

**Wildlife Attitudes and Values:
A Trend Analysis**

by

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EXECUTIVE SUMMARY

Introduction

Members of Cornell's Human Dimensions Research Unit (HDRU) have observed growing interest over the last two decades in how human dimensions of wildlife management constrains or enables management. One question frequently asked is how have attitudes and values of the general population toward wildlife changed in recent years? Many people involved in wildlife management believe that attitudes toward wildlife have recently become more protectionist, or less utilitarian. However, very few researchers have had the opportunity to study these kinds of trends with time series or trend data.

The HDRU has archived data from studies that contain a standard scale to measure wildlife attitudes and values since 1984. The Wildlife Attitudes and Values Scale (WAVS) was developed by members of the HDRU in cooperation with DEC staff. This scale has been included in the questionnaires of 17 studies conducted during the period from 1984-1996. This body of research includes responses from nearly 10,000 stakeholders in New York State and were used to examine changes in wildlife attitudes and values.

Study Purpose and Objectives

Our study was designed to examine the hypothesis that citizens of New York have become more protectionist in their attitudes about acceptable interactions of humans with wildlife. The objectives of this research are to: (1) identify trends in wildlife attitudes and values held by New York State residents; and (2) describe differences in attitudes due to a variety of variables that have been important in both past and present research including age, gender, stakeholder group (hunter, landowner, general outdoor recreationist), and non-rural residence.

Procedures

Only studies conducted by the HDRU that included WAVS items were included in the multivariate trend analysis. In total, 17 studies were analyzed, with 3 studies conducted in 1984, 6 in 1985, 1 in 1987, 2 in 1988, 2 in 1990, and 3 in 1996. The overall sample was composed of 9,847 residents living in New York State. We used 7,589 observations in the final analysis because of incomplete information provided by some respondents.

The data are not longitudinal; that is, each study deals with a separate sample of different individuals. Differences identified over time are trends changes in population characteristics, not changes for individuals (i.e., this is not a panel study). In this report, significance should mainly be attributed to consistent evidence of relative changes in the direction in trends, not absolute levels or fine changes from year to year.

The WAVS scale used in the analysis included 16 statements about wildlife to which respondents indicated their agreement or disagreement that each item is personally important. The scale used typically ranged from (5) "strongly agree" to (1) "strongly disagree." Previous research found that WAVS items tend to break down broadly into four ways of thinking about wildlife. This outcome was supported in the overall dataset by a principal components factor analysis with varimax rotation. The social benefits dimension contains items about the appreciation and existence of wildlife. The communication benefits dimension includes items about observing and talking about wildlife. The problem tolerance dimension includes items concerning economic and health safety risks. Finally, the traditional conservation dimension includes items involving management for sustainable use and consumptive uses.

Summary of Results and Recommendations

In New York State evidence of several trends exists that may make managers and researchers re-evaluate the common belief that attitudes toward wildlife have become more protectionist and less utilitarian.

The study found evidence of declining problem tolerance regardless of stakeholder group. That is, most citizens seem less tolerant of the typical problems associated with wildlife. The decline in problem tolerance is present for residents living both in rural and non-rural areas.

While women have not changed attitudes and values toward traditional conservation in any significant way, there is growth in agreement with traditional conservation values among men.

People think that communication benefits are personally important. However, the gulf is widening between rural and non-rural residents concerning communication benefits. Specifically, among people living in non-rural areas, over time, fewer report that communication about wildlife is personally important.

There are no significant trends in New York State residents attitudes and values regarding social benefits of wildlife.

Although our findings do not conclusively show that non-extractive or protectionist values are declining significantly in New York, we certainly have no evidence that these values have gained adherents, which has been commonly assumed within the wildlife management profession. Changes in demographic patterns, wildlife population growth, increase in nontraditional and non-consumptive wildlife use, and wildlife-people problems are just some of the reasons that peoples attitudes toward wildlife may be changing.

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INTRODUCTION

National, state, and local wildlife management policies are to varying degrees founded on the attitudes and values about wildlife in society. This grounding of wildlife policy in social values can be seen in the processes establishing such policy and in the long list of governmental policies that require an analysis of social values as an element of the decision making process, including the Endangered Species Preservation Act of 1966, the National Environmental Policy Act of 1969, The Forests Acts of 1974 & 1976, and the Fish and Wildlife Conservation Act of 1980 (Steinhoff, Walsh, Peterle, & Petulla, 1987). The role of the wildlife manager is that of a steward of public resources, which involves a never-ending process of evaluating the public's needs, uses, and attitudes regarding wildlife (Witter & Sheriff, 1987, p. 262).

One important question that researchers and governmental agency personnel continually seek to answer is: What are the attitudes and values of stakeholders concerning wildlife? One of the most extensive examinations of the trends in wildlife attitudes was undertaken by Kellert and Westervelt (1983) in phase IV of a multi-phase research project for the US Fish and Wildlife Service. Citing the difficulty in using historical evaluations as an indication of the public's attitude toward wildlife, they used newspaper articles as a means of examining trends. This medium contains continuous coverage of animal related issues and topics. In addition, it provides localized coverage that allows for the examination of regional and demographic differences while presenting the concerns and perceptions of the general public (Kellert & Westervelt, 1983).

Thirty-one years of newspaper coverage were sampled by Kellert and Westervelt from the time period of 1900 through 1975, with a total of 4,873 coded articles. Based on

nine basic wildlife attitude groupings (Kellert, 1976), the study found that the "utilitarian" attitude was most common, present in 48% of the newspaper articles. The "humanistic" attitude (interest and affection for individual animals) and the "neutral" attitude (avoidance of animals due to indifference) were the second and third most common attitudes presented in the coded articles. In addition, the study found that although the utilitarian attitude remained prevalent, it declined in pervasiveness toward the later years of the sample. This study did not actually track public attitudes, as we do in this study, but conclusions about public feeling were at least implied.

In a more contemporary article, Manfredo, Decker, and Duda (1998) speculate that public attitudes toward wildlife may have recently become more protectionist less utilitarian. Changes in demographic patterns, wildlife population growth, increase in nontraditional and non-consumptive wildlife use, and wildlife-people problems are just some of the reasons its possible that peoples attitudes are changing toward wildlife. However, very few researchers have had the opportunity to document these kinds of trends, especially with longitudinal or trend datasets.

Wildlife Attitudes and Values Scale

An area of research focus at the Human Dimensions Research Unit (Department of Natural Resources at Cornell University), which often cooperates with New York States Department of Environmental Conservation, is wildlife attitudes and values. This interest, and the overall development of the research field known as human dimensions of wildlife, led to the development of WAVS (Purdy & Decker, 1989b), patterned in concept after Kings (1947) classification of wildlife values. According to Purdy and Decker (1989b, pp.2-3) WAVS was developed:

For purposes of obtaining information about the social values of wildlife for management decisions in New York. Our goal has been to develop a standardized measure that could be incorporated easily into multi-purpose questionnaires, be useful across a variety of wildlife management issues and related audiences, and that would, with acceptable accuracy and reliability, provide an indicator of the values orientation of a constituency or subgroup thereof towards wildlife.

The scale has been used many times in a variety of research contexts. Although the scale can focus on attitudes of the general public, as Kellert and colleagues or as Manfredo and others have, much of the WAVS research examined the attitudes and values of specific stakeholder groups including hunters, outdoor recreationists, rural landowners, suburban homeowners, wildlife agency personnel, and graduates of hunter training courses. This research has been used to understand these groups attitudes toward wildlife and their management (Purdy & Decker, 1989b). The scale has been included in over 17 studies conducted by the HDRU during the period of 1984 to 1996. The original intent behind the development of this scale was to have a measure that could be included in several studies, thereby allowing for a trend analysis of attitudes and values. Attitude statements were developed from both wildlife literature and HDRU staff input (Purdy & Decker, 1989a) and were subject to extensive pre-testing before the scale was finalized. This pre-testing included open-ended interviews and expert review, which led to the development of a list of 25 attitude statements (Decker, Brown, & Hustin, 1981). A further step in the refinement process involved the inclusion of WAVS in several studies from 1981 through 1983 (Decker et al., 1981; Connelly, Brown, & Decker, 1984; Smolka, Decker & Brown, 1984) before the scale was finalized (Purdy & Decker, 1989a, 1989b).

Research Questions

Responses of New York State residents to the WAVS items will be used to answer the following questions:

1. What are the trends in wildlife attitudes and values held by New York State residents?
2. Are differences in attitudes due to a variety of variables that have been important in both past and present research, including age, gender, stakeholder group (hunter, landowner, general outdoor recreationist) and rural/non-rural residence?

Research Design

To examine changes in New York State residents attitudes and values, data were drawn from 17 separate studies over the years of 1984 through 1996. Each study had a unique purpose and respondents represented a variety of stakeholders, including hunters, residents of rural and non-rural areas, and recreationists. The analysis relies on multivariate trend analysis, a technique also known as multi-level analysis, hierarchical analysis, and mixed model analysis, to account for all sources of variability. This research explains outcomes based on fixed factors and random factors (Arnold, 1992; Littell, Milliken, Stroup, & Wolfinger, 1996). For this study, multivariate trend analysis accounts for individual level differences (random factors such as age, gender, stakeholder group, and urban/rural residence), as well as survey level differences (this is a fixed factor, because each survey differs from the others in certain fixed, nonrandom ways). Results are given as statistically controlled averages for each year. The analyses are idealized trends extrapolated from raw data and results must be interpreted in terms of the average or typical person for the entire sample, rather than the typical person for each individual study. In addition, the data are not longitudinal; that is, each study deals with

a separate sample of different individuals. Differences identified over time are trends - changes in population characteristics, not changes for individuals (i.e., this is not a panel study). The benefits of being able to extrapolate trends supercede any limitations of the statistical analysis. In summary, then, though the data present an idealized picture based on certain assumptions, they can be used to identify trends.

Study Selection

For the purposes of the trend analysis, only studies conducted by the HDRU that included WAVS items were included. Seventeen studies were in the analysis, with 3 studies conducted in 1984, 6 in 1985, 1 in 1987, 2 in 1988, 2 in 1990, and 3 in 1996. Though geographically limited to New York State, this certainly comprises one of the more complete and consistent collections of data on wildlife attitudes and values in existence. For each study, geographic focus, description of respondents, and sample size is included in Table 1.

Table 1. Sample of Studies Included in the Multivariate Trend Analysis

Year	Geographic Focus of Study	Description	N
1984	Northern, NY	Wildlife Organization Representatives	277
	Statewide	Wildlife Hunters	2,752
	Statewide	Wildlife Hunters	433
1985	Central, NY	Wildlife Hunters	423
	Central, NY	Rural Landowners	126
	Islip, NY	Wildlife Organization Representatives	288
	Northern, NY	Homeowners	219
	Northern, NY	Rural Landowners	1,011
	Western, NY	Recreationists	519
1987	Westchester County	Rural Landowners	663
1988	Statewide	Homeowners	1,209
	Tompkins County	Wildlife Hunters	357
1990	Orange County	Residents	182
	Putnam County	Residents	175
1996	Albany, NY	Residents	359
1996	Corning, NY	Landowners	413
1996	Wellsville, NY	Landowners	441

The sample

The overall sample was composed of 9,847 residents living in New York State. We used 7,589 observations in the analysis because of incomplete information provided by some respondents (Table 2). Two-thirds of the sample was male (67%, n = 6,618) and one third of the sample was female (33%, n = 2,426). The majority of respondents (67%, n = 5,920) reported that they live in an urban or suburban area. Forty-three percent of respondents were landowners (n = 4,043), 47% were hunters (n = 4,394), and 10% were wildlife recreationists (n = 1,011). Respondents were categorized into three age groups. Approximately one-third were 25 years of age or younger (n = 3,083), one-third were 26 years old to 45 years of age (n = 3,143), and one-third of respondents were 46 years of age or older (n = 3,058). The average age for the entire sample of respondents was 37.9 years.

Table 2. The Nature of the Sample

Demographics	N
Men	6,618
Women	2,426
Rural	2,938
Non Rural	5,920
Landowner	4,043
Wildlife Recreationists	1,011
Users	4,394
Hunter	
<= 25 Years of Age	3,083
26-45 Years of Age	3,143
>= 46 Years of Age	3,058

Wildlife Attitudes and Values

Although the introductory sentence may differ in some surveys, the Wildlife Attitude and Values Scale asks respondents how strongly they agree or disagree with attitudinal statements based on the personal importance of each item. A 5-point Likert scale is used, allowing respondents to indicate: strong disagreement (coded 1), disagreement (2), neutrality / not sure (3), agreement (4), or strong agreement (5).

Previous analysis of the scale in several studies revealed that these items tend to coalesce into four ways of thinking about wildlife. This finding was supported in our analysis of the overall dataset by a principal components factor analysis with varimax rotation (see Table 3).

Social Benefits

The first dimension identifies a social benefits theme (the factor has an eigenvalue of 5.68 and accounted for 35.5% of the common variance). This dimension contains items about appreciating and valuing the existence of wildlife, characterized by responses with regard to the following statements: (1) It is important that people consider the presence of wildlife as a sign of the quality of the natural environment [quality of environment]; (2) It is important that people know that wildlife exist in nature [existence]; (3) It is important that people appreciate the role that wildlife play in the natural environment [ecological role]; (4) It is important that wildlife are included in educational materials as the subject for learning more about nature [learning subject]; and (5) It is important that people understand more about the behavior of wildlife [behavior].

Traditional Conservation

The traditional conservation dimension (eigenvalue = 2.28, 14.3% of the common variance) is characterized by responses to items involving management for sustainable use: (1) It is important that people trap furbearing animals for the sale of furs or pelts [trap]; (2) It is important that people hunt game animals for recreation [extractive]; (3) It is important that people hunt game animals for food [hunt for food]; (4) It is important that local economies benefit from the sale of equipment, supplies, or services related to wildlife recreation [economic benefit]; and, (5) It is important that game animals are managed for an annual harvest for human use without harming the future of the wildlife population [renewable resource].

Communication Benefits

The communication benefits theme (factor 3) had an eigenvalue of 1.12 and accounted for 7% of the common variance. This dimension includes items about observing and talking about wildlife: (1) It is important that people talk about wildlife with family and friends [vicarious value]; (2) It is important that people observe or photograph wildlife [nonextractive]; (3) It is important that people see wildlife in books, movies, paintings, or photographs [art]; and, (4) It is important that people express opinions about wildlife and their management to public officials or to officers of private conservation organizations [express opinion].

Problem Tolerance

The problem tolerance theme (factor 4) had an eigenvalue of 1.04 and accounted for 6.5% of the common variance. This dimension includes items concerning safety risks: (1) it is important that people tolerate most wildlife nuisance problems

[nuisance]; (2) it is important that people tolerate the ordinary risk of wildlife transmitting disease to humans or domestic animals; (3) it is important that people tolerate most levels of property damage by wildlife; and, (4) it is important that people tolerate the ordinary personal safety hazards associated with some wildlife [tolerate hazard]. Due to several instances where items (2) and (3) were not asked of respondents in some surveys, they were not included in the final factor analysis (see Appendix A for entire question format).

Table 3. Factor Analysis of WAVS Items

	Social Benefit	Traditional Conservation	Communication Benefits	Problem Tolerance
Quality of the Environment	.77	.03	.25	.12
Existence	.76	-.00	.19	.12
Ecological Role	.84	.03	.27	.11
Learning Subject	.81	.02	.29	.04
Behavior	.64	.17	.40	.20
Trap	-.17	.65	.15	.04
Extractive	-.06	.79	.05	.14
Hunt for Food	.03	.79	.11	.12
Economic Benefit	.21	.54	.12	-.02
Renewable Resource	.53	.60	-.09	.04
Vicarious Value	.25	.18	.76	.08
Nonextractive	.39	.04	.67	.08
Art	.44	-.00	.58	.00
Express Opinion	.13	.22	.67	.15
Nuisance	.06	.08	.14	.88
Tolerate Hazard	.34	.17	.12	.75

The original pre-test of WAVS items during the period of 1981-1983 indicated that there were three WAVS dimensions: traditional conservation, societal-benefits, and problem-acceptance attitudes (Connelly et al., 1984; Smolka et al., 1984; Decker et al., 1981). The societal-benefits value orientation identified in the earlier studies included the communication benefits and the societal benefits items we found to be separate dimensions of the scale. Since the 1985 study of wildlife attitudes and values in Westchester, New York, factor analysis of WAVS items indicates that there are four attitudinal dimensions that reflect New York State residents wildlife attitude and value orientations (Connelly et al., 1987). This study is in keeping with the latter findings, which distinguishes between societal and communication benefits.

Results

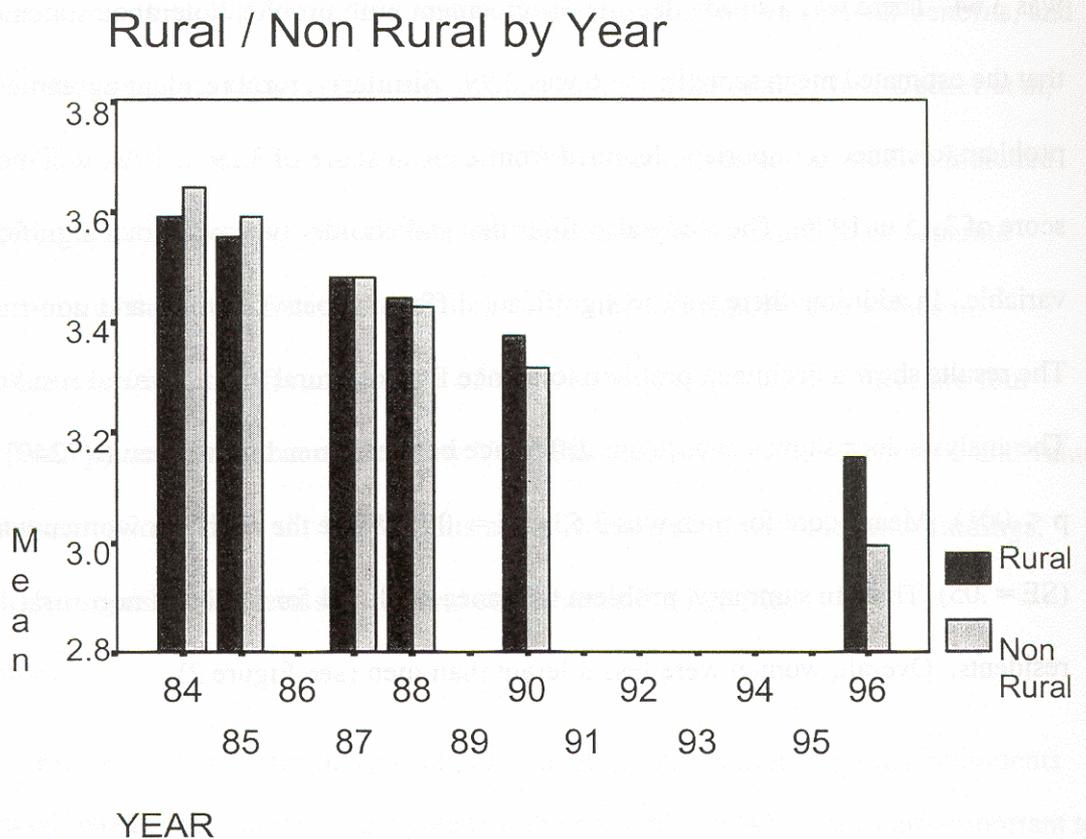
Findings of the trend analysis are presented in this section. Again, respondents are asked whether they agree or disagree that the particular WAVS items are important to them personally. In the analysis, significance should mainly be attributed to consistent evidence of relative changes in direction in trends. Also, there are some years that we do not have a study, so the analysis includes interpolation of missing data. Thus, the estimates are relative and not absolute.

The multivariate trend analysis revealed significant changes in New York State residents attitudes and values along the problem tolerance dimension, the traditional conservation theme, and the communication dimension. No significant change was detected in attitudes and values concerning the social benefit of wildlife from 1984 through 1996.

The analysis found a significant interaction effect between year and rural/non rural domicile ($t[7240] = 2.56, p < .02$) for the problem tolerance theme (Figure 1). The

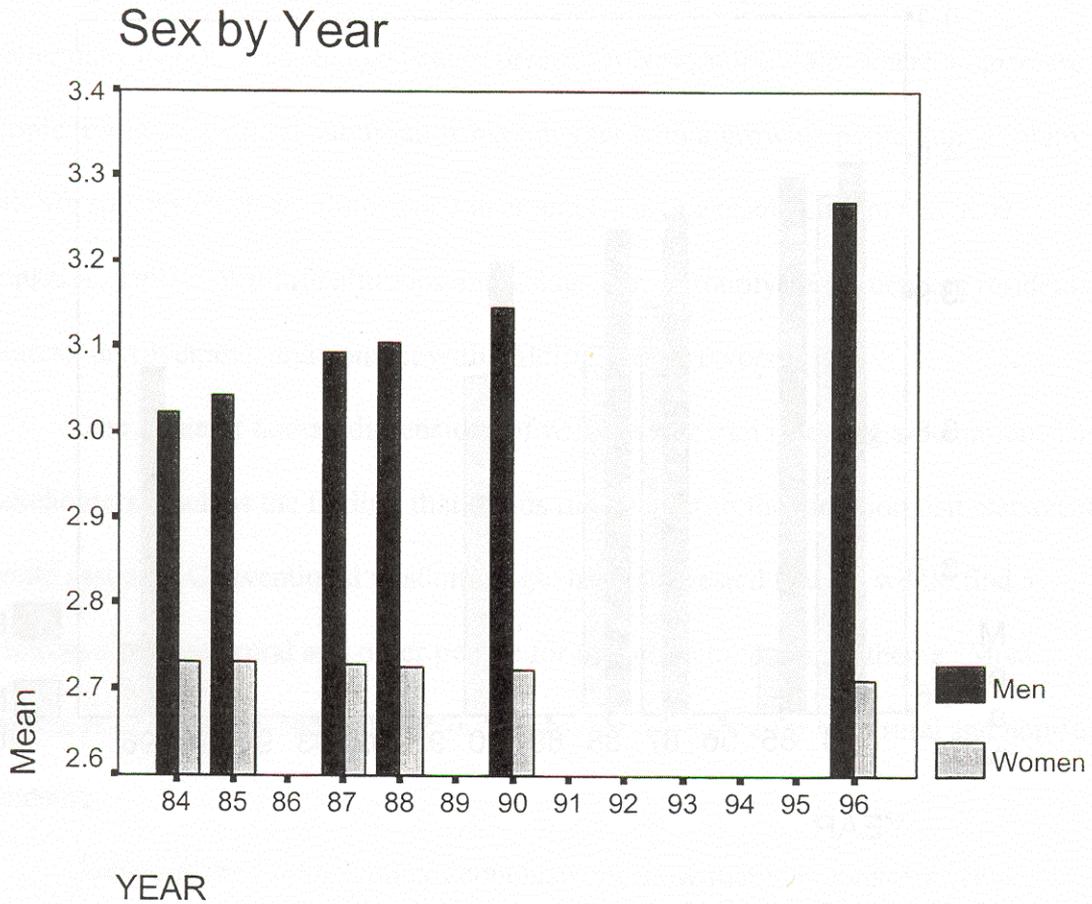
estimated mean score for problem tolerance for the average non-rural resident in 1984 was 3.64. There was a steady decline in agreement with problem tolerance statements so that the estimated mean score in 1996 was 2.99. Similarly, rural resident agreement that problem tolerance is important declined from a mean score of 3.59 in 1984 to a mean score of 3.15 in 1996. The study also finds that stakeholder type was not a significant variable. In addition, there was no significant difference between rural and non-rural. The results show a decline in problem tolerance for both rural and non-rural residents. The analysis does show a significant difference between men and women ($t[7240] = 4.08$, $p < .001$). Mean score for men was 3.53 (SE = .05), while the score for women was 3.42 (SE = .05). Thus, in summary, problem tolerance declined for rural and non-rural residents. Overall, women were less tolerant than men (see Figure 2).

Figure 1. Declines in Problem Tolerance among Rural and Non-rural Residents



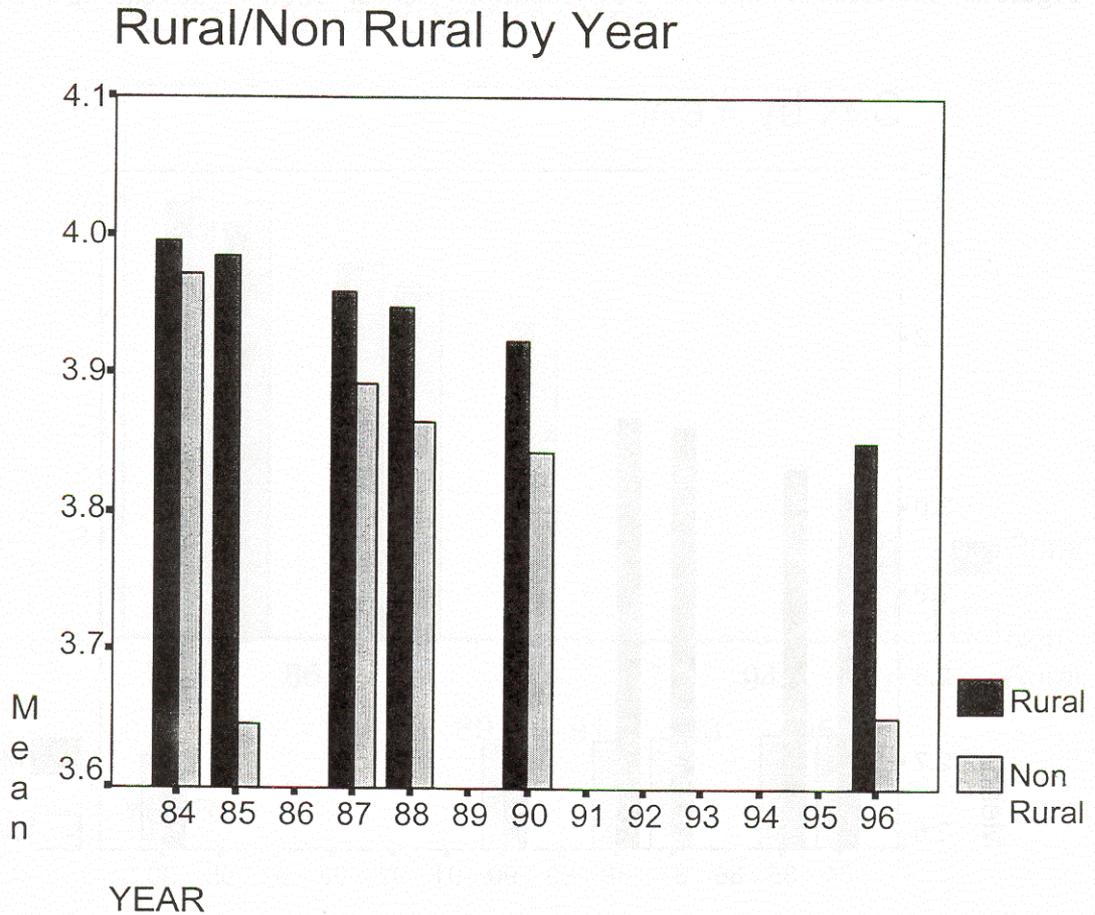
The analysis of trends in traditional conservation attitudes and values finds that women have not changed attitudes and values in any significant way from 1984 through 1996. But the results indicate significant growth in agreement ($t[7573] = -.72, p < .001$) that traditional conservation is important for men over time. The size of change is not large, but likely counter to the direction that might be expected. That is, men seem to be agreeing more with traditional conservation practices, even though other authors have argued that they are declining. In addition, the study finds that there is a significant difference between rural ($M = 3.0, SE = .13$) and non rural residents ($M = 2.7, SE = .12$).

Figure 2. Increases in Importance of Traditional Conservation Values among Men



The analysis indicates growing division between rural and non-rural residents concerning their agreement that communication about wildlife is important ($t[7577] = 2.66, p < .001$). However, moderate endorsement of communication benefits was evident throughout the period. Rural residents' agreement declined from 4.00 in 1984 to 3.85 in 1996. Non-rural residents' agreement declined from 3.97 in 1984 to 3.65 in 1996.

Figure 3. Trends in the Importance of Communication about Wildlife



Discussion and Recommendations

Wildlife managers and researchers assessing public attitudes and interests point to changes in citizen involvement in wildlife management in recent years. It is evident that not only is public interest and participation on the rise (Lyons, 1987), but that there are many new players involved – all with differing needs and views. In addition, there are several changes affecting wildlife management.

For example, it has been reported that the number of hunters is on the decline in New York (Decker, Enck, & Brown, 1993). In some areas, cohabitation of people and wildlife is a major concern for managers and residents (Bryant, 1990; Faber, 1988; Kellerman, 1997). This change is ever present in New York State, where an increase in people living in the rural/suburban fringe interact with a growing population of many wildlife species (such as white-tailed deer and Canada geese) (Litwin, Gavin, & Capkanis, 1987). Wildlife attitudes and values may certainly be influencing residents interest, involvement, and contact with wildlife and vice versa.

One value of human dimensions of wildlife research is testing assumptions about stakeholders, such as the finding that trends run counter to the direction that managers would assume. Conventional wisdom might have suggested that we would find a difference between rural and other people for the problem tolerance theme. Most importantly, this study shows a *decline* in problem tolerance for both rural and non-rural residents.

Although the findings do not conclusively show that non-consumptive or protectionist values are declining, they do suggest that the often-assumed growth of this assumption could be questioned. Agency personnel should question the common assumption that publics are becoming more protective. Human dimensions researchers may look to a variety of reasons for changing attitudes toward wildlife, including changes in demographic patterns, wildlife population growth, increase in nontraditional and non-consumptive wildlife use, the increase of people living in the rural/suburban fringe, and wildlife-people problems.

More research on the trends of wildlife attitudes and values is necessary. This project is one of the first analyses of wildlife attitudes and values to examine trends based on respondent information rather than media coverage of events (e.g., Kellert and Westervelt, 1983). Although there are some limitations to the interpretation of results, this research highlights the need for critical evaluations of assumptions and increased attention to monitoring changes in attitudes and beliefs of the public's wildlife attitudes.

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APPENDIX A

People differ in the ways they interact with wildlife. Some of these ways are listed below. Please indicate how you feel about the following by your agreement or disagreement with each statement.

It is important for me personally that:

1. People consider the presence of wildlife as a sign of the quality of the natural environment.
2. People know that wildlife exist in nature.
3. People appreciate the role that wildlife play in the natural environment.
4. People understand more about the behavior of wildlife.
5. Wildlife are included in educational materials as the subject for learning more about nature.
6. People talk about wildlife with family and friends.
7. People observe or photograph wildlife.
8. People see wildlife in books, movies, paintings, or photographs.
9. People express opinions about wildlife and their management to public officials or to officers of private conservation organizations.
10. People trap furbearing animals for sale of furs or pelts.
11. People hunt game animals for recreation.
12. People hunt game animals for food.
13. Game animals are managed for an annual harvest for human use without harming the future of the wildlife population.
14. Local economies benefit from the sale of equipment, supplies, or services related to wildlife.
15. People tolerate most wildlife nuisance problems.
16. People tolerate most levels of property damage by wildlife.
17. People tolerate the ordinary risk of wildlife transmitting disease to humans or domestic animals.
18. People tolerate the ordinary personal safety hazards associated with some wildlife.