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Factors Related to Preferences for Trap–Neuter–Release Management of Feral Cats Among Illinois Homeowners

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ABSTRACT Populations of feral domestic cats have increased throughout the United States, affecting wildlife and warranting attention from a variety of management agencies. This contentious issue requires a greater understanding of public attitudes and preferences for population control. We used data from a 2004 mail survey of Illinois, USA, homeowners' attitudes towards wildlife and conservation to investigate support for the trap–neuter–release (TNR) of feral cats and to examine factors (demographic, experience, and wildlife values orientations) that may influence preference for TNR as a management option. Age, gender, and wildlife rights values orientations were significant predictors of preference for TNR, while negative experiences with feral cats were correlated with preferences for management options other than TNR. Investigations of public perceptions of feral cat management can help wildlife managers understand the growing public debate regarding feral cat management and provide appropriate input and educational materials regarding cat management and wildlife.

KEY WORDS feral cat management, Illinois, stakeholder perceptions, trap–neuter–release.

There are an estimated 60–100 million feral cats (abandoned cats and those born in the wild) in the United States (Coleman et al. 1997, Jessup 2004). Feral cats are a growing concern nationwide to diverse stakeholders in communities hosting populations of feral cats. Homeowners may be concerned about the welfare of cats living in the wild, as well as interactions (e.g., fighting, disease transmission) of their own pets with these homeless cats. Feral cats are also a concern to ornithologists and wildlife biologists because they pose a significant threat to native birds and small mammals upon which they prey (Crooks and Soule 1999, Pimental et al. 2000, Lepczyk et al. 2003, Jessup 2004, Kays and DeWan 2004). Cats hunt instinctively and this behavior, rather than need for food, drives taking of prey (Liberg 1984, Warner 1985). Free-ranging cats have a considerable impact on small mammals and birds, as well as on the broader health of the ecosystem through outcompeting native predators like foxes and by changing the community composition. Studies show that where feral cats are common, exotic rodents are also common, whereas native rodents are scarce (Crooks and Soule 1999, Hawkins et al. 1999, Kays and DeWan 2004). Where there is a desire to reduce the negative impacts of cats on bird and mammal populations, wildlife biologists and associated stakeholders need information on the most effective and socially acceptable means of reducing populations of feral cats.

Disagreement exists over how best to slow the growth of feral cat populations. Management of feral cats is a contested issue due to the emotional connections of many homeowners to these domestic animals. Numerous organizations (Alley Cat Allies, Best Friends Animal Society, Humane Society of the United States) defend the rights of cats to exist in the wild and create and maintain colonies for cats. Some stakeholders promote trap–neuter–release (TNR) programs as the solution to cat overpopulation. Studies have shown this method is ineffective at reducing cat populations (Clarke and Pacin 2002, Castillo and Clarke 2003, Winter 2004). Additionally, maintaining large numbers of cats in the wild through such programs does not address the resulting negative impacts, including predatory damage to wildlife populations and the threat of disease to people and wildlife (e.g., rabies, cat scratch fever, hookworms, roundworms, toxoplasmosis).

Because animal control shelters are often unable to implement programs to deal with overpopulation of feral cats, cities, counties, and states throughout the nation are experimenting with management options. These include TNR, managed cat colonies, trap and euthanization, and even instituting a bounty for cats (Randolph, IA), though each option has drawn extensive criticism. Currently, we do not fully understand which management option homeowners might prefer or what underlying values might promote such preferences. Moral or ethical judgments guiding attitudes towards feral cat management have been examined, approaching the issue from a perspective of feral cats as nuisance wildlife (Lauber et al. 2007). Ethical judgments differed among interviewees supporting and opposing fertility control as management for feral cats. Ethical concerns expressed by individuals supporting fertility treatment (TNR) for cats included concern over killing animals to satisfy human interests and protection of the individual animals (Lauber et al. 2007).

Though we are uncertain whether the general public views feral cats as wildlife or as domestic pets, attitudes towards feral cats and their management may be explained through consideration of the trend of changing attitudes towards wildlife. Attitudes towards wildlife are influenced by values. Values are enduring beliefs, the foundation for an individual's thought and action (Bright et al. 2000). Value orientations describe patterns of direction and intensity among a set of beliefs about wildlife across several dimensions (Fulton et al. 1996). Wildlife value orientations

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are changing as part of a broader shift in values from materialist to postmaterialist, additionally influenced by modernization and a rise in environmentalism and mutualism orientations (i.e., the belief that wildlife have rights; Inglehart 1997, Teel et al. 2007). Materialist values were prevalent when existence needs required the use of wildlife as a food source. Because this need has been alleviated in recent decades, human contact with wildlife changed and people now focus more frequently on caring and emotional bonding with wildlife (Teel et al. 2007). One postmaterialist goal involves progression toward a more humane society (Manfredo et al. 2003). Trends supporting this shift include the decrease in recreational hunting, growth of organizations addressing animal welfare issues, and emerging social conflict over issues involving wildlife (Teel et al. 2007). This value shift is related to urbanization and the increased affluence and education related to urbanization (Manfredo et al. 2003). The possibilities of shifting wildlife values orientations due to postmodernism theory (Manfredo et al. 2003) could translate to public support for feral cat existence and rights (pro-TNR) or for environmental protection and wildlife rights (anti-TNR or pro-euthanasia).

Few available data exist regarding public understanding of this sensitive and divisive issue, because few studies have documented attitudes of stakeholders towards management of feral cats in their regions or neighborhoods. Texas A&M University faculty and staff were equally split on whether or not the conservation of wild species was more important than the welfare of cats (Ash and Adams 2003). Survey respondents were likely to support cat control in areas where cats were near people, suggesting their primary concerns involved feral cat impacts on people rather than wildlife (Ash and Adams 2003). Ohio, USA, residents who owned cats were more likely to support TNR programs and the use of tax dollars for such programs to control populations of cats (Lord 2008). Majorities for each residential group examined (urban 79%, suburban 71%, rural 71%) agreed that TNR would be a good management tool for homeless cats, though many respondents also thought stray cats could not survive on their own. Preferences for other management strategies (capture and euthanize, capture and adopt) were not investigated in Lord's study.

No other studies have examined the relationships between demographic variables, wildlife value orientations, and attitudes toward management of feral cats, though demographics (including urban–rural residences, age, and gender) have been shown to be strong predictors of attitudes towards wildlife (Kellert and Berry 1980, Mankin et al. 1999). Gender is one of the most important demographic variables influencing attitudes toward wildlife and wildlife management (Kellert and Berry 1987, Dougherty et al. 2003). Place of residence has also been shown to influence attitudes and knowledge of Illinois, USA, residents towards wildlife (Mankin et al. 1999).

The issue of feral cat population control, including the social acceptability of TNR as a management strategy, is a high priority for some wildlife management agencies, such as the Illinois Department of Natural Resources (IDNR) offices. The IDNR received growing numbers of complaints from residents across the state about feral cats during the 3 years prior to this study. During 2006, through the adoption of HR 1235, the Public Health and Safety Animal Population Control Program, the state of Illinois began supporting National Feral Cat Day and endorsing TNR as the most effective and humane method of reducing Illinois' cat population (Illinois Department of Public Health 2006). Understanding how preferences for feral cat management relate to wildlife value orientations and demographics could help managers predict responses to actions and ordinances impacting cats. To address the need for understanding public attitudes towards cats, we 1) determined levels of support for TNR management of feral cats in Illinois; and 2) identified demographic, attitudinal, and experience variables that influenced preference for TNR management of feral cats.

METHODS

We used data from an 8-page self-administered survey (Wildlife and Conservation Survey) mailed to 2,600 randomly selected Illinois single-family homeowners, representative of urban and rural counties in Illinois in 2004 (Miller et al. 2007). The survey measured homeowner experiences, attitudes, and management preferences regarding a range of wildlife issues being addressed by the IDNR. We included questions regarding attitudes toward and possible management of feral cats. We mailed participants a cover letter, questionnaire, and postage-paid return envelope (hereafter referred to as questionnaire packet) during February 2004, as outlined by Dillman (2000). At intervals of 2 weeks, we mailed nonrespondents a reminder postcard, second questionnaire packet, second reminder postcard, and third questionnaire packet.

The questionnaire included 5 items related to feral free-ranging cats; dichotomous response variables measured 1) survey participants' perceptions of feral cats as a problem on their property, 2) as a problem in their neighborhood, 3) if feral cats were killing small birds and mammals, and 4) if the IDNR should manage feral cats. The fifth item was a nominal categorical variable that measured preference for IDNR actions regarding management of feral free-ranging cats. We asked respondents to choose between capture, neuter, and return; capture and euthanize; capture and keep in shelter; or other. We chose the term *capture* over *trap* because of possible negative perceptions associated with *trap*, because respondents could have interpreted that term to mean leg-hold traps. Because TNR was a primary concern for the IDNR, we focused our analysis on factors that contributed to preferences for TNR by converting responses to the fifth item to a binomial variable. We coded preference for TNR as 1 and collapsed all other responses into a single other category (coded 2). We then used the resulting dichotomous variable (TNR vs. other) as the dependent variable in subsequent logistic regression models.

We asked homeowners to identify their community as 1 of 6 types, ranging from rural (farm or nonfarm) to large city >1 million people. Categories for community sizes corresponded to other studies conducted through the Illinois Natural

Table 1. Bivariate analysis of demographic variables of preference for trap, neuter, and release (TNR) management of feral cats among Illinois, USA, homeowners (n = 1,680) in 2004.

Demographic variable	Prefer TNR		χ^2 or F-value	P	Cramér's V or Eta
	% yes	% no			
Community size			19.37	<0.001	0.143
Rural	16.3	83.7			
Small town (<10,000)	26.4	73.7			
Small city (10,000–100,000)	30.3	69.7			
Urban (>100,000)	35.9	64.1			
Gender			63.62	<0.001	0.257
F	47.3	52.7			
M	20.4	79.6			
Education			11.57	0.116	0.110
<high school	30.2	69.8			
High school/tech school	21.4	78.6			
Some college/associate degree	29.2	70.8			
Bachelor degree	28.7	71.3			
Graduate or professional	28.1	71.9			
Age (mean yr)	50.4	52.7	1.31	0.046	0.101

History Survey. We collapsed responses into 4 community types: rural, small towns of <10,000 people, small cities of 10,000 to <100,000, and urban areas >100,000 people (U.S. Census Bureau 2000). We measured wildlife value orientations through expressed attitudes towards wildlife using a series of 12 statements with a 7-point Likert-type scale (1 = strongly disagree, 4 = unsure, 7 = strongly agree; Bright et al. 2000, Manfredo et al. 2003, Miller et al. 2007). We used principal components analysis (PCA) with Varimax rotation to determine factor groups corresponding to value-orientations (Miller and Vaske 2003). We tested variables in each factor identified through PCA for reliability using Cronbach's alpha, then totaled and divided each by the number of variables in the factor to form single index variables representing each wildlife value orientation. We tested differences in responses by preference for management method using Pearson's chi-square for categorical variables and one-way analysis of variance (ANOVA) for continuous variables. We tested group size effect for each variable using Eta (for dichotomous independent variables in ANOVA tests) and Cramér's V (for independent categorical variable with >2 categories). Values for both Eta and Cramér's V <0.5 suggest no group size effect (Vaske 2008). We used logistic regression to examine significance of demographics (age, community, and gender), experiences with feral cats, and value orientation towards wildlife on management preference of feral cats. We developed a series of partial models using forward stepwise logistic regression that tested like variables (i.e., demographics, experience, and values orientation). We then composed a full model consisting of significant predictors from the partial models. We used SPSS version 15.0 (Statistical Package for the Social Sciences, Chicago, IL) to analyze all data from returned questionnaires.

RESULTS

Of the 2,600 survey questionnaires mailed to Illinois homeowners, we received 1,680 completed questionnaires for a total response rate of 65% (discounting undeliverable questionnaires) with a sampling confidence interval of 1.83.

A majority of respondents from each of the 4 community sizes preferred methods other than TNR (capture and keep in shelter, capture and euthanize) to handle the issue of feral cats. Only 16% of respondents from rural areas preferred TNR to control populations; preference for TNR increased with increase in community size from rural to urban residences (36% of urban residents chose TNR, compared to 16% of rural).

Bivariate analysis showed community size, age, and gender to be significant predictors of preference for TNR (Table 1). More females (47%) than males (20%) preferred TNR to control populations of feral cats. Preference for TNR was not significantly related to education level; however, it was preferred the least by respondents with a high school degree (21%) and preference was similar among respondents with some college, a bachelors, or graduate degree (28–29%). Support for TNR was strongest among those who did not finish high school (30% chose TNR). Results of the ANOVA model indicated significant differences in mean age of respondents by preference for TNR or other methods.

A majority of respondents (67%) had not experienced problems with feral cats on their property, killing birds or small mammals (78%), or scaring birds from birdfeeders (84%; Table 2). Experiences with feral cats were related to preference for feral cat TNR; if feral cats were causing

Table 2. Illinois, USA, homeowners' (n = 1,680) experiences with feral cats, 2004.

Experience questions[a]	% yes	% no
Have you ever had a problem with feral housecats on your property?	33.0	67.0
Have you ever had a problem with feral housecats killing birds or small mammals on your property?	21.6	78.4
Have you experienced feral cats scaring birds from your birdfeeder?	15.9	84.1

[a] Cronbach's α = 0.843.

Table 3. Principal components analysis[a] of attitudes toward wildlife populations, rights, and funding among Illinois, USA, homeowners, 2004 (n = 1,680).

Statement	Existence values	Wildlife rights values	Wildlife funding values
Healthy populations of fish and wildlife are important to me	0.0914		
We should be sure future generations have an abundance of fish and wildlife	0.0927		
Whether or not I see fish and wildlife it is important to know they exist	0.0808		
Loss of habitat has more impact on wildlife populations than hunting	0.0794		
Wildlife should have the same rights as people		0.0653	
Rights of wildlife to exist are more important than human use of wildlife		0.0645	
Hunting is cruel and inhumane to animals		0.0787	
Wildlife should have the same rights as pets but not humans		0.0696	
Hunting for trophy animals should not be tolerated		0.0727	
Some species are not worth spending money to save			0.0719
Endangered species should be protected even at the cost of the economy and jobs (reverse coded)			0.0720
Too much attention is given to wildlife in our society			0.0792
Cronbach's α	0.819	0.775	0.627

[a] Kaiser-Meyer-Olkin = 0.810.

problems on residents' property and killing birds and small mammals, respondents were less likely to support the TNR management option. Experience variables remained significant predictors ($P \leq 0.001$) in the full logistic regression model.

Principal components analysis identified 3 components of attitudes towards wildlife: 1) wildlife existence values, 2) wildlife rights, and 3) funding for wildlife (Table 3). Wildlife existence value orientations were significant predictors of preference for management options other than TNR, whereas wildlife rights value orientations were significant predictors of preference for TNR in the Wildlife Values partial model (Table 4). Support for wildlife rights ($P \leq 0.001$) remained a significant predictor of support for feral cat control in the full model.

DISCUSSION

Unlike the Ohio study (Lord 2008), we did not find overwhelming support for the practice of TNR feral cat management; however, we did find significant differences in management preference according to community size. Our results suggest that residents of urban areas are more likely than rural communities to support TNR of feral cats as a management tool. This finding could be related to previous studies that found few metropolitan Illinois residents supported hunting and perceived wild animals similar to pets (Mankin et al. 1999). Our results support the shifts in attitudes towards wildlife and environmental protection that Manfredo et al. (2003) discussed as a result of postmodernism (affluence and urbanization). Population estimates of feral cats in rural, suburban, and urban areas of Illinois do not exist, though tolerance for cats and management options may be influenced by high densities of cats in some respondents' communities.

Attitudes among females were significantly related to preference for feral cat TNR. Kellert and Berry (1980) found women to be much more moralistic and humanistic in their regard for wildlife and this may explain their preference for TNR (favoring keeping cats alive). In general, women show greater emotional affection toward individual animals and are more concerned with animal cruelty; this can influence opposition to hunting and lethal control methods (Kellert and Berry 1987, Sanborn and Schmidt 1995, Connelly and Decker 1996, Lauber and Knuth 1998). Women may agree that TNR is a more humane option whether they view feral cats as wildlife or as homeless pets. Age has been shown to

Table 4. Logistic regression model predicting support for trap, neuter, and release management of feral cats among Illinois, USA, homeowners (n = 1,680) in 2004.

	Partial models[a]				Full model			
Model variables	β	Wald	Odds ratio	P	β	Wald	Odds ratio	P
Demographics model								
Community	0.25	9.28	1.28	0.002				0.313
Gender	−1.26	55.34	0.283	0.001	0.91	24.35	2.48	<0.001
Education				0.529				
Age	−0.01	3.88	0.990	0.048	−0.01	6.03	0.99	0.014
Experience model								
Problem on property	−0.695	9.44	0.499	0.002	−0.942	30.12	0.390	<0.001
Feral cats killing birds–mammals	−0.65	10.56	0.525	0.001	−1.01	24.96	0.366	<0.001
Feral cats scaring birds				0.602				
Value-orientations model								
Existence	−0.20	6.11	0.819	0.013				0.371
Rights	0.50	74.12	1.64	<0.001	0.392	36.04	1.48	<0.001
Funding				0.201				

[a] Significant results from each of the partial models (demographics, experience, and value-orientations) were included in a full logistic regression model.

influence attitudes towards wildlife and wildlife management; younger adults are less utilitarian oriented and more concerned with wildlife protection than older adults (Kellert and Berry 1980).

We did not find preference for TNR to be related to respondents' level of education. These findings suggest that the issue is not related to formal education level, but to attitude formation based on values and beliefs. Underlying values that influence such attitudes are difficult to change; however, the effect of targeted education programs has not been explored.

When we examined the effect of wildlife value orientations on preference for feral cat TNR, we found support for Wildlife Rights value orientations to be a predictor of preference for TNR. Respondents may view cats as wildlife and may support their right to exist in the environment even though they realize the need for management. Respondents who expressed Wildlife Rights value orientations were more likely to prefer TNR over euthanization. This expression could be explained from 2 perspectives: 1) certain segments of the population view feral cats as wildlife, and 2) perceive feral cats in the same manner as pets.

Given publicly expressed opposition from animal welfare advocates and animal rights organizations, many wildlife population management techniques, especially lethal control, may be viewed as unacceptable by a growing proportion of the public (Zinn et al. 1998, Agee and Miller 2009). Animal activists have become increasingly effective at using policy to advance agendas (Muth and Jamison 2000), as well as raising public awareness of animal welfare through media campaigns. Understanding stakeholders' perceptions of management options and how such perceptions relate to wildlife value orientations can enable a stronger understanding of the extent to which public stakeholders agree with the views expressed by such animal welfare and cat advocacy groups. Often the most socially acceptable wildlife management strategy does not involve lethal control and is known to be ineffective at controlling populations or their negative impacts; examples include black bear (*Ursus americanus*) management in New Jersey, USA (Fraker et al. 2006), wild horses (Taggart 2008), and feral hogs (*Sus scrofa*; Maguire 2004). Understanding preferences of feral cat management may extend to other relevant situations in invasive species management, especially when the species under consideration is domestic.

MANAGEMENT IMPLICATIONS

Public awareness of the problems resulting from feral cats may be growing. Further studies should include a greater geographic extent because regional differences in attitudes and preferences may exist. In general, managers do not have sufficient information as to how the public views feral cats, yet local municipalities continue to change ordinances to support the practice of TNR, appeasing many local cat caretakers but creating conflict with stakeholders concerned with wildlife populations. Further investigations of perceptions of feral cats will help local managers make more informed decisions and aid in understanding public conflict regarding options for feral cat management. Moreover, it is important for managers to identify public knowledge of impacts on wildlife related to feral cats. Such information may assist in developing information and education programs designed to better inform public stakeholders of the impact of feral cats in reducing native wildlife populations.

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LITERATURE CITED

Agee, J., and C. A. Miller. 2009. Factors contributing toward acceptance of lethal control of black bears in central Georgia, USA. Human Dimensions of Wildlife 14:198–205.

Ash, S. J., and C. E. Adams. 2003. Public preferences for free-ranging domestic cat management options. Wildlife Society Bulletin 31:334–339.

Bright, A. D., M. J. Manfredo, and D. C. Fulton. 2000. Segmenting the public: an application of value orientations to wildlife planning in Colorado. Wildlife Society Bulletin 28:218–226.

Castillo, D., and A. L. Clarke. 2003. Trap/neuter/release method ineffective in controlling domestic cat colonies on public lands. Natural Areas Journal 23:247–253.

Clarke, A. L., and T. Pacin. 2002. Domestic cat colonies in natural areas: a growing exotic species threat. Natural Areas Journal 22:154–159.

Coleman, J. S., S. A. Temple, and S. R. Craven. 1997. Cats and wildlife: a conservation dilemma. Cooperative Extension Service, Madison, Wisconsin, USA.

Connelly, N. A., and D. J. Decker. 1996. Overcoming constraints to women's participation in consumptive uses of fish and wildlife. Transactions of the North American Wildlife and Natural Resources Conference 61:379–387.

Crooks, K. R., and M. E. Soule. 1999. Mesopredator release and avifaunal extinctions in a fragmented system. Nature 400:563–566.

Dillman, D. A. 2000. Mail and internet surveys—the tailored design method. John Wiley & Sons, New York, New York, USA.

Dougherty, E. M., D. C. Fulton, and D. H. Anderson. 2003. The influence of gender on the relationship between wildlife value orientations, beliefs, and the acceptability of lethal deer control in Cuyahoga Valley National Park. Society and Natural Resources 16:603–623.

Fraker, M. A., P. D. Curtis, and M. Mansour. 2006. An analysis of the feasibility of using fertility control to manage New Jersey black bear populations. Terramar Environmental Research, Ashland, Oregon, USA.

Fulton, D. C., M. J. Manfredo, and J. Lipscomb. 1996. Wildlife value orientations: a conceptual and measurement approach. Human Dimensions of Wildlife 1:24–47.

Hawkins, C. C., W. E. Grant, and M. T. Longnecker. 1999. Effect of subsidized housecats on California birds and rodents. Transactions of the Western Section of the Wildlife Society 5:29–33.

Illinois Department of Public Health. 2006. Animal population control program publication. <http://www.idph.state.il.us/envhealth/pdf/Animal_Population_Control.pdf/>. Accessed 6 Feb 2009.

Inglehart, R. 1997. Modernization and post modernization: culture, economic, and political change in 43 societies. Princeton University Press, Princeton, New Jersey, USA.

Jessup, D. A. 2004. The welfare of feral cats and wildlife. Journal of the American Veterinary Medical Association 225:1377–1383.

Kays, R. W., and A. A. DeWan. 2004. Ecological impact of inside/outside house cats around a suburban nature preserve. Animal Conservation 7:273–283.

Kellert, S. R., and J. K. Berry. 1980. Knowledge, affection and basic attitudes toward animals in American society. United States Department of the Interior, Fish and Wildlife Service. U.S. Government Printing Office, Washington, D.C., USA.

Kellert, S. R., and J. K. Berry. 1987 . Attitudes, knowledge, and behaviors toward wildlife as affected by gender. Wildlife Society Bulletin 15:363–371.

Lauber, T. B., and B. A. Knuth. 1998. Suburban residents' attitudes towards contraception and other deer management techniques. Human Dimensions Research Unit, Cornell University Department of Natural Resources, Ithaca, New York, USA.

Lauber, T. B., B. A. Knuth, J. A. Tantillo, and P. D. Curtis. 2007. The role of ethical judgments related to wildlife fertility control. Society and Natural Resources 20:119–133.

Lepczyk, C., A. G. Mertig, and J. Liu. 2003. Landowners and cat predation across rural to urban landscapes. Biological Conservation 115:191–201.

Liberg, O. 1984. Food habits and prey impact by feral and house-based domestic cats in a rural area in southern Sweden. Journal of Mammalogy 65:424–432.

Lord, L. K. 2008. Attitudes toward and perceptions of free-roaming cats among individuals living in Ohio. Journal of the American Veterinary Medical Association 232:1159–1167.

Maguire, L. A. 2004. What can decision analysis do for invasive species management? Risk Analysis 24:859–868.

Manfredo, M. J., T. L. Teel, and A. D. Bright. 2003. Why are public values toward wildlife changing? Human Dimensions of Wildlife 8:287–306.

Mankin, P. C., R. E. Warner, and W. L. Anderson. 1999. Wildlife and the Illinois public: a benchmark study of attitudes and perceptions. Wildlife Society Bulletin 27:465–472.

Miller, C. A., L. P. Campbell, P. D. Leiter, and C. J. Colligan. 2007. Comparison of attitudes of hunters and illinois residents toward wildlife conservation. Federal Aid Project W-112-R-13, Illinois Natural History Survey, Champaign, USA.

Miller, C. A., and J. J. Vaske. 2003. Individual and situational influences on declining hunter effort in Illinois. Human Dimensions of Wildlife 8:263–276.

Muth, R. M., and W. V. Jamison. 2000. On the destiny of deer camps and duck blinds: the rise of the animal rights movement and the future of wildlife conservation. Wildlife Society Bulletin 28:841–851.

Pimental, D. L., R. Lach, R. Zuniga, and D. Morrison. 2000. Environmental and economic costs of nonindigenous species in the United States. BioScience 50:53–65.

Sanborn, W. A., and R. H. Schmidt. 1995. Gender effects on views of wildlife professionals about wildlife management. Wildlife Society Bulletin 23:583–587.

Taggart, J. B. 2008. Management of feral horses at the North Carolina National Estuarine Research Reserve. Natural Areas Journal 28:187–195.

Teel, T. L., M. J. Manfredo, and H. M. Stinchfield. 2007. The need and theoretical basis for exploring wildlife value orientations cross-culturally. Human Dimensions of Wildlife 12:297–305.

U.S. Census Bureau. 2000. Urban and rural classifications. Department of Commerce, U.S. Census Bureau, Geography Division, Washington, D.C., USA.

Vaske, J. J. 2008. Survey research analysis: applications in parks, recreation, and human dimensions. Venture, State College, Pennsylvania, USA.

Warner, R. E. 1985. Demography and movements of free-ranging domestic cats in rural Illinois. Journal of Wildlife Management 49:340–346.

Winter, L. 2004. Trap–neuter–release programs: the reality and the impacts. Journal of the American Veterinary Medical Association 225:1369–1376.

Zinn, H. C., M. J. Manfredo, J. J. Vaske, and K. Wittman. 1998. Using normative beliefs to determine the acceptability of wildlife management actions. Human Dimensions of Wildlife 11:649–662.

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