IMPACT OF FREE RANGING DOGS ON WILDLIFE IN ITALY

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ABSTRACT: The diffuse presence of free ranging dogs (non-controlled, stray, and feral) in Italy is considered a severe conservation threat because of the potential impact on the wolf and on other wildlife species. In particular, it is generally believed that non-controlled owned dogs are rapidly increasing their number, representing a major part of the problem. The present legal framework does not allow destruction of dogs and cats, and the management of these pet species is based on mandatory marking, and on capture of free ranging animals for perpetual captivation in public kennels. The present research was aimed to: 1) collect and analyze available information on the impact of free ranging dogs on the wolf and on wildlife; 2) census owned dogs in rural areas of Italy (including urban centers with less than 30,000 inhabitants); 3) estimate the proportion of owned dogs that are free to range; 4) assess the public perception of problems posed by free ranging dogs; 5) assess the public attitude toward management alternatives; and 6) define management guidelines. Free ranging dogs resulted to prey upon all ungulate species and colonial ground-nesting birds. Dogs are the main limiting factor in translocation projects involving roe and red-deer, and represent a key obstacle to the recolonization of central and southern Italy by these species. Impact on the wolf is also discussed. Dogs were censused through direct interviews to 2,903 Italian families, randomly selected by the electoral lists. The sample was homogeneously distributed in the country, in order to test for differences among areas (n=4 sub-regions: northeast, northwest, center, south and islands). The total number of dogs is estimated at 6,099,011 ± 307,234. Of these, 19.7% (n=1,209,973 ± 151,280) are free to range at least part of their time. Despite the lack of reliable data on the past dog numbers, we estimated an average 5% year increase of the total population of dogs. The high increase rate is explained by the limited number of sterilized females, and the consequent high percentage of females reproducing every year. Number of dogs is negatively correlated to the size of urban areas, and increases from north to south. Control by owners follows opposite patterns. Despite the increasing number of non-controlled dogs, Italians have a limited perception of the social, sanitary, and conservation risks caused by dogs: 51.1% of Italians consider that dogs do not represent a problem at all, and only 3.8% of the population considers the destruction of dogs an acceptable alternative to perpetual captivity.

KEY WORDS: stray dogs, non-controlled, wolf, competition, attitude, census, predation, policy, management, survey

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INTRODUCTION

The diffuse presence of free ranging dogs (non-controlled, stray, and feral) in Italy is considered a severe conservation threat, because of the potential impact on the wolf and on other wildlife species, and it is generally believed that a major part of the problem is represented by non-controlled owned dogs, which are rapidly increasing in number. The present Italian legal framework, introduced by the National Law n° 281 in 1991, does not allow culling of dogs and cats, and the management of these pet species is based on mandatory marking, and on capture of free ranging animals for perpetual captivation in public kennels.

The present survey, co-funded by the Italian Ministry of Agriculture, was planned within the implementation of the National Action Plan on the Wolf, and was aimed to: 1) collect and analyze available information on the impact of free ranging dogs on the wolf and on wildlife; 2) census owned dogs in rural areas of Italy (including urban centers with less than 30,000 inhabitants); 3) estimate the proportion of time owned dogs are free to range; 4) assess the public perception of problems posed by free ranging dogs; 5) assess the public attitude toward management alternatives; 6) assess the problems related to the application to the new legal framework; and 7) to produce guidelines for the management of free ranging dogs.

METHODS

To assess the impact of free ranging dogs on wildlife, we analyzed the available literature for Italy and the alpine region, and we requested unpublished data from researchers working in Italy on potential target species (ungulates, birds).

Dogs were censused through direct interviews to 2,903 Italian families, randomly selected from the electoral lists. In respect to the aims of the research, the census was focused to the rural areas of Italy, and urban areas over 30,000 inhabitants were thus excluded from the survey. The sample was homogeneously distributed in the country, in order to test for differences among areas (n=4 sub-regions: northeast, northwest, center, south and islands). A questionnaire was prepared, and previously tested on 100 families to allow updating. Interviews were performed using CAPI (Computer Assisted Personal Interviews) personal computers. Confidence limits (95%) were calculated following Hahn and Meeker (1991).

To assess problems related to the management of dogs, the authors directly interviewed several operators (veterinarians, forest service managers, managers of kennels, etc.).

RESULTS

Impact of Free Ranging Dogs on the Wolf and Wildlife

Free ranging dogs can affect the wolf conservation through different mechanisms. A potential threat is represented by the risk of hybridization, but although dog-wolf hybrids have been recorded in Italy (Boitani 1983), recent genetic analyses found no dog genes in the Italian wolf population, suggesting that large scale introgression between the two *taxa* has not yet occurred (Randi et al. In press). Dogs can also represent a source of pathologies for the wolf, including *Parvovirus* (Bailey et al. 1995), parasites, and sarcoptic mange (Guberti et al. 1993; Guberti and Francisci 1991). Competition for resources with the dog is also a potential threat for the wolf: in fact, in most cases, dogs and wolves have a largely overlapped food niche, and despite the wolf is generally dominant on the dog (i.e., Boitani et al. 1995; Fritts and Paul 1989), the enormous disproportion in the population sizes of the two taxa represents a potential advantage for the dog (Artois et al. 1985). In Italy, predation by free ranging dogs has been recorded on all ungulates including the wildboar (*Sus scrofa*), the roe deer (*Capreolus capreolus*), the fallow deer (*Dama dama*) and the red deer (*Cervus elaphus*). In the French Alps, Lecomte (1985) reported that dog predation represent 30.3% of the total deer mortality on the Alps (n=109), and 91.8% of moufflon (*Ovis [orientalis] musimon*) mortality (n=487). In the same area, Esteve (1984) estimated that dogs prey every year between 13% and 26% of the roe deer population. Such an impact is not selective; Borg (1962) reported that probability of being preyed by dogs does not significantly change between healthy and non healthy roe deer (40% and 43% of the total mortality, respectively). Predation by free ranging dogs is recorded also within the wolf distribution range: in a research on the ecology of the roe deer carried out in Tuscany in the 1995 to 1997 period, on a total of 16 mortality cases reported, dogs were responsible for two attacks, and wolves of three (Lovari unpubl.). Similar patterns also resulted in a research carried out in the northern Apennines, where on a total of five predations, two were by wolves, one by a dog, and the others were uncertain. In several roe deer and red deer translocation projects, dogs represented a major mortality cause, accounting for over 25% of the total losses (Perco et al. 1997; Scalera et al. 1998). The presence of free ranging dogs is a major cause affecting the probability of success in translocation projects of deer, both for the predation impact and for disturbance, and is a limiting factor to the expansion of deer in central and southern Italy (Perco and Perco 1979; Tosi and Toso 1992). Free ranging dogs also prey on livestock, thus increasing conflicts with breeders and indirectly promoting illegal control of wolves. Dogs are largely responsible for livestock losses: in France, before the arrival of the wolf, 0.5 to 2.5% of sheep and goats were preyed by dogs every year, with an overall impact on livestock not different from areas, as Tuscany, where the wolf is also present (Ciucci and Boitani 1998). Among dogs, Boitani et al. (1995) suggest, on the basis of evidences collected in central Italy, that non-controlled owned dogs can represent a major part of the problem.

Dogs cause the destruction of a large number of nests of colonial ground-nesting birds: in April 1999, five non-controlled dogs completely destroyed the largest flamingo colony of Italy (Cagliari, Sardinia), and the total destruction of water bird colonies caused by dogs is regularly reported in several lagoon complexes of Italy. Predation by dogs represent a major limiting factor for colonies of sea gulls: data referred to the islands around Sardinia showed that the density of Herring gull (*Larus cachinnans*) in islands with no dogs (n=64, density= 9.43, range 0.09 to 39) is much higher that in islands with dogs (n=6, density=0.49, range 0.13 to 1.21); the Aouduin's gull (*Larus aouduinii*) is never recorded on islands with dogs (Baccetti and Zenatello unpubl.).

Census of Dogs

34.3% ± 1.7 (conf. lim. 95%) of Italian families living in rural areas own dogs. The total number of dogs is estimated in 6,099,011 ± 307,234 (about 7,500,000 in all the country) (Figure 1). Considering the results of two previous censuses of dogs realized in Italy (1979, 1996), although conducted with different techniques, we estimated an average increase of the total population of dogs around 5% per year. This high increase rate is explained by the limited number of neutered females (16.7%), and the consequent high percentage of females reproducing every year (13.2 ± 3.4). Number of dogs is negatively correlated to the size of urban areas, and increases from north to south.

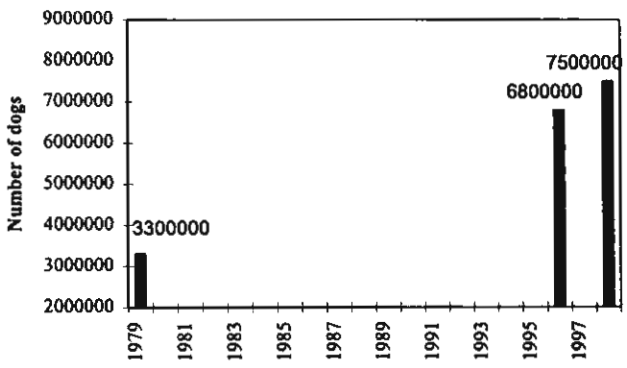

Figure 1. Number of dogs in Italy. Sources: Health Ministry (1979), DOXA Co. (1997), present research (1998).

Proportion of Non-controlled Owned Dogs

Of the total number of owned dogs present in the rural areas of Italy, 19.7% (n=1,209,973 ± 151,280) are free to range at least part of their time. Control by owners decreases from North to South, and an opposite trend was recorded for the frequency of health cares (Figure 2).

Figure 2. Proportion of dogs that are free to range part of their time.

Public Perception

Despite the increasing number of non-controlled dogs (63.1% of the interviewed directly observed non-controlled dogs in the previous month), Italians have a limited perception of the social, sanitary, and conservation risks caused by dogs: 51.1% of Italians consider that dogs do not represent a problem at all, and only 3.8% of the population consider the destruction of dogs an acceptable alternative to perpetual captivity.

Management

Interviews to veterinarians and managers involved in the management of free ranging dogs, revealed that the present legal framework has not been enforced, and is probably not enforceable. Two general problems were generally arisen: first of all the number of dogs' abandonments seems to be increasing, also because dog owners knows that an abandoned dog will never be euthanized; secondly local administrations, which are responsible for the perpetual maintenance of dogs in kennels, do not capture free ranging dogs anymore for the high costs of the maintenance. Also, the register system does not seem to work, as only 41.1% (± 3.06) of dog owners in the rural areas declared to have marked their dogs, and this is probably an underestimation, since the marking of dogs is mandatory.

CONCLUSIONS AND GUIDELINES

The number of non-controlled owned dogs is very high in Italy, and likely represent a large part of the total number of free ranging dogs. Problems deriving from the presence of free ranging dogs, including severe conservation threats, are rapidly increasing, also in respect to the dramatic increase in pet numbers registered in the last decades.

The impact of dogs on wildlife is generally underestimated by managers, and the reduction of such impact is not an aim of the management of dogs in Italy. In fact, the present legal framework addresses social aspects of the phenomenon, and does not include effective means to reduce the number of free ranging dogs in the rural areas of the country, and the impact on wildlife deriving from the diffuse presence of dogs, could become dramatic in the next future.

We propose several management guidelines, including: 1) the introduction of microchips for marking dogs; 2) the introduction of heavy fines for owners of non-marked dogs; 3) early sterilization of pups (50 to 60 days); 4) re-introduction of the possibility of euthanasia of dogs, after a reasonable period of maintenance in kennels; 5) re-introduction of the possibility of culling free ranging dogs, when an impact on wildlife species is proven; 6) inclusion of ecological aspects in the management of dogs. Nevertheless, the attitude of Italians does not support a stricter policy on free ranging dogs, and an information campaign on the conservation impact caused by free ranging dogs should thus be planned. Finally, we stress that, in respect to the magnitude of the phenomenon, none of the above guidelines can result effective to reduce significantly the problems related to free-ranging dogs, if not included in a global strategy.

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LITERATURE CITED

ARTOIS, M., J. BLANCOU, and C. KEMPF. 1985. Ecology and epidemiology of wild and feral canids in the Palearctic zone. Revue d'Ecologie, 40:2.

BAILEY, T. N., E. E. BANGS, and E. R. O. PETERSON. 1995. Exposure of Wolves to Canine Parvovirus and Distemper on the Kenai National Wildlife Refuge, Kenai Peninsula, Alaska, 1976-1988. Pages 441-446 *in* Ecology and Conservation of Wolves in a changing world, L. N. Carbyn, S. H. Fritts, and D. R. Seip, eds. Canadian Circumpolar Institute, Occasional Publication No. 35.

BOITANI, L. 1983. Wolf and dog competition in Italy. Acta Zool. Fenn., 174:259-264.

BOITANI, L., F. FRANCISCI, P. CIUCCI, and G. ANDREOLI. 1995. Population biology and ecology of feral dogs in central Italy. Pages 217-244 *in* The domestic dog: its evolution, behaviour and interaction with people, James Serpell, ed. Cambridge University Press, Cambridge.

BORG, K. 1962. Roe deer in Sweden. Int. Congr. Game Biol. 5:189-193.

CIUCCI, P., and L. BOITANI. 1998. Wolf and dog depredation on livestock in central Italy. Wildlife Society Bulletin, 26(3):504-514.

ESTEVE, R. 1984. Recensement du cheptel domestique et sauvage dont la mort est due à des

élément naturels ou à des animaux errants. Bulletin mensuel ONC, 80: 37-78.

FRITTS, S. H., and W. J. PAUIL. 1989. Interactions of wolves and dogs in Minnesota. Wildl. Soc. Bull. 17:121-123.

GUBERTI, V., L. STANCAMPIANO, and F. FRANCISCI. 1993. Intestina helminth parasite community in Wolves in Italy. Parassitologia, 35:59-65.

GUBERTI, V., and F. FRANCISCI. 1991. Cause di mortalità di 60 lupi raccolti in Italia dal 1984. Pages 599-603 *in* Spagnesi M, Toso S. Suppl. Ric. Biol. Selvaggina XIX.

HAHN, G. J., and W. Q. MEEKER. 1991. Statistical intervals: a guide for practitioners. John Wiley & Sons, Inc.

LECOMTE, J. 1985. Eco-ethologie des chiens errants: position du probleme. *In* Ecology and epidemiology of wild and feral canids in the Paleartic zone, M. Artois, J. Blancou, and C. Kempf, eds. Revue d'Ecologie, 40:2.

PERCO, F., and D. PERCO. 1979. Il Capriolo. Ed. Carso. Sgonico.

PERCO, F. R., R. SEMENZATO, and E. P. PERESIN. 1997. La reintroduzione del Capriolo (*Capreolus capreolus*) nel Parco del Ticino. Pages 729-735 *in* Atti del III Convegno dei Biologi della Selvaggina, M. Spagnesi, S. Toso e, P. Genovesi, eds. Suppl. Ric. Biol. Selvaggina XXVII.

RANDI, E., V. LUCCHINI, M. F. CHRISTENSEN, N. MUCCI, S. M. FUNK, G. DOLF, and V. LOESCHCKE. In press. Mitochondrial DNA variability in Italian and East European wolves: detecting the consequences of small population size and hybridisation. Conservation Biology, 14(2).

SCALERA, R., M. MAFAI-GIORGI, L. MATTEI E, L. BOITANI. 1998. Page 111 *in* La reintroduzione del cervo e del capriolo nel Parco Nazionale della Majella. Riassunti del II Congresso Italiano di Teriologia.

TOSI, S., and S. TOSO. 1992. Indicazioni generali per la gestione degli Ungulati. Instituto Nazionale di Biologia della Selvaggina, Documenti tecnici, n. 11.