainly on passerine birds and small mammals (including bats). In contrast, the predatory impact of dogs on wildlife mainly concerns medium and medium-large sized mammals, which has been widely confirmed in previous studies (Hughes and Macdonald 2013; Guedes et al. 2021). Conversely, Woods et al. (2003) found that, in Great Britain, cats preyed most frequently on mammals (69%), followed by birds (24%). This study, however, was conducted by submitting questionnaires to cat owners and, therefore, probably reflects, more accurately, the real distribution of prey amongst different taxonomic groups. In fact, Kays and DeWan (2004), using the same method in the USA, observed a preponderance of mammals amongst the prey of domestic cats (86.4%). Similar results were obtained in a study conducted by Baker et al. (2005) using questionnaires in the urban area of Bristol (UK). This latest work led to an estimate of 21 prey/cat/year. Several studies, however, have evidenced the importance of predation by domestic cats as a cause of bird mortality (Yuzyk 2024; Kaplan 2025; Philippe-Lesaffre and Bonnaud 2025) and Loyd et al. (2017), through a review of data collected in 82 North American wildlife rehabilitation centres, recorded a preponderance of birds amongst the victims of attacks by domestic cats. The latter authors also highlighted a very high mortality rate amongst wild animals injured by cats, as observed by those working at the CRAS in Genoa. Furthermore, in Italy, Mori et al. (2019) recorded the prevalent predation by cats of passerines and rodents, while Ancillotto et al. (2013) highlighted the predatory focus of cats for bats, which also occurred in this study.

A fact that should not be underestimated is the presence of species of a certain conservation interest amongst the vertebrates admitted to the CRAS following predation attempts by pets. These data must be contextualised with the fact that Liguria is characterised by a high level of biodiversity. This region shows a significant presence of species and habitats of conservation interest at a Community level (Arillo and Mariotti 2007; Mariotti 2009) with more than 29% of the regional surface area within Natura 2000 sites (www.regione.liguria.it/homepage-ambiente.html). Dogs and cats, if left unattended and free to roam, can have a significant impact on the populations of some wild animals and may undermine the effectiveness of existing species conservation measures associated with the IUCN Red List or the Community Directives for the protection of fauna. In Australia, for example, feral cats are mainly responsible for the extinction of 34 mammal (about 10% of the endemic mammal fauna) and nine bird species since the nation's colonisation by Europeans in 1788 (Woinarski et al. 2019). Doherty et al. (2017), then, concluded that domestic dogs have contributed to the extinction of 11 vertebrate species and are a threat to at least 188 threatened species worldwide. This makes the risk of impact of domestic cats and dogs on sites of particular naturalistic value and on protected species potentially high (see also Trouwborst and Somsen (2020); Lázaro et al. (2024); Weng et al. (2024)).

The impact of domestic dogs and cats on wildlife is not limited to predation, but also extends to the destruction of eggs and nests and, in some cases, the transmission of pathogens (Hughes and Macdonald 2013; Costanzi et al. 2021). In addition, Rebolo-Ifrán et al. (2021) highlighted that, in suburban areas, the risk of predation of birds by cats and dogs may increase as a result of birds being injured after having flown into clear glass window panes. Furthermore, it is likely that predation is underestimated in records of the number of injured/killed wild animals attacked (Kays and DeWan 2004; Piontek et al. 2020; Seymour et al. 2020) especially when one considers that vertebrates are not the only prey (Lepczyk et al. 2023). This figure suggests a gross under-reporting of the impact that cats and dogs have on wildlife populations, based only on rescue data. Moreover, considering the relatively small regional areas of Liguria and south Piedmont (approximately 2% of the national territory), the CRAS records further understate the real extent of predation by cats and dogs across Italy.

Measures aimed at preventing, or at least containing, this problem are becoming increasingly necessary. Amongst these, the one that appears most immediate and effective is the availability of an educational programme for cat and dog owners on how to manage their pets and increase owner awareness of the potential impact(s) their cats and/or dogs can have on wildlife (Woods et al. 2003; Burton and Doblar 2004; Loss et al. 2013, 2022; Doherty et al. 2017; Mori et al. 2019; Piontek et al. 2020; Trouwborst et al. 2020; Turner 2022; Zamora-Nasca and Lambertucci 2022; Packer et al. 2023; Lázaro et al. 2024; Natoli 2024; Weng et al. 2024). Therefore, an effective awareness campaign is desirable, particularly for use in schools that harness the experience gained by operators of rescue centres, thereby engendering a more inclusive love of animals that many owners of cats or dogs would have and want to demonstrate. Through social networks, the public can engage with those who operate in the wildlife rescue centres and treat the injured wildlife. These 'frontline experts' can further educate the public on how to identify wildlife species that are most at risk in the surrounding areas. Finally, the use of tools, such as artificial intelligence and machine learning, may greatly enhance the identification of wildlife species at risk, thus contributing to conservation efforts aimed at reducing the negative impacts of introduced predators (Philippe-Lesaffre et al. 2024; Philippe-Lesaffre and Bonnaud 2025).

Conclusions

Domestic and feral cats and dogs reduce the biodiversity and survival rate of wildlife populations in north-western Italy. Quantitative analyses of data collected by the Genoese CRAS and the Natural History Museum in Genoa indicate that cats and dogs have a detrimental impact on populations of wild vertebrates in Liguria and southern Piedmont. Attacks by domestic animals particularly affect birds and mammals and also involve species of international conservation concern. Furthermore, vertebrates victims of attacks by dogs and cats had a significantly higher mortality rate than those hospitalised for any other reason. Although our research significantly underestimates the extent of this phenomenon, it highlights the possibility of monitoring it over time and space thanks to data obtained from the archives of rescue centres and, to a lesser extent, from natural history museums.

At present in Italy, as in other countries, measures to contain the impact of domestic cats and dogs on wildlife populations are crucial and raising public awareness of the issue, particularly amongst pet owners, is an essential aspect of any future public education initiative.

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Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statement

No ethical statement was reported.

Use of AI

No use of AI was reported.

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Author contributions

All authors have contributed equally.

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Data availability

All of the data that support the findings of this study are available in the main text.

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Appendix 1

Table A1. Number of individuals hospitalized for each species. Species are listed according to their systematics following Loy et al. (2019), Baccetti et al. (2020), Sindaco and Razzetti (2021). Abbreviations - B-I Birds Directive (2009/147/EC) Annex I; H-IV = Habitat Directive (92/43/EEC) Annex IV; CR = critically endangered, DD = data deficient, LC = least concern, NA = not applicable, NT = near threatened, VU = vulnerable according to the IUCN Italian Red List (Rondinini et al. 2022).

Species	Protection	IUCN	By Cat		By Dog	
			Juvenile	Adult	Juvenile	Adult
Reptiles (Reptilia)						
Squamata						
Tarentola mauritanica (Linnaeus, 1758)		LC	1	2		
Lacerta bilineata Daudin, 1802	H-IV	LC		1		
Chalcides chalcides (Linnaeus, 1758)		LC		1		
Natrix helvetica (Lacépède, 1789)		LC		1		
Coronella austriaca Laurenti, 1768	H-IV	LC	1			
Hierophis viridiflavus (Lacépède, 1789)	H-IV	LC	1	1		1
Birds (Aves)						
Galliformes						
Coturnix coturnix (Linnaeus, 1758)		DD		6		1
Alectoris rufa (Linnaeus, 1758)		DD		2		
Phasianus colchicus Linnaeus, 1758		NA		1		
Anseriformes						
Anas platyrhynchos Linnaeus, 1758		LC	1			3
Columbiformes						
Columba palumbus Linnaeus, 1758		LC	4	2		
Streptopelia turtur (Linnaeus, 1758)		LC		1		
Streptopelia decaocto (Frivaldszky, 1838)		LC	66	74	3	2
Caprimulgiformes						
Caprimulgus europaeus (Linnaeus, 1758)	B-I	LC		3		
Apus pallidus (Shelley, 1870)		LC	1			
Apus apus (Linnaeus, 1758)		LC	14	7		1
Cuculiformes						
Cuculus canorus Linnaeus, 1758		NT	2			
Gruiformes						
Rallus acquaticus Linnaeus, 1758		LC		1		
Porzana porzana (Linnaeus, 1766)	B-I	CR		1		
Gallinula chloropus (Linnaeus, 1758)		LC	1			
Charadriiformes						
Larus michahellis J. F. Naumann, 1840		LC			1	
Strigiformes						
Athene noctua (Scopoli, 1769)		LC	4			
Otus scops (Linnaeus, 1758)		LC	5			
Strix aluco Linnaeus, 1758		LC	1		1	
Accipitriformes						
Accipiter nisus (Linnaeus, 1758)		LC	1	1		

Species	Protection	IUCN	By Cat		By Dog	
			Juvenile	Adult	Juvenile	Adult
Bucerotiformes						
Upupa epops Linnaeus, 1758		LC		10		
Piciformes						
Picus viridis Linnaeus, 1758		LC	4	8		
Dendrocopos major (Linnaeus, 1758)		LC		6		
Falconiformes						
Falco tinnunculus Linnaeus, 1758		LC	1			
Psittaciformes						
Psittacula krameri (Scopoli, 1769)			2	2		
Passeriformes						
Garrulus glandarius (Linnaeus, 1758)		LC	8	5	1	
Pica pica (Linnaeus, 1758)		LC	16	8	1	2
Corvus monedula Linnaeus, 1758		LC		1		
Corvus corone cornix Linnaeus, 1758		LC		1		1
Periparus ater (Linnaeus, 1758)		LC		2		
Cyanistes caeruleus (Linnaeus, 1758)		LC	4	5		
Parus major Linnaeus, 1758		LC	14	6		
Delichon urbicum (Linnaeus, 1758)		NT	3			
Hirundo rustica Linnaeus, 1758		NT	1	3		
Phylloscopus collybita (Vieillot, 1817)		LC		3		
Aegithalos caudatus (Linnaeus, 1758)		LC	1	1		
Sylvia atricapilla (Linnaeus, 1758)		LC	15	11		
Sylvia melanocephala (J. F. Gmelin, 1789)		LC	1			
Sylvia communis Latham, 1787		LC		1		
Leiothrix lutea (Scopoli, 1786)				4		
Sitta europaea Linnaeus, 1758		LC	1			
Troglodytes troglodytes (Linnaeus, 1758)		LC		1		
Sturnus vulgaris Linnaeus, 1758		LC	4	3		
Turdus philomelos C.L. Brehm, 1831		LC		11		
Turdus iliacus Linnaeus, 1758		NA		1		
Turdus merula Linnaeus, 1758		LC	124	65	6	1
Muscicapa striata (Pallas, 1764)		LC	1			
Erithacus rubecula (Linnaeus, 1758)		LC	4	20		
Luscinia megarhynchos C.L. Brehm, 1831		LC		1		
Phenicurus phoenicurus (Linnaeus, 1758)		LC	14	3		
Regulus regulus (Linnaeus, 1758)		LC		1		
Regulus ignicapillus Temminck, 1820)		LC				1
Prunella modularis (Linnaeus, 1758)		NT		1		
Passer italiae (Vieillot, 1817)		VU	22	12	1	
Anthus trivialis (Linnaeus, 1758)		LC		1		
Motacilla cinerea Tunstall, 1771		LC				2
Motacilla alba Linnaeus, 1758		LC	1	1		
Fringilla coelebs Linnaeus, 1758		LC		14		

Species	Protection	IUCN	By Cat		By Dog	
			Juvenile	Adult	Juvenile	Adult
Coccothraustes coccothraustes (Linnaeus, 1758)		LC		1		
Chloris chloris (Linnaeus, 1758)		VU	3			1
Loxia curvirostra Linnaeus, 1758		LC		1		
Carduelis carduelis (Linnaeus, 1758)		NT	2	3	1	
Serinus serinus (Linnaeus, 1766)		LC	1	1		
Emberiza cirlus Linnaeus, 1766		LC	1			
Mammals (Mammalia)						
Erinaceomorpha						
Erinaceus europaeus Linnaeus, 1758		LC	2		33	17
Soricomorpha						
Sorex sp.		LC*		1		
Suncus etruscus (Savi, 1822)		LC		2		
Talpa caeca Savi, 1822		DD		1		
Chiroptera						
Tadarida teniotis (Rafinesque, 1814)	H-IV	LC		3		
Hypsugo savii (Bonaparte, 1837)	H-IV	LC	9	10		
Myotis sp.	H-IV			1		
Pipistrellus kuhlii (Kuhl, 1817)	H-IV	LC	2	18	1	
Pipistrellus pipistrellus (Schreber, 1774)	H-IV	LC		11	1	
Plecotus auritus (Linnaeus, 1758)	H-IV	NT	1			
Carnivora						
Vulpes vulpes (Linnaeus, 1758)		LC			4	2
Meles meles (Linnaeus, 1758)		LC			1	
Mustela nivalis (Linnaeus, 1758)		LC	4	1		
Mustela putorius (Linnaeus, 1758)		LC			1	
Cetartiodactyla						
Capreolus capreolus (Linnaeus, 1758)		LC			18	20
Dama dama (Linnaeus, 1758)		NA			1	
Sus scrofa (Linnaeus, 1758)		LC			1	
Rodentia						
Microtus savii (de Sélys Longchamps, 1838)		LC	1			
Glis glis (Linnaeus, 1766)		LC	26	12	1	1
Muscardinus avellanarius (Linnaeus, 1758)		LC	3			
Rattus norvegicus (Berkenhout, 1769)		NA	8	1		
Sciurus vulgaris Linnaeus, 1758		LC	4	1	1	
Lagomorpha						
Lepus europaeus Pallas, 1778		LC	1		1	
Sylvilagus floridanus (J.A. Allen, 1890)		NA	13		8	1

*All the species of the Italian fauna are classified LC.

Appendix 2

Table A2. Vertebrates killed by cats housed in the Museum of Natural History in Genoa. In the first column the date of collection is shown, except for some specimens indicated with [M] for which only the date of arrival in the Museum is known. Abbreviations - B-I Birds Directive (2009/147/EC) Annex I; EN = endangered, LC = least concern, NA = not applicable, NT = near threatened according to the IUCN Italian Red List (Rondinini et al. 2022).

Date	Order	Species	Provenance	Red List – Protection
Reptiles (Reptilia)				
16.10.2012	Squamata	*Coronella girondica*	Genoa Quinto, Via F. Filzi	LC
Birds (Aves)				
08.04.1997	Piciformes	*Picus viridis*	Sori (Genoa province), via Sant'Apollinare	LC
21.03.1998	Passeriformes	*Luscinia svecica cyanecula*	Genoa Quinto, via Bettolo	NA
17.04.2002	Cuculiformes	*Cuculus canorus*	Lavagna (Genoa province), strada panoramica	NT
23.01.2007 [M]	Passeriformes	*Garrulus glandarius*	Genoa, via Ruffini	LC
10.05.2010	Passeriformes	*Sylvia atricapilla*	Genoa Apparizione, via Shelley	LC
01.11.2013	Passeriformes	*Leiothrix lutea*	Ferriere di Lumarzo (Genoa province), Fontanabuona Valley	
12.02.2014	Passeriformes	*Phylloscopus collybita*	Genoa, Piazza Manin	LC
11.2014	Passeriformes	*Troglodytes troglodytes*	Carasco (Genoa province), loc. Terrarossa	LC
09.2015	Passeriformes	*Sylvia borin*	Sestri Levante (Genoa province)	EN
12.04.2017 [M]	Psittaciformes	*Melopsittacus undulatus*	Genoa Quarto	
28.11.2017 [M]	Passeriformes	*Leiothrix lutea*	Alassio (Savona province)	
29.11.2017 [M]	Passeriformes	*Regulus regulus*	Lumarzo (Genoa province), loc. Costa da Cà	LC
30.03.2019	Passeriformes	*Prunella modularis*	Vado Ligure (Savona province), Porto Vado, via Madonnetta	NT
01.11.2019	Passeriformes	*Cyanistes caeruleus*	Stella (Savona province), Mezzano	LC
21.06.2022	Coraciiformes	*Coracias garrulus*	Genoa, Villa Croce	LC, B-I
Mammals (Mammalia)				
12.05.2011	Soricomorpha	Shrew	Genoa Multedo, Villa Gavotti	
19.06.2012 [M]	Rodentia	*Glis glis*	Cremeno (Genoa province)	LC
19.06.2012 [M]	Rodentia	*Glis glis*	Cremeno (Genoa province)	LC
19.06.2012 [M]	Rodentia	*Sciurus vulgaris*	Cremeno (Genoa province)	LC
19.06.2012	Rodentia	*Sciurus vulgaris*	Cremeno (Genoa province)	LC
27.08.2014	Rodentia	*Glis glis*	Finale Ligure (Savona province), Finalborgo, valle Aquila	LC
02.09.2014	Rodentia	*Glis glis*	Ceranesi (Genoa province), Livellato	LC
22.06.2016 [M]	Soricomorpha	Shrew	Genoa Quinto al Mare	
20.09.2016	Soricomorpha	Shrew	Genoa Quinto al Mare	
20.09.2016	Soricomorpha	Shrew	Genoa Quinto al Mare	
26.10.2018	Rodentia	*Glis glis*	Pezzolo, Uzzone Valley (Cuneo province)	LC
11.05.2019	Soricomorpha	Shrew	Rialto (Savona province)	
23.11.2019	Soricomorpha	Shrew	Genoa Quinto al Mare	