

The impact of domestic cat (*Felis
catus*) on wildlife welfare and
conservation: a literature review.

With a situation summary from Israel.

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“... he will kill mice and he will be kind to babies when he is in the house, as long as they don't pull his tail too hard. But when he has done that, and between times, he is the cat that walks by himself and all places are alike to him, and if you look out at nights you can see him waving his wild tail and walking by his wild lone- just the same as before”.

Rudyard Kipling

(1902)

Introduction

Domestic Cats (*Felis catus*) are found in commensal relationships with humans wherever those are present. Today, with the rapidly growing human population, which quickly occupies more and more remote areas on the planet, cats are found in all continents and in many oceanic islands, with very few environmental factors limiting their distribution. Wherever cats are present they have immense impact on wildlife by preying on small mammals, birds, reptiles and amphibians, threatening the genetic pool of wildcat species through hybridization and acting as reservoirs in the transmission of numerous disease, creating a health hazard effecting both wildlife and human populations.

Cats can be grouped into three categories according to where and how they live. The definitions and categories used in the published literature vary widely. I chose to use the following categories throughout this report (based on: Biodiversity group environment Australia, 1999):

Domestic pet cats – cats that are owned by an individual or a household. Their owners supply most of their needs.

Stray cats - cats found in and around cities, towns and rural properties. They may depend on some resources provided by humans, but are not owned.

Feral cats – cats that live and reproduce in the wild and survive by hunting or scavenging. Non of their needs are satisfied intentionally by people.

In reality, these categories of cats are a continuum and individuals may move freely from one category to the other. Recruitment to the stray and feral groups from the domestic population constantly occurs when cats wonder off from their home to join existing feral or stray populations or when irresponsible owners dump unwanted cats and kittens. However, it is important to remember that all of the above are the domestic species *Felis catus* and that stray and feral cats are simply an introduction of that domestic species to the urban, suburban and natural environment.

In this report I will use the term ‘domestic cat’ as a general term referring to *Felis catus*, and the relevant termination when referring to a specific category.

The origin of the domestic cat is the wildcat (*Felis silvestris*), which is distributed across most of the “old world”, from parts of North West Europe, through the Middle

East, parts of Asia and generally (excluding the true desert areas) throughout the African continent (Garman, 2000). It is commonly accepted that domestication was of the African subspecies *Felis silvestris libyca* (Bradshaw, 1992 in: Gunther and Terkel 2002).

Cats were first domesticated in Egypt around 2000BC (Serpell, 1988 in: Coleman et al., 1997), they were brought to Britain by 300AD by the Romans and European colonists were the ones to introduce them around the globe (Coleman et al.1997). The domestic cat is now considered by some scientists a separate species (Coleman et al.1997).

There were four types of introductions of domestic cat into the natural environment:

1. Introduction into the “old world” where the similar ancestral wildcat occurs.
2. Introduction into the “new world” where 12 native feline species occur.
3. Introduction into the Australian kingdom, in which there are no native placental predators, but marsupial predators such as the marsupial native cat (*Dasyurus viverrinus*) existed.
4. Introduction into New Zealand and into numerous oceanic islands, where there are no native predators.

The impact of the domestic cat as a predator in each of the environments will be discussed in this report.

How many cats are there?

Estimating cat's numbers is a difficult and often impossible mission. In most countries cat owners are not obligated to license or even vaccinate their pet cat, so there is no official data on the number of owned cats. Data is often obtained through food manufacturers sales data or through telephone surveys. The numbers of stray cats can sometimes be estimated from data obtained from cat eradication programs carried by municipalities. Numbers of feral cats can be roughly estimated from single sightings and sporadic studies that are carried in different habitats throughout the world. In all these cases cat numbers are usually underestimated but never the less disturbingly high.

In Britain, cats are the most abundant carnivores. In 1993 the Cat Protection League estimated that approximately 25 percent of British households owned at least one cat and that the British population of domestic cats was approximately 7.6 million. This population was predicted to rise to 8 million by 2000 (Cat Protection League 1993 in: Woods et al., in press). In addition, 813,000 cats are estimated to live in colonies in a feral or semi wild state in rural areas (Harris et al., 1995 in: Woods et al., in press). By now, there are about 9 million cats in Britain (Woods et al., in press).

The estimated numbers of pet cats in urban and rural regions of the United States have grown from 30 million in 1970 (Pet Food Institute, 1982 in: Coleman et al., 1997) to 60 million in 1990 (Nassar and Mosier, 1991 in: Coleman et al., 1997). These estimates are based on U.S. Census data and include only those cats that people claim to "own" as pets, not cats that are semi-wild or free ranging. According to Coleman et al. (1997) approximately 30% of households in the US have cats. In rural areas where free-ranging cats are usually not regarded as pets, approximately 60% of households have cats. In the state of Wisconsin alone, with approximately 550,000 rural households, the number of rural free-ranging cats (not house pets) may be as high as 2 million (Coleman and Temple, 1993 in: Coleman et al., 1997). The combined total of pets and free-ranging cats in the U.S. is probably more than 100 million.

In Canada, there are about 5 million pet cats (The Cat In Kennels Program). In 1995 over 4600 stray cats were impounded in Toronto and in 2000, 13,091 cats were impounded of which 50 percent were euthanized (Cat in Kennel Campaign). This data gives a rough idea about the number of stray cats in a large city like Toronto, the growth rate of a cat population and the efficiency of eradication programs.

Unfortunately, we don't know the number of the total cat population in Toronto, and what percentage of the stray cat population was removed.

In Australia there were 2.6 million pet cats, in 1.8 million houses households (26% of house holds in Australia) in 1998 (Petnet Statistics, 1998). A survey carried in 1993-1994 showed that 1,397,000 pet cats belonged to almost one million households (985,000) in the capital metropolitan cities (The Metropolitan Domestic Cat, 1994).

In New Zealand, 47% (Auckland Museum, 2001) of the 1.3 million households (Statistics New Zealand Te Tari Tatau, 2003) have cats.

Domestic cats as predators

Cats were predominantly domesticated in order to control pests such as mice, rats and snakes. Only relatively recently have they been bred solely for their beauty. During the process of domestication there was little selective pressure on the ancestral form, and thus there are relatively few morphological and behavioral changes in the domesticated cat today (Bradshaw, 1992 in: Gunther and Terkel 2002).

Like their wild ancestors, domestic cats are very well adapted to the killing of small mammals and birds. They may travel several kilometers at night in search of prey. They have excellent eyesight, hearing and sense of smell and can find their prey by following the scent trail (Parks & Wildlife, 2002). They are also very good climbers. Equipped with four sets of retractable claws, and teeth adapted for gripping, tearing and shearing, cats are formidable hunters (Parks & Wildlife, 2002).

Where documented, domestic cat's impact on wildlife populations appears enormous. Feral and rural, free ranging cats have greater access to wild animals and thus demand the greatest toll but even urban domestic pet cats take live prey when allowed outside. Unlike some predators, a cat's desire to hunt is not suppressed by adequate supplemental food. Even when fed regularly by people, a cat's motivation to hunt remains strong, so it continues hunting (Adamec, 1976 in: Coleman et al. 1997).

Liberg (1984) notes that in times with easy access to natural prey, domestic house cats in southern Sweden seemed to prefer that to household food.

Domestic cats differ from other wild predators in four ways

1. People protect cats from disease, predation and competition, factors that would otherwise control numbers of wild predators (Coleman et al., 1997).
2. Cats often have a dependable food supply and their numbers are therefore not influenced by changes in prey population (Coleman et al., 1997).
3. Unlike many other predators, cats' densities are either poorly limited or not limited at all by territoriality (Coleman et al., 1997).
4. Unlike other mainly nocturnal predators the domestic cat is also active by day, mainly during the early morning and dusk (Miramovich 1991:

in Gunther and Terkel 2002), this allows cat extra scavenging and hunting time relative to other predators.

Cats' predatory behavior appears primarily opportunistic (Barrette, 1997b), they are considered to be generalist hunters (Andersson and Erlinge, 1977), who exploit a wide range of food items (Andersson and Erlinge, 1977). They show seasonal variation in predation on different prey species, which appears to reflect shifts in prey availability (Barrette, 1997b; Liberg, 1984).

Free ranging household cats can also be described as migrating predators- switching from domestic subsistence to predation at certain times (Andersson and Erlinge, 1977). In Southern Sweden feral cats and house cats shared almost identical prey items but during periods with generally low prey abundance or availability, house cats relied more heavily on household food (Liberg, 1984).

Although cats respond to changes in prey availability they still have a tremendous impact on their prey populations. Natural predators are usually unable to keep up with the numbers of their prey population (Andersson and Erlinge, 1977), but domestic pet cats and stray cats are different because they are not regulated by the availability of wild prey and their populations are stable regardless of prey availability. The continued pressure of their predation can be analogous to the process of Hyperpredation on oceanic islands (Courchamp et al., 1999).

The great density of domestic cats has great impact on the ancestral wildcat and on other carnivores that maintain territories. In some parts of rural Wisconsin, densities of free ranging cats reach 114 cats per square mile (2.56km²). In these areas, cats are several times more abundant than all mid-sized native predators (such as foxes, raccoons (*Procyon lotor*), skunks (*Mephitis mephitis*)) combined. With abundant food, densities can reach over 9 per acre (1 acre= 4047m²), and cats often form large feeding and breeding "colonies" (81 cats were recorded in one colony, and colonies of over 20 are not uncommon) (Coleman and Temple, 1993; Natoli and de Vito, 1988). Crook and Soule (1999) showed that in coastal southern California approximately 35 hunting outdoor cats surround a moderately sized fragment of urban habitat adjacent to a canyon, where native wildlife existed. Such a canyon would only harbor one or two pairs of native predators such as coyotes or grey fox. The ancestral European wildcat, is solitary, territorial, and its densities vary, ranging from one cat per 0.7-

10km² (Macdonald and Barrett, 1993). Domestic cats, which move into rural and wild areas compete with the wildcat for food and territory (Mendelssohn and Yom-Tov, 1987) and greatly endanger the latter's declining populations.

Domestic Cats Impact on Wildlife and Their Choice of Prey

Studies of domestic cats' impact as predators and their choice of prey are available from numerous habitats around the world. The prey choice of domestic cats is similar to that of their wild ancestor, the wild cat. The African wildcat subspecies (*Felis silvestris lybica*) preys mostly on mice (*Mus spp.*), rats (*Ratus spp.*), and gerbils (*Gerbillus*), as well as scrub hare (*Lepus saxatilis*), rock rabbits (*Pronolagus spp.*), insects, birds and small reptiles (Garman, 2000). The European subspecies (*Felis silvestris silvestris*) eats mostly small rodents such as wood mouse (*Apodemus Sylvaticus*), pine vole (*Microtus pinetorum*), water vole (*Arvicola terrestris*) and shrew (*Soricidae*) while the Scottish subspecies (*Felis silvestris grampia*) bases its diet on species that are more abandoned in open terrain such as rabbits (*Oryctolagus cuniculus*) and hare (*Lepus europaeus*). Birds, small mammals and reptiles are also a part of the European cat's diet (Garman, 2000).

Childs (1986, in: Hall et al., 2000) reported that urban cats avoid foraging on large rats. Biben (1979, in: Hall et al., 2000) found that prey size and difficulty of capture may greatly influence the predation attempts by cats. This is supported by the findings of Read and Bowen (2001) that in arid southern Australia feral cats weighing less than 2.5 Kg typically preyed more on native vertebrates, that are presumably easier prey, than did larger cats, which preferred introduced species, mainly rabbits.

Most studies focus on domestic pet cats in urban and rural environment. Information about truly feral cats is scarce and sporadic, probably because they are harder to study. We can easily assume that feral cats, which subsists almost completely on natural prey take more live prey items than stray or domestic pet cats who are fed by human or subsist on human waste. Liberg (1984) found that the prey choice of house-based cats was similar to that of feral cats, but the absolute intake of the later was four times that of an average house based cat. Short et al. (2002) found that rodents, birds and reptiles occurred more frequently in the diet of feral cats and food scraps occurred more frequently in the diet of semi-feral cats, although, their dietary diversity was similar.

Domestic Cats' Predation in the Old World and in the New World

Prey species in the old and in the new world evolved in the presence of felids.

We discuss the impact of domestic cat predation on those species, in the old world where the closely related wildcat occurs as well as other feline species, and in the new world where feline species different from those of the old world occur.

To find out more about the killing habits of cats in Britain, Woods et al. (in press) carried out a survey of almost a thousand cats during the spring and summer of 1997 for the Mammal Society. The respondents were everyday cat owners recruited through a big media drive by BBC Wildlife magazine and followed up with a range of newspaper and magazine articles and radio interviews. Each participating cat owner completed a form with details of their cat including its name, color, age, sex and the amount of food it was given and was asked to document what species the cat killed and brought home between 1st of April and 31st of August. This initial survey was followed up by a questionnaire to the respondents asking for more details about their cat, where it lived and its general environment. The questions included whether or not the owners fed birds and mammals in their garden, whether or not the cat was kept indoors at night and if it wore a bell. Woods et al. (in press) received kill or capture records of 986 cats amounting to a total of 14,370 prey items. The results analysis of the 5-month study indicates that some cats bring more than 37 prey items each year. The total of animals killed and brought home by 9 million cats living in Britain is estimated in the region of 275 million per annum. Although this number is striking it only amounts to the average cat bringing about one prey item every two weeks. However these approximations are probably underestimates, because cats will not bring home all the prey they kill. George (1974) suggested that three farm cats brought home 50% of the prey they captured. Moreover, the survey did not investigate the killing behavior of truly feral cats, which depend on predation for survival.

Woods et al. (in press) survey showed that mammals made up 68.6% of the prey items, birds 23.6%, amphibians 4.1%, reptiles 0.9%, fish 0.2%, invertebrates 1.2% and the rest were unidentified. Different studies from around the world showed similar ratio of prey choice, however, the diet of free ranging cats reflects the locally available food (Coleman et al., 1997).

Predation by domestic cats may threaten even very common species such as house sparrows (*Passer domesticus*): In Bedfordshire village of Felmersham in England, house sparrows made up 17% of the total intake of domestic pet cats (Churcher and Lawton, 1987). In the British Mammal Society survey 961 out of the 3391 birds collected were house sparrows (28.3% of avian intake or 6.6% of total intake). Mead (2000 in: Woods et al., in press) suggests that every year, during the breeding season from April to August cats are responsible for the death of 9 million house sparrows in Britain. This predation pressure is significant since there were 2.6-4.6 million pairs of house sparrows in Britain during 1988-1991 (Gibbons et al., 1993 in: Woods et al., in press). Hence, cat predation alone could account for most or all of the annual productivity (Woods et al., in press).

In North America, where the ancestral wildcat does not exist and the domestic cat was only introduced during the European colonial times cats also destroy an astonishingly high number of animals annually. Some of these kills are house mice, rats and other species considered pest, but many are native songbirds and mammals whose populations are already stressed by other factors such as habitat destruction and pesticide pollution.

In Canada, 5 million pet cats kill approximately 140 million birds and small animals each year (The Cat in Kennel Campaign).

Based on studies from across the US, it is estimated that in the US cats kill over a billion small mammals and millions of birds each year (Coleman et al., 1997).

In Virginia, researchers compared free roaming domestic pet cats in a rural setting and a more urban one. Between January and November of 1990 cats caught, on average, 26 native individual prey species in the urban area, and 83 in the rural area (Mitchell and Beck, 1992).

In California, a two-year study (Hawkins, 1998) was conducted in two parks with grassland habitat in the East Bay Regional Park District. One park had no cats, and in the other park there were more than 20 cats that were fed daily. There were almost twice as many birds seen in the park with no cats than in the park with cats. California thrashers (*Toxostoma redivivum*) and California quail (*Callipepla californica*), common ground nesting birds were seen during surveys in the no-cat area while they were never seen in the cat area. In addition, over 85 percent of the native deer mice

(*Peromyscus maniculatus*) and harvest mice (*Reithrodontomys megalotis*) trapped were in the no cat area, whereas 79 percent of the house mice (*Mus musculus*), which is an exotic species to California and considered as pest, were found in the cat area. According to Hawkins (1998) “cats at artificially high densities, sustained by supplemental feeding, reduce abundance of native rodent and bird populations, change the rodent species composition, and may facilitate the expansion of the house mouse into new areas...” (Hawkins, 1998).

Crook and Soule (1999) showed the impact of cat predation on native prey species in a fragmented habitat in coastal southern California. Intensive urbanization has destroyed most of the native sage-scrub habitat, leaving undeveloped steep-sided canyons as isolated fragments of habitat islands in an urban sea (Crook and Soule, 1999). 32% of residents bordering the San Diego fragment owned cats, and on average each cat owner owned 1.7 cats. 77% of cat owners let their cats outdoors and 84% of outdoor cats brought back kills to the residence. Thus, approximately 35 hunting outdoor cats surround a moderately sized fragment (bordered by ~100 residents). In comparison, the canyons often harbor only one or two pairs of native predators such as coyotes (*Canis latrans*) or grey fox (*Urocyon cinereoargenteus*). Cat owners reported that each outdoor cat that hunted returned on average 24 rodents, 15 birds and 17 lizards to the residence each year. Crooks and Soule (1999) estimated that cats surrounding a moderately sized fragment return about 840 rodents, 525 birds and 595 lizards to residences per year. These approximations are probably underestimates, because, as mentioned above, cats do not bring home every prey item they kill. Identification of 68 prey items returned by cats indicated that 67% of 26 rodents, 95% of 21 birds and 100% of 11 lizards were native species. According to Crooks and Soule (1999) this level of bird predation appears to be unsustainable. Existing population sizes of some birds do not exceed 10 individuals, in small to moderately sized fragments, so even modest increases in predation pressure in conjunction with other fragmentation effects, may quickly drive native prey species to extinction.

A study of the habitat use and diet of feral cats in a Mediterranean habitat in a riparian reserve in central California (Hall et al., 2000) can probably reflect on the situation in other areas with similar climatic areas such as Israel. Cats in the reserve seemed to strongly prefer staying in riparian habitat. Hall et al. (2000) suggests that this habitat

provides ample cover and perhaps a variety of prey, especially birds. Cats in the study foraged mostly in the adjacent fields and annual grasslands and to a lesser extent in the riparian habitat. The feral cats in the study area fed mostly on small mammals and preferred native species rather than introduced ones.

Hall et al. (2000) suggests that the threats from feral cats by predation to native prey animals and by competition to native predators are increasing in fragmented habitats, which characterizes Mediterranean systems where greater “edge” makes access to native species even easier for feral cats.

Domestic Cats’ predation in Australia and New Zealand

Australia’s native plants and animals adapted to life on an isolated continent over millions of years. Marsupial predators were present throughout the continent, but no native placental predators existed until the introduction of the dingo (*Canis lupus familiaris dingo*) about 4000 year ago (Australian Conservation Foundation, 1984). The introduction of the dingo was only the beginning of an ecological disaster for many unique, native Australian species. Since the European settlement, in the first quarter of the 19th century, Australian native species had to compete for food, shelter and habitat with a range of introduced animals. They have also had to face new predators, one of which was the domestic cat. The type, scale, frequency and intensity of disturbance to the native Australian fauna and flora, has changed presenting a significant adaptive challenge to native animals over a compressed time scale (Wilson and Friend, 1999). With the arrival of European settlers, cats diffused inland and were spread from multiple coastal introductions in the period 1824-86 (Abbott, 2002). By the 1850’s colonies of feral cats were established in the wild (Biodiversity Group Environment Australia, 1999). Considerable numbers of cats were deliberately released in semi-arid and arid regions in the 1880’s as part of a misguided rabbit control program (Read and Bowen, 2001) and by 1890 nearly all the continent had been colonized by cats (Abbott, 2002). The rapid dispersal of cats throughout Australia was helped by the fact that they have few natural predators or fatal diseases in the continent.

In Australia, Feral cats hunt and kill numerous native birds, mammals, reptiles, amphibians and insects and this threatens the survival of many endangered and

vulnerable species. Read and Bowen (2001) estimate that in the Roxby Downs Region in South Australia annual cat predation accounts for approximately 700 reptiles, 150 birds and 50 native mammals per square kilometer. There are instances where feral cats have directly threatened the successful recovery of endangered species. For example, feral cats killed many of the captive bred Malas (Rufous Hare-wallabies - *Lagorchestes hirsutus*) that were released in the Tanami Desert in the Northern Territory during 1990 and 1991 (Biodiversity group environment Australia, 1999). Australian mammals may be such easy prey for domestic cats that a single feral cat was responsible for reducing the numbers of rock wallabies (*Petrogale spp.*) in an isolated colony in tropical Queensland (Biodiversity Group Environment Australia, 1999).

Barratt (1997b) found that 64% of the prey items brought homes by cats in Canberra, Australia, over 12 month, were introduced mammals, especially mice and rats. Birds comprised 27% of prey (14 % native, 10% introduced and 3% unidentified). Reptiles made 7% of the prey items, amphibians 1% and native mammals 1%. While this suggests that introduced mice and rats are common prey of house cats in urban and suburban environments in Australia, it also suggests that in relatively undisturbed environments adjoining new residential development, predation by house cats may have a substantial impact on locally abundant, patchily distributed populations of native fauna, particularly mammals (Barratt, 1997b). Introduced bird species such as, common starlings (*Sturnus vulgaris*), blackbirds (*Turdus merula*) and the common mynah (*Acridotheres tristis*), appear to displace native species such as the red-rumped parrot, (*Psephotus haematonotus*), galahs (*Eolophus roseicapillus*), and eastern (*Platycercus eximinius*) and crimson (*Platycercus elegans*) rosellas from their nest holes. If house cats were able to control populations of introduced species, less aggressive native species may ultimately benefit. However, the stable or increasing trends in the abundance of these species in Canberra suggests that house cats are not having a major impact on these species (Barratt, 1998).

Studies have shown that cats in arid Western and Southern Australia prey heavily on rabbits (Short et al., 2002; Read and Bowen, 2001). The presence of rabbits can allow an increased predator population, which can lead to extinction of the indigenous, and less well adapted prey species (Courchamp et al., 1999). Declines in rabbit population were not followed by significant declines in cat population (Read and Bowen, 2001),

presumably because they could effectively switch to hunting a wide range of native vertebrates. Native rodents, birds and reptiles, occurred frequently in the diet of feral cats in Western Australia (Short et al., 2002). The results of a cat removal experiment supported the hypotheses that predation by feral cats reduced population sizes of small, native vertebrates (Risbey et al., 2002). The conilurine rodents, a predominantly Australian group of almost 50 species, have suffered a higher rate of extinction and decline than other mammalian taxa (Smith and Quin, 1996). The abundance of the cat was the best predictor of decline in small conilurines (<35g). Declines have been most severe in areas where predator abundance has been greatly elevated and sustained by the introduction of rabbits and mice taxa (Smith and Quin, 1996).

Feral cats have impacted heavily on island fauna. The fauna and flora on the islands of the New Zealand archipelago evolved in the absence of terrestrial mammals and did not develop the necessary defense mechanisms against predators. As a result, New Zealand fauna and flora has proved particularly susceptible to their recent introduction. Because islands are small and isolated the presence and impact of feral cats is more obvious than on the mainland. The avifauna of New Zealand has suffered many extinctions and declines, and now contains a disproportionately high number of threatened species. Over 40 percent of the land-bird species present before human occupation are now extinct (Dowding and Murphy, 2001). Overall, rats, cats and mustelids appear to be the introduced mammals that have the greatest impacts on New Zealand's shorebirds (Dowding and Murphy, 2001). Dowding and Murphy (2001), based on analysis by King (1985), suggest that the greatest numbers of extinctions of island birds worldwide due to predators, have been caused by rats (54%) and cats (26%). There are many examples of species that are known or believed to be endangered or threatened primarily by cats. The Stephens Island wren (*Xenicus lyalli*) was both discovered and exterminated by the lighthouse keeper's cat in 1894 (Buller, 1905). On Little Barrier Islands, feral cats contributed to the total extinction of the Little Barrier snipe (*Coenocorypha a. barrierensis*), the local extinction of North Island saddleback (*Philesturnus carunculatus rufusater*), and the severe reduction in numbers of grey-faced petrel (*Pterodroma macroptera*), Cook's petrel (*Pterodroma cookii*) and black petrel (*Procellaria parkinsoni*), plus the decline of lizard and tuatara species (Veitch, 2001). The adult population of Parea or the Chatham Island pigeon

(*Hemiphaga novaeseelandiae novaeseelandiae*), an endangered subspecies, endemic to the Chatham Island of New Zealand, were increased three fold from 27 in 1990 to 81 in 1994 in valleys where feral cats and brush tailed possums (*Trichosurus vulpecula*) were reduced (Grant et al., 1997). On Stewart Islands of New Zealand, most of the Kakapo (*Strigops habroptilus*) found dead had been killed or scavenged by feral cats (Powlesland et al., 1995). The major reason for decline of the dotterel (*Charadrius morinellus*) on Stewart Islands is attributed to predation by feral cats (Dowding and Murphy, 1993). The mainland New Zealand population of the New Zealand shore plover (*Thinornis novaeseelandiae*) declined over the past century, probably as a result of predation by introduced rats and feral cats (Davis, 1994).

In Australia and New Zealand there is considerable awareness of the threats posed to native fauna by introduced animals, including cats. In New Zealand there are many programs attempting translocation of native species on islands refuges free of introduced predators. Research is currently under way on the development of species-specific toxins and lures, so that poisoning can be more targeted (Dowding and Murphy, 2001). In Australia, the Commonwealth Government has a program with the specific aim of reducing the impact of feral animals, The National Feral Animal Control Program (NFACP). It is a Natural Heritage Trust funded program managed by Environment Australia and the Bureau of Rural Sciences. The program aims to develop and implement projects to reduce the impact of feral animal pest on native species and the natural environment, particularly in areas important for the recovery of threatened species (Environment Australia, 2001)

In 1992 the Australian Parliament passed the Endangered Species Protection act 1992. This act lists predation by foxes (*Vulpus vulpus*) and feral cats, competition and land degradation by feral goats (*Capra hircus*) and rabbits as key threatening processes of native species. The Act also provides statutory obligations on the commonwealth, in cooperation with the states and territories, to prepare and implement a joint Threat Abatement Plan (TAP) for each listed threatening process. The NFACP, has funded the development of four Threat Abatement plans (one of which is for feral cats). Some of the key objectives of the TAP for predation by feral cats are:

Eradicate feral cats from islands where they are a threat to endangered or vulnerable native animals.

Prevent feral cats from occupying new islands in Australia where they may threaten species or ecological communities with extinction.

Promote the recovery of species and ecological communities that are endangered or vulnerable as a result of predation by feral cats.

Improve the effectiveness and humanness of cat control methods

Improve the knowledge and understanding of the impacts of feral cats on endangered or vulnerable native animals and the interactions of feral cats with other pest species.

Currently, research is being undertaken by the TAP to improve the effectiveness of baits and traps in controlling feral cats. The use of visual lures (such as feathers and cotton wool) and attractants (such as tuna oil) are being tested in an effort to attract greater numbers of feral cats to traps and baits. The impact of feral cats on native wildlife is being studied in various parts of Australia in order to have it quantified. It is important to determine and understand the extent of the impact on native animals so that control measures can be more effectively implemented or better ones developed (Biodiversity Group Environment Australia, 1999).

More Factors that Influence Predation by Domestic Cats.

A large-scale survey of 5,500 homes with bird feeders was carried in the US during the winter of 1989-1990 in order to assess the effect of domestic pet cat predation on birds near bird feeders (Dunn and Tessaglia, 1994) the results indicate that the domestic cat was a significant predator of birds at feeders, but that predation rates in gardens where birds were fed were similar to predation rates in other areas. Species killed by cats at feeders included: dark eyed junco (*Junco hyemalis*), pine siskin (*Carduelis pinus*), northern cardinal (*Cardinalis cardinalis*) and American gold finch (*Carduelis tristis*). The results of the British Mammal Society survey (Woods et al., in press) suggest that cats living in houses that provided food for birds actually killed fewer birds than those living in houses that did not provide food. Feeding of birds may reduce susceptibility in a few ways: a greater number of birds may enhance group vigilance behavior and thus warn against predators (Siegfried and Underhill, 1975; Waite, 1987; Popp, 1988 in: Woods et al., in press). Alternatively, extra food supply may reduce the foraging time and thus the time during which the birds are at risk of being captured by cats (Jansson et al., 1981 in: Woods et al., in press), or birds

that habitually used human-provided food tend to be more alert to the dangers posed by cats (Woods et al., in press).

The efficiency of fitting cats with bells is contentious. Barrette (1998), found that bellling of cats has no significant effect on the amount of prey caught. The results of Ruxton et al. (2002) on the other hand suggest that equipping cats with bells reduced prey delivery rates by about 50%. During an eight-week study each cat delivered an average of 5.5 prey animals in the four weeks with the bell off and 2.9 items in the four weeks with the bells on (Ruxton et al., 2002)). The result of the longer study by Woods et al. (in press) show that fewer mammals were killed and brought home by cats that were equipped with bells. Birds capture rates were not affected by equipping cats with bells.

Bells may serve as a warning of a predator's approach. Birds may rely largely on visual cues in predator avoidance behavior or they may not hear the bell due to its acoustic qualities (Woods et al., in press). Coleman et al. (1997) suggests that wild animals don't necessarily associate the ringing of the bell with danger and that some cats with bells on their collars learn to stalk their prey silently.

Cats that were kept in at night brought home fewer mammals than ones that were allowed to stay outside (Woods et al, in press; Barrette, 1998). Movement of domestic pet cats from residential environment into surrounding habitat was shown to be significantly larger at night than during the day (Barrette, 1997a) making populations of nocturnal species and particularly small mammals, which are predominantly nocturnal, exposed to predation by domestic cats.

Indirect impact of predation by domestic cats.

Predation has direct effect on prey survival but may also have indirect effects.

Domestic cats may compete with native predators for prey animals. Unlike many other predators, domestic cats do not strictly protect or defend their territories and therefore live in much higher densities in colonies that can grow to include dozens of animals (Coleman et al., 1997). Additionally, cats are often fed by human caretakers, and vaccinated against disease, as a result they are stronger, and may be superior in competition with other wild predators. In fact, George (1974) argued that the most

detrimental effect of cats on indigenous wildlife might be as competitors to native predators, especially rodent dependent raptors.

Another indirect effect of predation is that animals may change their foraging behavior under predation risk (Lima and Dill, 1990 in: Korpimaki and Kerbs, 1996) or there may be behavioral changes that will reduce reproduction of prey population (Korpimaki and Kerbs, 1996). In addition, behavioral changes in prey animals may decrease the chances of mortality from one predator but make them more vulnerable to a second one (Chernov et al., 1976 in: Korpimaki and Kerbs 1996).

Hybridization between Domestic Cats and Wildcat.

Hybridization between domestic and wild cats is by far the greatest threat to the existence of wildcats subspecies all over their range of distribution (Garman, 2000). Wildcats subspecies can be split into three main groups: the Silvestris Group (European wildcat), the Lybica Group (African wildcat) and the Ornata Group (Asian wildcat). The last is considered to be most at risk (Garman, 2000).

As human population increases, people are moving into more remote areas, coming closer to the last refuges of endangered species. Today most subspecies of wildcat live in relative close proximity to human habitation and in as much close to domestic and feral cat populations. In these areas wild cats often mate with domestic cats to create fertile hybrids. Over an extended period of time it is possible that certain subspecies will interbreed themselves to extinction (Garman, 2000). Domestic cat males are bigger than wildcat males and easily compete with them for females in estrous (Mendelsohn and Yom-Tov, 1987).

Recent research shows that in all the Scottish wildcat (*Felis silvestris grampia*) and feral cat populations as few as one in eight are pure bred wildcat with the remaining hybrids ranging in between (Garman, 2000). In the light of this, *F. silvestris grampia* has been listed as endangered by the IUCN.

In Israel there is a severe danger to the existence of pure wildcat, *Felis silvestris tristrami*, because of hybridization with domestic cats (Mendelsohn and Yom-Tov, 1987).

Wildlife Welfare and Public Health

Domestic cats serve as a reservoir for numerous wildlife and human diseases, including cat scratch fever, distemper, histoplasmosis, leptospirosis, mumps, plague, rabies, ringworm, salmonellosis, toxoplasmosis, tularemia, and various endo- and ecto parasites (Fitzwater, 1994). These diseases may be transferred to wildlife species that come to contact with feral, stray and domestic pet cats, threatening vulnerable populations. Reversibly, domestic pet cats may acquire numerous diseases from wildlife and transmit them to their human owners.

Although this report deals with the impact of domestic cats on wildlife populations, their effects on human population cannot be ignored altogether and will be discussed in this section.

Domestic cats and wildlife disease

Few feline species are contenders for extinction due to diseases transmitted by domestic cats. For example, the Mountain lion (*Felis concolor*) has been infected with feline leukemia, spread by domestic cats (Jessup et al., 1993). The Florida panther (*Felis concolor coryi*), a subspecies of the mountain lion now reduced to about 50 animals (Pain, 1997) may have been infected with feline panleukopenia (feline distemper) (Roelke et al., 1993), an immune deficiency disease, which may pose a serious threat to this rare species (Coleman et al., 1994).

Feline distemper is also one of the main threats to wildcats (*Felis silvestris tristrami*) in Israel (Mendelsohn, 1989). Wildcats have no resistance to the disease whatsoever and captive wildcats always succumb from it if not vaccinated. Domestic cats acquire resistance from the disease at an early age (Mendelsohn, 1989).

The more contact there is between domestic animals and wild ones, the greater the risk of new infections reaching rare species. As populations of domestic cats become larger, they form reservoirs for pathogens, where infection was once sporadic, it becomes a persistent presence, circulating continuously and flaring up when conditions are right. While wild animals can be susceptible to the same pathogens as domestic animals, they usually live at such low densities that they cannot keep the disease going indefinitely. After an outbreak, the pathogen disappears, and reinfection must come from outside (Pain, 1997).

Public health and general nuisance

Cats are carriers of many diseases that may be transmitted to human.

In the US, the majority of rabid domestic animals are cats (Krebs et al. 1997).

According to the Centers for Disease Control and Prevention in the US in 1996, 266 of the 574 cases of rabies detected in domestic animals were detected in cats (Krebs et al., 1997). During 2000, 249 of the 509 cases were detected in cats (Krebs et al. 2001).

In 1990, an 18-year-old man died in Germany from a severe case of generalized infection that caused immunosuppression. Orthopox virus (OPV) had been the cause of the infection and analysis evidence showed that it had been acquired from a stray cat (Czerny et al., 1997).

Cats are also reservoirs in the transmission of *Helicobacter heilmannii*, which causes gastritis in humans (Meining et al. 1998). Cats are healthy carriers of *Bartonella Henselae*, a bacterial agent that causes Cat-scratch disease. Cat-to-cat transmission of the organism is carried by the cat flea and does not require direct contact (Chomel, 2000). Young kittens are potential transmitters of human-pathogenic *Campylobacter spp.*, including *C. upsaliensis* (Hald and Madsen, 1997). The risk of developing Toxoplasmosis, which is a risk factor for habitual abortion among pregnant woman, is three times greater among women who have cats at home than among women who don't (Al- Hamdan and Mahdi, 1997). Cats are often infested with round worms and tape worms which can be transmitted to human, especially to children, and cause various gastric diseases (Shoonra, 2000). In an article in Haaretz daily, Ben-David (2003) expresses his concern, as a parent, of the fact that sandboxes in children's playgrounds in Tel Aviv are contaminated with cats' feces. Ironically, Shoonra, the Israeli cat site (2000) recommends that **children** will not be allowed to play in open sandboxes where dogs and cats may defecate.

Populations of stray cats flourish around open dumpsters and open refuge concentrations in and around human dwelling. Furthermore people feed stray cats in and around communal and public buildings. In addition to the public health hazard, there is also the disagreeable smell of cat's urine, the commotion of females in estrous and the annoyance caused by stray cats that enter ground flats and houses in search of food.

Most stray cats in city are in a terrible state, they often lead a short, miserable life, exposed to car hits, animal attacks, human cruelty, disease, parasites, poisons and traps. Longevity of stray cats is estimated at 4-5 years while domestic cats can live 15-17 years as house pets (Ogan and Jurek 1997). Management actions to control stray cats numbers should be taken for the benefit of both the public and the cats.

Social and Spatial Organization of Domestic Cats

In order to deal with damages to wildlife concerning stray and feral cats, to decide whether the animals are pests and to decide upon methods of control, it is important to learn about their population ecology and habitat usage. In the late 1970's researchers found evidence that cats have the ability to exist in social groups (Dards, 1983) in contrast with the common belief that cats are strictly solitary animals. The degree of sociability depends on the quality of the habitat and on population density (Dards, 1983). A four-year study between October 1975 and July 1979 on stray cats took place in Portsmouth naval dockyard. This is an enclosed site with an area of less than 1000m² supporting a population of about 300 cats. The dockyard is essentially an urban habitat (Dards 1980) and the long-term study provides a good idea about the spatial organization of urban cats. Food in the dockyard was plentiful, and the cats depended on food provided by the people working and living in the dockyard and foraged in dumpsters and bins. Other than the food presented due to human activities the entire non-human fauna was potential food for cats. Cats were seen stalking, pouncing and eating insects. Dead birds and piles of feathers were found relatively frequently in the dockyard (feral pigeon (*Columba livia*), blackbirds, sparrows, black headed gull (*Larus ridibundus*) and common starling). Mice and rats were rarely seen as victims of cat predation although the pest rodent population in the dockyard was reported to be relatively high (Dards, 1980). This may support the observation that prey size and difficulty of capture may greatly influence the predation attempts by cats and that urban cats avoid foraging on large rats (reviewed in: Hall et al., 2000). It also implies that cats have a small contribution to the control of pest rodent populations in cities and rural areas.

Home ranges of cats in the dockyard averaged 84m² for males and 8m² for females, but there was considerable variation in range size between mature males. Extremes of 8 m² and 240 m² were recorded for males with relatively even distribution between

these extremes (Dards, 1983). The home ranges of the cats are strongly influenced by the favorable environment. The more favorable the environment, the greater the density of animals and the smaller the home range (Dards, 1983; Gunther and Terkel, 2002; Miramovich, 1995). There is also great overlap between male territories. The density of adult cats in the dockyard averaged two per 10m² (Dards, 1978). Haspel and Calhoun (1989) found that the home range of free ranging cats in Brooklyn, NY is stable and averages 26 m² for males and 17m² for females. Since the availability of food in this area is not a limiting factor, they concluded that home range size is a factor of body weight. Densities of urban cats are much higher than densities of cats found in rural areas. Home ranges of adult cats in a riparian reserve in central California averaged 317m² and did not differ significantly by sex (Hall et al., 2000). The small shared family range of female and young is probably the most efficient way of exploiting the favorable environment and the localized concentrations of resources. The large overlapping ranges of the males prevent excessive inbreeding, as does immigration of young males into new areas (Dards, 1978). The great variation in ranging behavior by male cats suggests that there would always be new available males to move into an area where the original cats had been removed. The implication of this is that neutering policies are unlikely to succeed unless attention is focused on females (Dards, 1983). Dr. Tommy Sade, the chief veterinarian of Jerusalem municipality says that the number of cats in a given area is determined by the amount of open refuse regardless of whether the cats are neutered (from a letter to Ehud Ulmert, Mayor of Jerusalem, 18/8/1998).

Domestic Cats' Reproduction, Kittens Survival, and Longevity

Domestic cats are intensive breeders, maybe due to the seasonal estrous cycle of the females, during which each female comes into heat several times until pregnancy or end of cycle (Gunther and Terkel, 2002). A female cat reaches reproductive maturity between 7 to 12 months of age can be in estrous as many as five times a year (Ogan and Jurek, 1997). The gestation period lasts 63 to 65 days (Nowak, 1991) and the average litter is four to six kittens (O'Donnell, 2001). Cats can reproduce any month of the year, where food and habitat is sufficient, an adult female may produce 3 litters per year. (Fitzwater, 1994).

In a study of farm cats in Illinois the survival rate of kittens in their first year of life was 1.5 kittens per female (Ogan and Jurek, 1997). In Rome, cats in their first year showed a 10 percent survival rate (Natoli, 1994 in: Gunther and Terkel, 2002). A similar survival rate was found for a cat population in a Japanese village (Izawa and Ono, 1986 in: Gunther and Terkel, 2002). The survival rate of adult cats over the age of one year as quantified in the Japanese fishing village was 90 percent (Izawa, 1984 in: Gunther and Terkel, 2002).

It appears that high population densities of street cats increase the risk of diseases in kittens. Because cats that belong to a social group may cooperate in caring for the young, a large number of kittens may play, sleep and eat together thereby inter-transmitting disease (Natoli, 1994 in: Gunther and Terkel, 2002). Many of the younger cats of the Portsmouth dockyard suffered bouts of flu, with running nose and clogged eyes. A number of cats also showed clouding of one eye, which often became completely opaque (Dards, 1978).

Longevity of stray cats is estimated at 4-5 years, while domestic cats can live 15-17 years as house pets (Ogan and Jurek, 1997).

Domestic Cats in Israel

Unfortunately, there are no studies about the impact of domestic cats on wildlife in Israel. Nor is there sufficient data about cat's numbers and distribution or about cat eradication and control programs. Hence, in this section, I bring singular examples, anecdotic incidents, and personal comments and observations of veterinarians, researchers and NRNPA (Nature Reserves and National Parks Authority) personnel. Because of the lack of research and data estimated cat numbers throughout this section are very rough and probably vastly under-estimated.

According to Shimshoni (1987) in 1987 the number of domestic cats in Israel was estimated more than 50,000 and a huge number of stray cats occurred all over the country. Today (2003), as in most developed countries, the number of households owning pet cats is increasing. Many people own one cat or more, and many feed stray cats in their yards, in the stairways of communal buildings and outside business places. The estimated number of domestic cats in Israel today is over 100,000

(General Procedure for the Handling of Street Cats proposed by the department for Veterinary Services in the Field, 2002). Dr. Zvi Galin, the chief veterinarian of the Tel Aviv municipality, assesses the number of owned cats in Tel Aviv alone as 60,000, according to a survey conducted by pet food marketing companies (pers. comm. with Prof. Yom-Tov 5/7/01).

Today (January 2003), the legal status of house cats is regulated by municipal bylaws in only a few cities in Israel. For example, in Jerusalem according to municipal bylaw for the supervision of cats and dogs (sub-section 5a) each cat owner must vaccinate his/her cat for rabies every year. According to sub-section 11(b) stray cats within the bounds of municipal jurisdiction may be caught and transferred to enclosure by a director or supervisor. If the cat cannot be caught it may be euthanized.

Correspondingly, in sub section 11(c) owned cats must wear a conspicuous collar.

Tel Aviv and Haifa municipalities do not have municipal bylaws regarding cats.

According to the General Procedure for the Handling of Street Cats proposed by the department for Veterinary Services in the Field (2002), regulations for vaccination of cats against rabies and the marking of domestic pet cats were prepared and authorized by the economic committee of the Knesset, have been signed by the minister of agriculture and will be published and implemented shortly.

Stray cats have a problematic status as “cultural refugees”. On the one hand, they are not owned, and therefore are not fully protected by humans, on the other hand they are not wild and are therefore, not protected by the NRNPA. As in most other countries stray cats are usually in very poor condition, more susceptible to hunger, injury, and life threatening disease, and parasites that can be passed on to humans, often via free roaming pet cats. There are numerous people and organizations protecting street cats. According to Dr. Zvi Galin (pers. comm. with Prof. Yom-Tov 5/7/01) there are 5000 families licensed to feed stray cats in Tel Aviv. In the campus of Tel Aviv University there are 15 feeding stations for cats, and a population of at least 200 cats of which approximately 150 are castrated (Dr. Zvi Galin pers. comm. with Prof. Yom-Tov 5/7/01). Dr. Andrea Yaffe, the chief veterinarian of Ramat Hasharon municipality, suggests that such feeding stations contribute to growth of rat populations since rats also consume the food there. He also thinks that castrated cats that don't spend any

time on courting and mating are left with more time to hunt than non-castrated cats (pers. comm. with Prof. Yom-Tov 5/7/01).

In the past some municipalities killed stray cats within their jurisdiction, however, animal rights' activists and organizations acted upon the animal welfare law, 1977 (section 491 and 651) in order to protect cats. Today only the municipality veterinarian is permitted to trap and handle stray cats. The health ministry published a general procedure according to which, the municipalities are permitted to trap and destroy cats only on the basis of a citizen's complaint regarding specific, troublesome cats. In such a case it is up to the municipality veterinarian to solve the problem accordingly to the General Procedure for the Handling of Street Cats published by the department for Veterinary Services in the Field, that specifies the procedure and methods for the capture, custody and elimination of stray cats.

It is nearly impossible to estimate the numbers and the extent of damage that truly feral cats cause to wild animals in Israel. However, according to researchers and NRNPA personnel, feral cats are found practically in every nature reserve and open area in Israel and have immense impact on wild animals. Michael Blecher, En Gedi reserve biologist, says that there are sightings of feral cats inside En Gedi reserve. He personally documented two of the sightings; one of a cat in the Dudim cave area, and the other is of a cat on a palm tree at the entrance to David stream (Michael Blecher, pers. comm. 2/2/01). He gives a very rough estimate of about 20 cats that are trapped each year in David stream area and in the reserve entrance.

Prof. Heinrich Mendelssohn claimed that feral cats are responsible for the disappearance of the rufous bush robin (*Cercotrichas galactotes*) a small song bird that builds its nest in hidden places, inside vegetation, close to the ground (Karpel, 2000). The NRNPA ranger, Amizur Boldo, suggests that the group of vertebrates most damaged by cats in Israel are reptiles (personal communication 26/11/02). Some species of reptiles, such as the green lizard (*Lacerta trilineata*), are thought to have disappeared completely in some areas, and mainly on Mt. Carmel due to cat activity (Mendelssohn and Yom-Tov, 1987).

NRNPA researcher, Oad Hatzoffe, requested the members of the ISRABIRDNET (Form of Israeli Birders) for records of incidents of cat predation on birds in Israel. In only three days he received many reports of specific sightings. For example: an adult

female merlin (*Falco columbarius*) was captured by a cat in Emek Hefer, a chiffchaff (*Phylloscopus collybita*) was taken by a cat in Sde Boker, and blackcap (*Sylvia atricapilla*) was killed by a cat in Neot Smadar. In Lotan, a corncrake (*Crex crex*), a bluethroat (*Luscinia svecica*) and some quails (*Coturnix coturnix*) were killed by cats. On several occasions quails were seen slaughtered by cats in Tel Aviv. In Maagan Michael cats feed regularly on coots (*Fulica atra*) and moorhens (*Gallinula chloropus*). In the backyard of Prof. Yom-Tov in Ramat Hasharon cats preyed on yellow vented bulbul (*Pycnonotus barbatus*), house sparrows, palm doves (*Streptopelia senegalensis*), black birds (*Turdus merula*), great tits (*Parus major*) and Agama lizards (*Agama stellio*) (pers. comm.).

Although documentation and data regarding the extent of damage cats cause to the wildlife in Israel are rare, the sporadic evidence and the many anecdotal incidences some of which were collected in a very short period of times (like the information from birders of the ISRABIRD form) show that predation occurs in widespread areas, in diverse habitats and affects various species, including raptors, song birds, water birds, reptiles and small mammals.

The policy of the NRNPA is that feral cats in wild habitats are considered a pest to the natural environment and to native wildlife. NRNPA regulations allow supervisors to shoot those cats. The usage of poisons is prohibited.

Table 1 shows the number of feral cats that were shot in Israel between 1997 and 2001 by NRNPA rangers and authorized hunters (Nemtzuv and Veksler, unpublished manuscript).

Table 1: the number of feral cats that were shot in Israel between 1997 and 2001:

Year	1997	1998	1999	2000	2001
Number of cats shot	1100	849	419	94	72

It is important to emphasize that the numbers given in table 1 are not the numbers of feral cats in Israel, but only a small proportion of it. These data only includes the incidents of cat shooting that were reported by rangers and hunters. Not all cases are reported, and data are often lost. Moreover, not all trapping and eradication operations

in the field are carried by the NRNPA rangers, often they are completed by the local municipalities. In En Gedi for example, the sanitation unit of the municipal council sometimes traps cats (Avi David, En Gedi reserve manager, pers. comm. 2/2/01) and their data are not included in the table above.

Table 1 shows a significant drop in the number of cats that were shot in 2000 and 2001. The reason is that during those years the shooting of cats was outlawed for a few month of each year as a result of public pressure by animal right movements.

According to Nemtzov and Veksler (unpublished manuscript), the number of cats shot by NRNPA supervisors is much smaller than the number cats eradicated by municipal veterinarians.

Municipality's by-laws encourage the neutering of domestic pet cats and some animal rights encourage and help finance programs of stray cats neutering. However, Dr. Tommy Sade, the chief veterinarian of Jerusalem municipality, says that "the neutering of some 2000 out of tens of thousands of cats that roam the streets of Jerusalem or Tel Aviv does not affect the total number of cats. As Prof. Mendelsohn said, the neutering of cats is negligible in proportion to the cats' success in reproduction. Hence, successful control of cats' numbers depends on appropriate handling of refuse in their environment" (from a letter to Ehud Ulmert, Mayor of Jerusalem, 18/8/1998).

According to Dr. Tommy Sade, in countries in which human refuse is handled and discarded off properly, the number of stray cats is significantly lower than in Israel.

Moral issues

Once caught by a cat, few birds and mammals survive. Even if they appear to have escaped, infection from the cat's teeth or claws or the stress of capture usually results in death (Coleman et al. 1997). Cat owners, that allow their cats to roam outside freely, as most owners of cats do, are likely to cause suffering to many small animals. In this instance the owner's action is witting (because the event is repetitive), probably not willfully cruel, but negligent in that the owner fail to prevent it happening. In most places cats are not controlled or supervised (whereas dogs usually are) and are allowed to kill whatever they want.

Animal right organizations often condemn hunting as a sport and laboratory experiments on animals. But if we look at the scale, the 378 registered hunters in Britain kill approximately 20,000 foxes, hare, deer and mink annually. There are about 3 million laboratory experiments on animals in Britain each year (Fox, 1995). In contrast, the 9 million cats in Britain are estimated to kill approximately 275 million animals a year (Woods et al. in press).

In reality, our ‘civilized society’ is anything but logical. The keeping of pet cats and the feeding of stray cats involve high levels of wildlife suffering and yet are acceptable to many in our society. If we make genuine progress in wildlife welfare the inconsistencies in attitude towards animal killing will have to be faced. Animal rights organizations and conservation groups should concentrate on educating the public to responsible pet keeping.

What can be done?

The Mammal Society ‘Look What the Cat Brought In’, the American Bird Conservancy ‘Cats Indoor Campaign’ and the Canadian ‘Cat in Kennel Campaign’ suggest a number of things responsible cat owners can do to minimize the effect of their cat on wild animals:

1. Keep your cat in at night or even better, keep it in a safe outdoor enclosure and encourage cat-owning neighbors to do the same
2. Spay or neuter cats between 8 weeks and 4 month of age.
3. Support cat licensing laws
4. Support humane removal of stray cats from neighborhoods and wildlife areas.
5. Fit your cat with a collar with a noisy bell.
6. Provide your cat with toys.
7. Feed the birds in your garden.

For more information look up the website:

The American bird Conservancy: Cats Indoor Campaign: www.abcbirds.org

The Canadian Cat in Kennels Program: Cats in Kennel Campaign:

<http://www3.sympatico.ca/samgreen/webcats.htm>

The mammal society: Look what the cat brought in! <http://www.mammal.org.uk/>

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