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THE MASS MEDIA AND STAKEHOLDERS' BELIEFS ABOUT SUBURBAN WILDLIFE

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Abstract: This study examines how suburban audiences obtain information about 3 species in New York State (whitetail deer [*Odocoileus virginianus*], beaver [*Castor canadensis*], and Canada goose [*Branta canadensis*]). Respondents in 3 suburban areas were surveyed on concerns and interests about a particular species in their area. Respondents also were surveyed about preferred sources for species information and actual source use. Finally, respondents were surveyed about general media use. "Uses-and-gratifications" theory was used to characterize respondents' information behavior for species information. Specific recommendations for communication planning are offered.

Key Words: beaver, *Branta canadensis*, Canada goose, *Castor canadensis*, mass media, New York, *Odocoileus virginianus*, stakeholders, survey, white-tailed deer

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INTRODUCTION

Over 25 years ago, Gilbert (1971) emphasized the importance of effective public communication for natural resource management. He recognized that natural resource managers, experts in fields such as wildlife, forestry, and fisheries, typically lacked a comprehensive understanding of the users of these resources or of ways to communicate effectively with them. Decker (1985) found communication with the public to be the least positive element of wildlife agency image among a variety of populations studied. Lautenschlager and Bowyer (1985) suggested that wildlife professionals need to develop good communication practices or risk the long-term survival of the profession. More recently, Gray (1993:206) emphasized—perhaps overstated—the continuing difficulty that wildlife managers have had regarding public communication:

“Failure to communicate effectively with the general public seems to be a problem with wildlife personnel at all levels, from technicians to administrators. Yet the success of many wildlife agency initiatives absolutely depends on the ability of wildlife professionals to successfully communicate with their specialized publics and with the citizenry at large.”

Agency communication efforts targeted at residents of suburban areas especially may be challenging due to (1) the diversity of beliefs and attitudes regarding wildlife that exist among residents in these areas (Decker and Richmond 1993) and (2) the lack of longstanding relationships between agencies and suburban residents (Schaefer 1987). Fortunately, wildlife agencies generally recognize the importance of understanding beliefs, attitudes, and experiences of stakeholders (Decker et al. 1992), but they may not be incorporating such understanding into communication planning. In addition to the challenge of understanding beliefs and attitudes and using that understanding in communication, wildlife professionals must learn how to develop communication strategies that fit the needs and desires of suburban residents.

Still, wildlife professionals often tend to see communication simply as “persuasive” activities with various stakeholder audiences, particularly regarding agency programs and controversial wildlife policies. For instance, wildlife professionals sometimes suggest that communication efforts are necessary to help “educate” suburban residents who might not understand the “facts” of a given management situation (Decker and Gavin 1985, DeBruyckere and Garr 1991, Hadidian 1992). In such cases,

the goal of agency communication with suburban residents tends to be support for specific programs or management actions that wildlife management agencies recommend (Schaefer 1987).

Most of this kind of communicative activity occurs within a relatively short time period. We argue that successful communication strategies involve more than the short-term, campaign-oriented approaches that typically are followed. Indeed, short-term, persuasive communication strategies likely will be unsuccessful if intended audiences do not have values, beliefs, or experiences in common with the communicator. Lacking such commonality, improving understanding of factual information in the short term necessarily will not change attitudes or behaviors (National Research Council 1989) and could even lead to unintended backlash effects.

One reason that short-term campaigns rarely succeed is that stakeholder audiences form beliefs over long time spans, and they generally acquire knowledge that relates to beliefs and attitudes from a variety of sources. One of the most important sources is the mass media, which cultivate beliefs about a variety of types of environmental information (Shanahan, et al., 1997). If wildlife professionals do not understand the dynamics of mass communication processes, which have the power to cultivate audience members consistently and cumulatively with bits of information about wildlife management, they likely will mount unsuccessful specific short-term communication campaigns.

Although mass media processes never will be fully under the control of wildlife professionals, agency personnel should obtain better understanding of how these processes work. In this paper, we examine concepts from the “uses-and-gratifications” approach to mass communication research to help understand suburban residents’ motivations to seek particular types of information regarding 3 problem-causing species, sources of information they have used to gain information about those species, and their general use of media. In addition, relationships between residents’ information-seeking motivations and their attitudes, interests, concerns, and acceptance of management actions for problem species are examined. Finally, we provide policy recommendations on how wildlife

professionals can best use information on mass media use to achieve their goals.

Media and Wildlife

We believe the media “uses-and-gratifications” approach has potential to yield information that can be used to facilitate on-going, proactive communication strategies for wildlife species that cause problems in suburban areas. Suburban wildlife problems generate particular media issues, given that suburban residents rarely have direct knowledge of or experience with wildlife behavior and thus they rely on the media for impressions about problem species. Three species that cause widespread problems in suburban areas of many Eastern states are white-tailed deer (*Odocoileus virginianus*), beaver (*Castor canadensis*) and Canada geese (*Branta canadensis*). New York State is no exception, with all 3 identified by the New York State Department of Conservation’s (DEC) Bureau of Wildlife (BOW) as creating problems for residents in suburban areas. Problems commonly associated with deer include motor vehicle accidents, damage to gardens and shrubs, and the transmission of Lyme disease to humans (Decker and Gavin 1985, Curtis et al. 1993). Beavers plug culverts, flood highways and residential subdivisions, and destroy trees and shrubs valued for economic, aesthetic, and other attributes (Ermer 1988, Harbrecht 1991). Canada geese damage or diminish aesthetic attributes of lawns, docks, swimming pools, and golf courses (Cleary 1983).

Because diverse viewpoints exist among suburban residents (Decker and Richmond 1993), controversy often emerges regarding human-wildlife interactions and the types of wildlife management actions taken to ameliorate problems. Controversy invariably attracts and is magnified by media attention, which means the media often get to play a significant role in constructing perceptions of suburban wildlife problems. Therefore, increasing public understanding of complex suburban wildlife situations and minimizing public contention can be a daunting challenge for wildlife professionals. Determining the public’s informational needs regarding wildlife and filling these needs via planned, continual, and comprehensive communication and research is an essential step toward meeting this challenge.

Media Uses and Gratifications

“Uses-and gratifications” is an approach that seeks to increase understanding of both *how* and *why* people use particular media (Infante, 1993). In “uses-and-gratifications” research, *how* questions deal with specific uses of the media: what media, when, or how long, whereas *why* questions deal with people’s gratifications: what do people “get out of” the particular media to which they attend? Overall, “uses-and-gratifications” research assesses how media use “gratifies” individual needs, desires, and proclivities. It “...attempts to explain the uses and functions of the media for individuals, groups, and society in general” (Infante 1993:405).

Descriptive knowledge of audience intentions in using mass media helps guide effective media and communication strategies. Thus, research into audience uses of media often is recommended during the development phase of communication plans (Severin and Tankard 1992). During the initial formation of communication plans, this descriptive information helps predict the ways in which (and ideally why) audiences turn to specific media. Thus, we chose this approach because it provides a practical and straightforward way for wildlife professionals to understand and analyze public informational needs regarding wildlife and how these needs can be met through media sources and channels.

Applying aspects of the “uses-and-gratifications” approach, we categorized suburban residents along dimensions of information-seeking motivation and media use to answer the question of how citizens get information about wildlife. We examined relationships between these dimensions and other factors, such as attitudes and concerns about a given species, to see why they might use such sources. Finally, we looked at relationships between information-seeking motivations and particular media use to show how wildlife agencies can think about appropriate channels for wildlife information. For example, a wildlife agency might want to know what type of information suburban residents who have serious concerns about wildlife-related damage would seek, if any, and then compare that to the information the agency actually provides. Also, using the information provided by such a study, the agency then could select appropriate channels for disseminating its persuasive messages.

Insights about information-seeking motivations and general media use of target audiences can be used as part of a comprehensive plan to improve communication with the public about wildlife issues. As we will argue, the “uses-and-gratifications” approach offers a practical tool of a type not yet used systematically in communication planning regarding wildlife.

The “uses-and-gratifications” approach provides important information for wildlife managers who deal with problem species in suburban areas by addressing 2 key issues:

1. What information-seeking motivations regarding the referent species exist for suburban residents with particular characteristics (e.g., interest in seeing the referent species; concern about damage caused by the referent species)?
2. What are the best ways to reach those residents who desire information regarding the referent species (i.e., what sources have they used to obtain information regarding the referent species? how often do they use various types of media?)?

METHODS

A literature review and qualitative interviews were conducted to improve understanding of the human dimensions of suburban wildlife situations. Interviews were conducted with BOW staff ($n = 33$) and other stakeholders (e.g., residents affected by the species of interest, community leaders; $n = 32$) in the management of deer, beaver, and Canada geese in suburban areas. Three groups of BOW staff were selected for interviews: the staff of the BOW’s Communication Unit; program leaders for deer, beaver, and Canada geese; regional managers and staff most familiar with the three species. Input from the interviews was used to develop a mail-survey instrument. The instrument was reviewed by Cornell University survey research specialists and pre-tested in 3 suburban areas (different from those selected for the final survey).

Survey Sampling, Inc., a private firm, was hired to provide a random sample of residents who lived within the geographic parameters chosen in the 3 geographic areas designated by BOW as having a history of or potential problems with

deer, beaver, of Canada geese. The goal was to contact residents who likely had some experience with or were aware that the species existed in their area, so the sample was drawn from census tracts (each containing approximately 3,000 people) and census block areas (each containing approximately 1,000 people) where such experience was likely. Names, addresses, and telephone numbers for people who lived within the specified areas were selected randomly from a telephone directory database. The person listed in the telephone directory was the person whom we requested to complete the questionnaire.

Study Areas

Residents who lived within specified census tracts or census block groups in 3 areas were questioned regarding their attitudes about the relevant problem species in their area: deer in the eastern portion of the Town of Amherst, beaver in the City of Oneonta, and geese in the Merritts Pond area of the City of Riverhead, respectively. Based on 1990 Census Bureau information, the population of the Amherst census tracts was approximately 41,621 and primarily Caucasian. The median age of the adult (>18 years of age) population was 46.5 years, and slightly more females than males lived in the study area. A majority (70%) of the population >25 years of age had received at least some college education. The population of census tracts that corresponded to the City of Oneonta was 9,123 and also predominantly Caucasian. The median age of the adult population was 37 years. Slightly more females than males lived in this area (5,034 vs. 4,089). A majority (52.5%) of the population >25 years of age had received some college education. Finally, the population of census block groups in Riverhead (Merritts Pond area) was 3,030 and primarily Caucasian. The median age of this population was 46 years, and a small majority was female. Approximately one-third (32.4%) of residents >25 years of age had received some college education.

Measures

Three measures were developed to obtain information about residents': (1) motivation to seek specific types of information regarding the species of interest; (2) information sources residents actually used to obtain information about the species; and (3) residents' general media use. We wanted to determine the likelihood that residents would seek specific types

of information regarding the referent species. We asked respondents to tell us how likely they would be to seek information about the following topics:

1. Population biology and habitat of the referent species.
2. Prevention of damage to property from the referent species.
3. Hunting/trapping of the referent species.
4. Viewing and photographing the referent species.
5. Animal rights.
6. Contraception for the referent species.
7. State management programs for the referent species.

These data were used in a principal-components factor analysis (Bollen 1989) to identify broader types of information-seeking behavior.

The next measure focused on the frequency with which people, in their daily lives, used various media channels and types. Residents were asked to report how often they did the following activities:

1. Watch television programs (hours/ day)
2. Watch local television news pro-grams (days/week)
3. Read the local daily paper (name of paper inserted--days/week)
4. Read the local weekly paper (name of paper inserted--days/month)
5. Read news magazines (number/ month)
6. Read wildlife or nature magazines (number/month)
7. Read hunting magazines (number/ month)
8. Read animal rights magazines (number/month)
9. Listen to the radio (hours/day)
10. Watch video cassettes (number/ week)

Again, we used principal-components factor analysis to group the above items into factors that represent categories of media use.

The third measure focused on the specific sources that residents actually used to obtain information about referent species. We asked residents to indicate, from a predetermined list of sources identified in the interview phase of the study, which resources they had used to gather

information about referent species. The 15 sources we identified were:

1. Local newspapers
2. Family members
3. New York State Department of Environmental Conservation (DEC) publications
4. Animal rights group publications
5. Friends/neighbors
6. Local television news
7. Personal observations
8. Hunting group publications
9. Local governmental reports
10. Magazine articles
11. Environmental/conservation groups
12. E-mail
13. Videotapes
14. Informational meetings
15. Radio news reports

We also measured respondents' attitudes, interests, and concerns about the species, using techniques developed in Loker (1995).

Survey Implementation

The self-administered, mail-back questionnaire was sent to 500 residents in each of the 3 areas (total $n=1500$) using methods outlined in Dillman (1978) and Brown et al. (1989). Response rates for the surveys regarding deer, beaver, and Canada geese were 63.1%, 54.5%, and 50.7%, respectively. Telephone interviews were conducted with non-respondents to determine whether respondents differed from non-respondents on key issues such as concerns about problems with wildlife.

RESULTS AND DISCUSSION

We found significant differences between respondents and non-respondents for variables that related to residents' concerns and experiences regarding the 3 species. The differences between respondents and non-respondents indicate that each sample may have been biased toward people who had seen or were at least aware that deer, beaver, or Canada geese existed in their area or who had formulated attitudes regarding these species. Because the goal of the sampling scheme was to select people who had experience or familiarity with the species of interest in each study area, no adjustments were made to the data. However, caution should be used when making inferences from our data to

those who have no attitude regarding the referent species.

Analysis of Measures

Information-seeking Motivation—Factor analysis revealed some similarities and differences in information motivation between respondents from Amherst, Oneonta, and Riverhead (Table 1). We found 3 information-seeking motivation factors in Amherst: *pragmatic* motivations, *nature/rights* interests, and *hunting* interests/concerns (Table 1). Factors were similar in structure for Oneonta and Riverhead, with the exception of the *hunting* factor. Trapping beaver and hunting Canada geese fell under the *pragmatic* factor for Oneonta and Riverhead, respectively. The *pragmatic* factor for each area included items related to minimizing problems caused by the referent species (e.g., information on prevention of damage, contraception, and state management programs). While some variation existed for the *nature/rights* factor, most items that comprised this factor (e.g., information regarding animal rights and viewing/photographing the referent species) were consistent for the 3 areas. For Amherst, information-seeking regarding deer hunting comprised a separate factor. Still, little variation existed among the 3 areas as far as the structure of information interest was concerned. Across the 3 areas, the 2 important factors are the *pragmatic* factor and the *nature/rights* factor, reflecting the fact that a general dichotomy in public opinion on wildlife issues tends to drive 2 different types of information-seeking behavior. We argue that wildlife professionals can rely on this dichotomy regardless of geographic area.

Relationships were examined between residents' information-seeking motivation factors and their: (1) attitudes toward the referent species, (2) interests in activities associated with the referent species, (3) concerns about problems caused by the referent species, and (4) acceptance of management actions used to minimize problems with the referent species. Residents were asked about their degree of interest in activities (e.g., watching wildlife, photography, hunting associated with species in their area). Response options ranged from "not at all interested" to "greatly interested." In addition, residents were asked to report their level of concern about various problems (e.g., vehicular accidents, property damage) regarding the referent species. Response options ranged from "not at all

concerned” to “greatly concerned.” Table 2 illustrates associations between information-seeking tendencies and these variables for the Merritt’s Pond area (similar relationships existed within each area). Riverhead residents who were interested in *pragmatic* or *hunting* information (e.g., how to prevent damage to property, health/sanitation problems) regarding Canada geese possessed more negative attitudes about geese. In addition, these residents were more concerned about nuisance, damage, and health/safety issues associated with Canada geese than residents who would not seek such information. Conversely, residents interested in information regarding viewing/photographing geese or animal rights displayed less concern about this species in their areas.

Thus, information-seeking motivation can be seen as a reliable and consistent indicator of concern about the species. The disparity between *pragmatic* information-seekers and *nature/rights* information-seekers was consistent across the 3 study areas. In general, *pragmatic* information-seekers were concerned about problems associated with the referent species, whereas *nature/rights* information seekers were interested in activities associated with the referent species, with the exception of hunting.

For the Riverhead area, significant negative correlations were found between the *pragmatic/hunting* factor and acceptance of “letting nature take its course” without human interference or feeding Canada geese, but significant positive correlations existed between the *nature/rights* factor and these management actions. Residents who were interested in practical or hunting information were more likely to accept invasive management actions than those who desired information regarding viewing/photographing geese or animal rights. These residents were more likely to accept lethal methods as practical means to solve problems caused by wildlife. As would be expected, residents interested in *nature/rights* information were less likely to accept lethal methods. Significant, negative correlations existed between information-seeking about *nature/rights* topics and acceptance of lethal methods in all 3 areas.

Sources

We were interested in the relationship between residents' information motivations and sources

they used to obtain specific information about deer, beaver, or Canada geese. Although no patterns were apparent across all 3 areas, some similarities were found. In Amherst and Riverhead, significant correlations ($p \leq 0.05$) existed between: (1) *pragmatic* information seeking and frequency of local newspaper reading, and (2) *nature/rights* information seeking and frequency of magazine reading. For Amherst and Oneonta, significant correlations existed between *pragmatic* information-seeking and attention to New York State DEC publications. No similarities existed between Oneonta and Riverhead. Thus, residents of the 3 areas were similar in terms of some, but not all, of their information-seeking motivations. This may be due partially to the fact that respondents cannot reliably remember or estimate where they get species-specific information. If such is the case, then more general media use must be scrutinized to help the planner. That is, in cases such as this where sources of species-specific information are not very predictive, then planners still can turn to information about general media use because that will be better than having *no* information.

Media Use

In addition to understanding people’s desire for specific types of information and specific sources that have been used to obtain information about a species, we were interested in people’s general media usage. This information facilitates communication with the public by identifying appropriate sources and channels through which they may be reached.

First, the communication planner must describe the media market within which he/she is working. We found significant differences among the 3 areas for 2 media-use variables, local television news watching and daily newspaper reading. On average, Amherst residents used local television news (Amherst [A]=4.56 hours/day, Oneonta [O]=2.85, Riverhead [RH]=3.69; $p < 0.05$) and the local daily newspaper (A=5.91 days/week, O=4.88, RH=3.86; $p < 0.05$) more often. News use normally is correlated positively with socioeconomic status, income, and education, so these differences probably reflect demographic variation across the sample sites. Significant differences ($p < 0.05$) existed between Amherst and Riverhead for the mean number of hours of general television viewing per day (A=2.60, RH=3.17) and the number of wildlife/nature

magazines read per month (A=0.60, RH=1.03). In addition, significant differences were found between Amherst and Oneonta for the mean number of hunting magazines read per month (A=0.15, O=0.91) and the number of video cassettes watched per week (A=0.78, O=1.18). These findings reflect differences specific to the characteristics of the 2 media markets: Oneonta significantly is more rural than Amherst.

We found 4 primary media-use factors for each area (Table 3). Only 1 factor remained constant (i.e., was comprised of the same items) for each of the areas. This factor, which was labeled *environmental/wildlife media*, included the use of wildlife, nature, and animal rights magazines. Hunting magazines were included in this factor for Amherst and Oneonta, but factored alone for Riverhead. Other media fell under different factors for each area and reflects underlying differences in media use (and in the nature of the media markets) among the areas.

Correlation analysis revealed relationships between information-seeking motivation factors and media-use factors (Tables 4-6). For each of the 3 areas, significant associations were apparent between *nature/rights* information-seeking and *environmental/wildlife* media use. In Amherst, deer *hunting* information-seeking also correlated significantly with *environmental/wildlife* media use. Significant correlations also were found between the *nature/rights* and *hunting* information-seeking factors and *entertainment/misc.* (e.g., video tapes) media use. For Amherst, *pragmatic* information-seeking was related to use of mainstream news. However, in Oneonta, *pragmatic* information-seeking was related negatively to general TV/local news watching. No significant relationship existed between *pragmatic* information-seeking and any of the media use factors for Riverhead.

Thus, it is difficult to generalize across markets about media usage of particular types of information seekers. This may arise because media markets (particularly those in this study) differ across many characteristics (and each study addresses different species, thus information-seeking characteristics logically will differ). Larger media markets (e.g., Amherst) offer options that differ from those in smaller cities (e.g., Oneonta), whereas markets near large cities (e.g., Riverhead) have still more options. This

suggests that studies of media use should be conducted on an area-by-area basis to maximize reliability of results and efficiency and effectiveness of information dissemination.

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

It is difficult to generalize across differing media markets because the problems experienced and the species involved differ in each area.

However, some conclusions can be reached. In Amherst, for instance, on the issue of deer, both of the major information-seeking types use environmental/wildlife sources. This presents both an opportunity and a problem. The opportunity is that typically “opposing” groups can be reached in the same medium. Thus, an agency could opt to concentrate its communication in this medium to put both groups on the same playing field and to maximize its investment of resources. However, the problem is that opposing groups often interpret messages differently. Thus, the agency may wish to keep especially controversial news items out of such media, where the opportunity for polarization especially is prominent.

- *Recommendation: over the long term, place stories on cooperation between nature/rights and pragmatic types in environmental/wildlife publications. Avoid controversial issues in these publications, if possible.*

In Riverhead, the data show that those interested in aesthetic/animal rights issues are, in general, much heavier consumers of the local newspaper. The agency professional in this area therefore needs to pay special attention to the role this paper plays. He/she must determine whether the newspaper leans toward the aesthetic/rights viewpoint (which is possible given the high correlation), or whether the newspaper simply incites attention through controversial coverage. The local newspaper likely played a primary role in constructing public attention on the goose controversy. Further research (content analysis, for instance) could show the nature of this construction. In any case, the agency communication planner should develop close professional relationships with this medium, given its self-evident importance.

- *Recommendation: develop a strong working relationship with local*

newspaper personnel to help educate writers and editors on goose management issues. Try to present alternatives to highly inflammatory or controversial coverage.

Further, Riverhead residents who had concerns or negative attitudes about Canada geese were more interested in pragmatic or economic information regarding Canada geese than were residents who were interested in or had positive attitudes about geese (as would be expected). Loker (1995) found that interests in and concerns about deer, beaver, and Canada geese by suburban residents influenced their attitudes toward these species. Concerns and negative attitudes toward Canada geese may have motivated pragmatic information-seeking in some residents (i.e., pragmatically-oriented Riverhead residents “gratify” their need for information by using news media).

- *Recommendation: communication that intends to minimize concern should be directed toward residents with pragmatic information needs whereas communication that intends to increase interest in a particular species should be directed toward nature/rights information seekers. Both types of communication may produce more positive attitudes toward a problem species and increase agency responsiveness to public information needs.*

In Oneonta, where a particular species has not yet caused many problems but may in the future, residents may not be motivated to seek any information about that species. If the species becomes recognized as an issue in a community through the media or other communication sources, residents will begin to form attitudes about it and thus be more likely to seek information or at least form an opinion based on information provided to them. It may behoove wildlife agencies to implement proactive communication (e.g., build relationships with the media, community leaders) in these areas and allow residents to build trust in wildlife agency staff as an information source. The agency should embrace such opportunities to develop successful mass communication strategies before an urgent need to do so is thrust upon them.

- *Recommendation: a planned and periodic release of information to the various media that highlights positive aspects of beaver management could cultivate wider public acceptance of more invasive techniques when or if the need arises.*

Those interested in pragmatic information also tend to support “traditional” management options more frequently. Moreover, in 2 of the 3 study areas, these groups rely on newspapers for their data on wildlife issues. Nature/rights supporters, conversely, use magazines, specialized publications, and entertainment sources more frequently. Magazines often present information in narrative-structured packages, whereas newspapers focus more on providing information. This suggests that pragmatic information-seekers may be “informed” about wildlife issues, whereas nature/rights information seekers are motivated by stories, narratives, and images about wildlife problems. Wildlife managers should interpret these as evidence of the gratifications different audiences seek in their use of media resources.

Here, specific recommendations depend on the goals developed in a communication plan. If the agency has the goal of reconciling conflict between opposed groups, then messages need to be targeted at the types of media those groups use most frequently, and in a format they are accustomed to using. Thus, pragmatic information-seekers will be influenced more by messages targeted at informational media that present factual reasons for reconciling positions with nature-rights supporters. Conversely, nature/rights supporters will be motivated more by narratives that show how cooperation leads to better outcomes for wildlife. These narratives should be targeted at magazines preferred by this audience.

On the other hand, the agency’s goal may be to strengthen a specific audience. Such a strategy tends toward manipulation and probably would not be adopted by most agencies today, but could be legitimate if the agency decided that a particular course of action substantively was better for wildlife. In that case, the agency should address communication unilaterally to the public to be supported, and in the specific media used most frequently by that public. In Amherst,

for instance, a strategy that supported the pragmatic group ought to focus on the “mainstream” news media preferred by that group. A strategy for strengthening the nature/rights group should focus on environmental media.

Although similarities in residents' information-seeking motivations do exist for the 3 areas, their use of the general media differed. The *environmental/wildlife* factor was the only consistent media use factor throughout the 3 areas. Variability in media use between Amherst, Oneonta, and Riverhead reflects differences in demographic characteristics (e.g., age, education) and the relative proximity of each to a major metropolitan area. Thus, general assumptions about media use should be made cautiously for suburban areas, which can differ widely in demographic makeup. It cannot be assumed that people with similar information needs regarding wildlife will use the same sources and channels to gain that information. For example, it was difficult to discern a general media-use pattern for *pragmatic* information-seekers in each area. Effective communication on problem-causing species therefore requires, at a minimum, routine monitoring of information about local media use.

- *Recommendation: examine media use patterns of wildlife publics every 3 years to monitor and detect changes in the media and opinion landscape.*

Effective communication begins by recognizing audiences as active participants in the communication process. The “uses and gratifications” approach emphasizes the information-seeking motivations and media use of the public and therefore may be a helpful tool for wildlife agencies interested in meeting public needs regarding problem-causing wildlife. Agencies that move toward a more tailored, audience-oriented approach to communication will build better relationships and minimize contention between themselves and their publics.

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Table 1. Factor solutions for: types of information that residents would seek regarding the referent species in Amherst, Oneonta and Riverhead.		
AMHERST (deer):	ONEONTA (beaver):	M. POND (geese):
<i>Pragmatic</i>	<i>Pragmatic</i>	<i>Pragmatic/hunting</i>
Prevention of deer-car accidents Prevention of deer damage to property Deer contraception State deer management programs	Prevention of damage to trees Prevention of damage to land Beaver trapping Beaver contraception State beaver management programs	Goose biology and habitat Prevention of damage to property Health/sanitation problems caused by geese Goose hunting Goose contraception State goose management programs
<i>Nature/rights</i>	<i>Nature/rights</i>	<i>Nature/rights</i>
Deer biology/habitat Viewing/photographing deer Animal rights	Beaver biology/habitat Viewing/photographing beaver Animal rights	Viewing/photographing geese Animal rights
<i>Hunting</i>		
Deer hunting		

Table 2. Relationships between information seeking motivation and concerns, attitudes and views about management actions		
Variable	Factors	
	<i>Pragmatic</i>	<i>Nature/rights</i>
Attitude toward Canada geese¹	-0.31*	0.30*
Interests:² Watching Canada geese near home	-0.03	0.47*
Photographing Canada geese	0.00	0.49*
Hunting Canada geese	0.25*	0.02
Feeding Canada geese near Merritts Pond	-0.14	0.38*
Seeing Canada geese near your home	-0.09	0.34*
Hearing the sounds Canada geese make as they fly overhead	-0.08	0.32*
Concerns:³ Canada geese disturbing you with their calls	0.15*	-0.15*
Canada goose droppings in parks	0.33*	-0.28*
Canada goose droppings on your lawn or other property	0.33*	-0.21*
Losing control of your vehicle when trying to miss Canada geese on the road	0.13	-0.14
Health and sanitation problems caused by Canada goose droppings	0.39*	-0.21*
Canada geese chasing or threatening you	0.07	-0.17*
Canada geese polluting Merritts Pond with their droppings	0.42*	-0.19*
Concerns: Damage to lawns from Canada geese	0.45*	-0.18*

Variable	Factors	
	<i>Pragmatic</i>	<i>Nature/rights</i>
Canada goose droppings on golf courses	0.29*	-0.14
Management Actions: ⁴ Scarecrows to keep Canada geese away from property	-0.13	0.00
Birth control/sterilization	0.32*	-0.08
Feed Canada geese during the winter	-0.38*	0.22*
Non-harmful chemical repellents	0.29*	-0.18*
Trap and transfer Canada geese to another location	0.22*	-0.24*
Sharpshooters to shoot Canada geese and give meat to food banks	0.27*	-0.24*
Treat some Canada goose eggs so they do not hatch	0.28*	-0.29*
Regulated hunting by licensed hunters	0.24*	-0.21*
Reintroduce natural predators of Canada geese	0.24*	-0.20*
Remove Canada goose eggs from nests and destroy them	0.25*	-0.28*
Trap Canada geese and kill them with lethal injections	0.16*	-0.16*
Let nature take its course	-0.46*	0.29*
Use balloons or flags on floating boards to keep Canada geese away from Merritts Pond	0.07	-0.20*
Management Actions: Prohibit people from feeding Canada geese	0.26*	-0.14
Dogs to scare Canada geese away from property	0.07	-0.13

Variable	Factors	
	<i>Pragmatic</i>	<i>Nature/rights</i>
Fences or other barriers to keep Canada geese away from Merritts Pond	0.05	-0.19*
<p>*Correlation is significant at $p \leq 0.05$.</p> <p>¹Response options were 1=do not enjoy Canada geese and regard them as nuisances; 2=enjoy presence of Canada geese but worry about problems they cause; 3=enjoy presence of Canada geese unequivocally.</p> <p>²Response options ranged from 1=not at all interested to 5=greatly interested.</p> <p>³Response options ranged from 1=not at all concerned to 5=greatly concerned.</p> <p>⁴Response options ranged from 1=not at all acceptable to 4=very acceptable.</p>		

Table 3. Media-use factors.

AMHERST:

- Environmental/wildlife:* Use of media that focus specifically on environmental issues such as nature or wildlife (e.g., wildlife or hunting magazines).
- Local newspapers:* Use of daily and/or local newspapers (e.g., *Amherst Bee*).
- News magazines:* Use of national news magazines.
- Entertainment:* Use of entertainment media (e.g., video cassettes).

ONEONTA:

- Environmental/wildlife:* Use of media that focus specifically on environmental issues such as nature or wildlife (e.g., wildlife or hunting magazines).
- Television:* Use of television generally and television news programs.
- Written news media:* Use of written news media (e.g., local news papers, national news magazines).
- Miscellaneous:* No logical pattern existed within this factor.

RIVERHEAD:

- Environmental/wildlife:* Use of media that focus specifically on environmental issues such as nature or wildlife (e.g., wildlife or hunting magazines).
- Local newspapers:* Use of daily and/or local newspapers (e.g., *Newsday*).
- Random new media:* Use of a variety of sources of news media (e.g., radio news programs, television, news).
- Hunting magazines:* Use of hunting magazines.

Table 4. Correlations between media use and information-seeking motivation factor scores for Amherst.				
Information Motivation Factors	Media Use Factors			
	<i>Envir./wildlife</i>	<i>Mainstream news</i>	<i>News magazines.</i>	<i>Entertain./misc.</i>
<i>Pragmatic</i>	0.08	0.16*	-0.05	-0.08
<i>Nature/rights</i>	0.41*	-0.03	0.06	0.17*
<i>Hunting</i>	0.22*	-0.02	-0.03	0.13*
*Correlation significant at $p < 0.05$.				

Table 5. Correlations between media use and information-seeking motivation factor scores for Oneonta.				
Information Motivation Factors	Media Use Factors			
	<i>Envir./wild-life</i>	<i>Television</i>	<i>Written news media</i>	<i>Misc.</i>
<i>Pragmatic</i>	0.05	-0.18*	-0.01	0.02
<i>Nature/rights</i>	0.21*	-0.05	-0.01	0.10
*Correlation significant at $p < 0.05$.				

Table 6. Correlations between media use and information-seeking motivation factor scores for Riverhead.				
Information Motivation Factors	Media Use Factors			
	<i>Envir./wild-life</i>	<i>Local newspaper</i>	<i>Random</i>	<i>Hunting mags.</i>
<i>Pragmatic/sci./hunting</i>	0.12	0.13	-0.04	0.01
<i>Aesthetic/rights</i>	0.02	0.39*	-0.06	0.05
*Correlation significant at $p < 0.05$.				