STANDARDIZING BASIC WILDLIFE ATTITUDES AND VALUES DATA ACQUISITION METHODS

BY

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FINAL REPORT

STATE: New York

PROJECT NUMBER: W-146-R-8

PROJECT TITLE: Public Attitudes Toward Wildlife and Its Accessibility

STUDY NUMBER AND TITLE: VIII - Identifying Attitudes and Values Toward Species and Their Management

JOB NUMBER AND TITLE: VIII-4 - Standardizing Basic Wildlife Attitudes and Values Data Acquisition Methods

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FINAL REPORT

State:	New York
Project Number:	W-146-R-8
Project Title:	Public Attitudes Toward Wildlife and Its Accessibility
Study Number and Title:	VIII - Identifying Attitudes and Values Toward Species and Their Management
Study Objective:	To discern, specific to key public segregation, the attitudes held toward species traditionally associated with selected values or costs, the compatability and effectiveness of management of species, and the public's satisfaction with the DEC's efforts to manage those species.
Job Number and Title:	VIII-4 - Standardizing Basic Wildlife Attitudes and Values Data Acquisition Methods
Job Objective:	To develop, based on instruments designed and used previously in this study, a standardized set of items for wildlife attitudes and values determination to be used in subsequent public attitude surveys, thereby decreasing instrument development cost in future surveys, allowing cross-audience comparisons, and facilitating comparisons over time for the same public.
Job Duration:	1 December 1982 - 31 March 1983

ABSTRACT: Enhancing wildlife managers' understanding of public values, concerns, and attitudes toward wildlife has been a major emphasis of Project W-146-R, Study VIII. Development of a measurement instrument sensitive to people's attitudes toward wildlife is tantamount to the process of obtaining the information necessary to permit managers to respond effectively to the wide range of publics interested in wildlife. This report details efforts to develop, based on instruments designed and used previously in Project 146 studies, a standardized wildlife attitude scale that will provide reliable and program-useful information when included in surveys dealing with public attitudes toward wildlife and wildlife management.

Three prior studies have provided opportunities for preliminary development and refinements of the wildlife attitude scale discussed herein: Project 146-R: Jobs (1) VIII-1, "Design and Preliminary Studies for Identifying Attitudes and Values Toward Species and Their Management," (2) I-8, "Public Tolerance of an Increased Black Bear Population in the Catskill Mountains," and (3) VII-11, "First-year Evaluation of the 'Return-a-Gift to Wildlife' Program Promotion Efforts." The scaling instruments used within these studies have been based on a theoretical framework of the ways people value wildlife. Within this framework, six dimensions of values are identified: recreational, aesthetic, educational, biological, social, and commercial. Operationalizing these within a measurement instrument has involved the use of Likert or summative scaling techniques. The data obtained from scale applications have been evaluated and the results of both empirical and statistical tests, including factor analytic techniques, have provided a rationale for modifications to standardize an instrument for assessing wildlife attitudes. The instrument proposed in this report is expected to increase the quality and applicability of wildlife attitude information obtained for New York wildlife managers. However, further testing will be conducted to ensure achievement of scale standardization.

The importance of these efforts is far reaching. By standardizing the scale and using it with a variety of audiences, managers will gain a more complete picture of similarities and differences existing among their clientele. Informative differences may exist between types of users, geographic regions, or for kinds of wildlife. Changes in wildlife attitudes or orientations may also be detected for the same group over time. Monitoring these differences and changes allows managers to take a more refined approach to program planning.

Forthcoming Project 146 studies intended to increase our understanding of wildlife attitudes and beliefs provide ideal opportunities to culminate scale development. Use of the attitude scale is expected to provide an important contribution to the following studies: Job VIII-8, "Northern New York Recreationists Study;" VII-7, "Familial Impediments and Incentives to Hunting and Trapping Participation;" and VII-8, "Dynamics of Hunting and Trapping Participation Over Time." Continued development can therefore be accomplished at nominal additional cost and with no real need to carry a separate job for this effort.

PURPOSE

The Bureau of Wildlife, Division of Fish and Wildlife, New York State Department of Environmental Conservation (DEC), is responsible for the efficient management of the wildlife resources of the State. Two of the Bureau's primary goals are:

1. To provide maximum beneficial utilization and opportunity for enjoyment of wildlife resources.
2. To manage wildlife resources so that their numbers and occurrences are compatible with the public interest (NYSDEC 1977:1).

To accomplish these goals, DEC planning efforts for species management programs need input on the wildlife-related values, concerns, and attitudes of a wide array of publics interested in wildlife. Supplied with this information it is more likely that DEC will be able to initiate actions to achieve its combined mission of serving public interest and protecting wildlife resources.

Meeting this information need has been the focus of Project W-146-R, Study VIII. Attempts to identify public attitudes toward wildlife have been a major emphasis of the study. In the continuing process of seeking to enhance managers' understanding of public values, concerns, and attitudes toward wildlife, the objective of this phase of the study is:

> To develop, based on instruments designed and used previously in this study, a standardized set of items for wildlife attitudes and values determination to be used in subsequent public attitude surveys, thereby decreasing instrument development cost in future surveys, allowing cross-audience comparisons, and facilitating comparisons over time for the same public.

BACKGROUND

Brown et al. (1980) provide a detailed discussion of the conceptual development of the study. The concepts of beliefs (perceived values of a species), values (attributes or uses), and attitudes (support/oppose, favorable/unfavorable, or similar bipolar evaluations of beliefs) are defined in terms of their application to the research. Based on this framework, the ensuing preliminary studies (Decker et al. 1981, Purdy et al. 1983) have attempted to identify a spectrum of indicators of wildlife values (e.g., photographing wildlife), develop an instrument for evaluation of individuals' beliefs in these indicators (hereafter referred to as "values"), assess public attitudes toward wildlife, and develop other methods for incorporating wildlife attitude information into a management synthesis.

The wildlife values typology used in these preliminary studies was adapted from those conceptualized by King (1947) and Fried (1979). King's classification of values provided the general framework while specific values were extracted from Fried's list. The typology resulting from this selection is shown in Table 1.

As illustrated, the typology identifies six conceptual "dimensions" or groups containing 25 types of values. The table also contains examples of the ways each type of wildlife is valued. The specific values were selected to present a wide range of values and to exemplify those that might frequently be involved in management issues. Furthermore, it was assumed that individuals generally held beliefs about these values. To enable the actual assessment of attitudes toward these wildlife values, it was recognized that the typology must permit individuals to identify the strength of their beliefs on a bipolar evaluative continuum. That is, a scaling procedure had to be developed that would indicate whether a person perceived the values as positive or negative and also indicate the relative strength (e.g., strongly-slightly) of these beliefs.

Table 1. THE INITIAL TYPOLOGY OF WILDLIFE VALUES

Value Indicators	Examples
Recreational*	
extractive	hunting and trapping
nonextractive	observation, bird watching, photography, etc. for the primary purpose of enjoying wildlife
vicarious	story-telling, planning a wildlife-related trip, reading about one, etc.
expected experience	camping, hiking, canoeing, picnicking, etc., where enjoyment of wildlife is one of the primary considerations of the experience
unexpected experience	incidental sightings while recreating around home, etc.
Aesthetic*	
unexpected	incidental sightings while around home or work, while commuting, etc.
art	in photography, art, movies, books, etc.
affection	unarticulable affection or dislike between humans and wildlife
Educational*	
ecological principles	examples of ecological principles like energy flow
renewable resources	examples of resource renewability
medical research	medical experiments
behavioral study	behavioral observations
Biological*	
environmental quality monitor	wildlife as indicators of levels of quality of the natural environment
chemical	transformation of plant material into animal protein
ecological role	how species effect each other, role in natural systems

Table 1. (continued)

Value Indicators	Examples
Social*	
social action	a "cause" or focus for social action or reform
socializing	people brought together by wildlife-related recreation
disease vector	disease transmission and reservoir for humans and livestock
nuisance	a nuisance, like deer-car collisions, beaver flooding roads
Commercial*	
damage	damage, like deer and orchards, bear and beehives
biocontrol	wildlife used in pest control
consumable resource	food, furs, hides, other raw materials
indirect commodity	used as subject of "quasi-educational" field guides, movies, etc.
recreation support	wildlife-related recreation supplies, equipment and services
commodity association	used as focus of advertisements, movies, books, etc.

* Theoretical dimensions of wildlife values proposed by King (1947).

Obtaining information in such a format would provide insights regarding people's attitudes about wildlife and perhaps more importantly, could help predict DEC constituencies' positive or negative reactions to wildlife program planning situations where public input is desired and management issues are expected to involve similar wildlife values. Identification of these impediments or incentives to the communication process is essential for effective wildlife planning and will be greatly facilitated through the use of the wildlife attitude scale discussed herein.

Instrument Development and Use

Development and application of scaling techniques to the wildlife values typology has involved the use of Likert or summative scaling methods, procedures commonly used by social scientists for the measurement of attitudes (Likert 1932, Fishbein and Ajzen 1975, McIver and Carmines 1981). Simply stated, the Likert method typically enables depiction of a person's positive/negative attitude towards some concept by summing numerical ratings of scale statements that reflect beliefs about this concept. As applied to the wildlife values typology, these scores can be used to indicate both a direction and intensity of an individual's attitude toward each of the "dimensions" (e.g., recreational dimension) of wildlife values. Furthermore, the cumulative scores of all dimensions are used to indicate an overall attitude toward wildlife.

The initial opportunity to test the instrument was provided in the preliminary study conducted in 1980-81 (Job VIII-1, "Design and Preliminary Studies for Identifying Attitudes and Values Toward Species and Their Management"); an exploratory effort to determine wildlife attitudes and values and one which was largely directed toward development and pretest of measurement methods (Decker et al. 1981). The original scaling instrument (Appendix A-1) was applied to samples of DEC Bureau of Wildlife personnel and leaders of key wildlife interest groups in New York State. Findings of the survey reflected the value of the instrument in terms of providing insights regarding expectations of public response to wildlife planning activities. As desired, areas suitable for further instrument refinements were identified.

Based on empirical evaluations of the results from the preliminary study, instrument modifications were conducted. Following these changes, the tool was incorporated into two surveys associated with other Project 146 studies occurring

in 1983: Study I, Job I-8, "Public Tolerance of an Increased Bear Population in the Catskills" (Smolka et al., in press), and Study VII, Job VII-11, "First-Year Evaluation of the Return-a-Gift to Wildlife Program Promotion Efforts" (Connelly et al., in press). Due to differences in both audiences and issues addressed, in addition to other practical survey constraints, the scales utilized in each survey differed slightly (Appendices A-2 and A-3). Attempts were made, however, to maintain as much consistency between instruments as possible to facilitate comparisons. As with the preliminary study, these additional surveys enabled further limited testing and refinement of the attitude scale.

Results obtained from the aforementioned studies provide promising indications of the instrument's ability to obtain indices of individuals' wildlife attitudes. To date, however, development efforts have largely concentrated on implementing empirically-refined versions of the scale in appropriate surveys. This has been necessary to obtain sufficient data for preliminary refinements and preparations for subsequent detailed scale evaluations. Based on these previous survey implementations, we can now better address the central objective of instrument development--constructing a standardized attitude scale that can be used in subsequent surveys dealing with public attitudes toward wildlife and their management.

METHODS

The data used for the detailed scale evaluations conducted in this study came from past Project 146 surveys utilizing the wildlife attitude scale. Although these have been mentioned previously, an overview is provided in Table 2.

Table 2. SUMMARY OF SURVEYS USING THE WILDLIFE ATTITUDE SCALE.

Study-Job	Title	Audience
VIII-1	Design and Preliminary Studies for Identifying Attitudes and Values Toward Species and Their Management (1981)	Selected leaders of New York wildlife interest groups (N = 38)
I-8	Public Tolerance of an Increased Black Bear Population in the Catskills (1983)	Randomly sampled private landowners residing in the Catskill Mountain region (N = 600)
VII-11	First-Year Evaluation of the "Return-a-Gift to Wildlife" Program Promotion Efforts (1983)	Randomly sampled New York state residents (N = 2,315)

The data obtained from these studies were evaluated in relation to instrument validity (i.e., Is the instrument appropriate for the concepts that need to be measured?) and reliability (i.e., Does the instrument yield consistent results?). The data were analyzed using the Statistical Package for the Social Sciences computer program. The following tests of criterion were systematically applied to each data set.

First, we wanted to examine whether the scale statements (i.e., values) fit our intuitive notions about which statements might be related to the six conceptual "dimensions" identified in the typology. To accomplish this, a principal components factor analysis (Kim and Mueller 1978) was performed on all statements within the scale. Briefly, factor analysis is a data reduction technique that computes an array of correlation coefficients for a set of variables and uses these correlation coefficients to reduce (i.e., combine) the full array of variables to smaller groups of variables, or hypothetical "factors" that explain underlying relationships in the data. These factors identify dimensions within the overall domain of wildlife values

examined. Additionally, the strength of the relationships between scale statements and factors are indicated by correlation coefficients termed "factor loadings."

Next, estimates of scale reliability were obtained. Although there was no opportunity to test reliability in an ideal manner (i.e., by comparing one administration of the instrument with another administration to the same group of people), separate survey assessments enabled the desired measures of reliability to be obtained. Item analysis procedures were used to test both individual statement reliability and dimension reliability.

For each dimension, the primary measure of reliability used was Cronbach's Alpha, calculated from the formula: $\alpha = \frac{n\bar{r}}{1 + (n-1)\,\bar{r}}$, where n = the number of items (value indicators or statements) in the dimensions and $\bar{r}$ = the average inter-item correlation (Carmines and Zeller 1979). Calculation of this statistic provides an assessment of how well a group of statements measure the dimension of interest.

To refine individual scale statements, item-to-total, alpha-if-item-deleted, and squared multiple (R^2) correlations were calculated. Both item-to-total and alpha-if-item-deleted correlations provide measures of how well a particular statement measures the dimension to which it relates; R^2 indicates the proportion of variance of a particular statement that is explained by the interaction of the remaining statements in the dimension (statements promoting large variances tend to add more to scale reliability). For all of the above statistics, reliability increases as the numerical values approach + 1.0.

Lastly, assessments of validity were conducted. Consultations with Project 146 staff and using the aforementioned surveys as criterion-group studies allowed us to evaluate the ability of the instrument to measure the desired constructs of wildlife values.

FINDINGS

The results presented herein were obtained from evaluations of each of the three scaling instruments designed and used previously in Project 146 surveys. These findings are intended to provide a rationale for the development of a standardized wildlife attitude scale to be used in subsequent surveys pertaining to public attitudes toward wildlife and their management.

Although the scales used in each of the previous surveys are similar, there are several factors which limit comparative evaluations between instruments: (1) differences in the audiences of each survey, (2) inter-survey refinements in the wording of scale statements, and (3) inter-survey refinements in the format of response categories. Due to these limitations, evaluations were directed toward determining strengths and weaknesses of individual instruments. Improving the strengths of each instrument and resolving any problems became the focus of our efforts to construct a standardized scale sensitive to people's wildlife attitudes.

The following results are organized according to the chronological order in which the instruments were used in surveys. For brevity, these surveys will hereafter be referred to as: (1) the 1981 Preliminary Survey (Job VIII-1), (2) the 1983 Black Bear Tolerance Survey (Job I-8), and (3) the 1983 Return-A-Gift Survey (Job VII-11).

1981 Preliminary Survey

Due to the exploratory nature of this early survey, we did not subject the instrument to the detailed statistical evaluations undertaken with the data from other surveys. However, several important changes were made based on empirical assessments of the instrument.

Upon completion of the survey involving personal interviews with 38 leaders of New York State wildlife interest groups, a review of scale responses indicated that several wildlife values were either unclear, imprecise, or otherwise difficult for people to conceptualize. Values with these problems were excluded from the instrument when we believed their contribution to scale integrity was questionable. Also, some values were judged to be inherently vague, such as 'affection' and 'indirect commodity,' and when changes would not have increased their clarity, such values were deleted. Altogether, 11 of the original 25 values appeared to add little to scale quality and thus were excluded from the instrument. To increase the clarity of those values surviving the initial critiques, most scale statements were subjected to limited rewordings or other appropriate modifications (Table 3). The opportunity to evaluate these changes arose in 1983 with the need to assess public tolerances of an increased black bear population in the Catskill Mountains.

1983 Black Bear Tolerance Survey

Using data obtained from 600 private landowners in the Catskill region, we were able to conduct the desired statistical evaluations of the attitude scale. These tests were conducted with regard to the following two types of data: attitudes toward wildlife in general and attitudes specifically toward black bears.

Results from the two data sets were nearly identical, suggesting that Catskill region landowners' attitudes toward black bears are extremely similar to those that would likely be expressed about most other species. Due to this similarity, there is little need to use both data sets for evaluating the scale. Therefore, the following discussion will be confined to the results obtained from the analysis of attitudes toward wildlife in general.

Table 3. FIRST STAGE INSTRUMENT MODIFICATIONS CONDUCTED FOLLOWING THE 1981 PRELIMINARY ATTITUDES/VALUES SURVEY

Items Used for Job VIII-1		Modifications Implemented in Jobs I-8 and VII-11
Value Indicators	Examples	Value Indicator Statements
Recreational		
extractive	hunting and trapping	Hunting for recreation
nonextractive	observation, bird watching, photography, etc. for the primary purpose of enjoying wildlife	Observing or photographing wildlife
vicarious	story-telling, planning a wildlife related trip, reading about one, etc.	Talking about wildlife and wildlife sightings with family and friends
expected experience[D]	camping, hiking, canoeing, picnicking, etc., where enjoyment of wildlife is one of the primary considerations of the experience	
unexpected experience	incidental sightings while recreating around home, etc.	Seeing wildlife unexpectedly
Aesthetic		
unexpected	incidental sightings around home or work, while commuting, etc.	
art	in photography, art, movies, books, etc.	Books, movies, paintings or photographs about wildlife
affection[D]	unarticulable affection or dislike between humans and wildlife	
Educational		
ecological principles[D]	examples of ecological principles like energy flow	++Wildlife as subject for learning more about nature
renewable resources[D]	examples of resource renewability	
medical research[D]	medical experiments	
behavioral study	behavioral observations	Using wildlife in behavior studies
Biological		
environmental quality monitor[D]	wildlife as indicators of levels of quality of the natural environment	
chemical[D]	transformation of plant material into animal protein	
ecological role	how species effect each other, role in natural systems	Wildlife's role in the ecology of the Catskills

Table 3. (continued)

Items Used for Job VIII-1		Modifications Implemented in Jobs I-8 and VII-11
Value Indicators	Examples	Value Indicator Statements
Social		
social action	a "cause" or focus for social action or reform	Expressing concern for wildlife and their management to public officials or to officers of private organizations
socializing[D]	people brought together by wildlife related recreation	
disease vector	disease transmission and reservoir for humans and livestock	Wildlife transmitting diseases to humans or domestic animals
nuisance	a nuisance, like deer-car collisions, beaver flooding roads	++Just knowing wildlife exist in the Catskills
Commercial		
damage	damage, like deer and orchards, bears and beehives	Damage or nuisance problems caused by wildlife
biocontrol[D]	wildlife used in pest control	
consumable resource	food, furs, hides, other raw materials	Management of wildlife for a sustained harvest for human use without harming the future of the wildlife populations
indirect commodity[D]	used as subject of "quasi-educational" field guides, movies, etc.	
recreation support	wildlife related recreation supplies, equipment and services	Local economic benefits from the sale of equipment, supplies or services that make recreational enjoyment of wildlife possible
commodity association[D]	used as focus of advertisements, movies, books, etc.	

D = Items deleted from instrument.
++ = Newly created items.

Dimensions of general wildlife values: In contrast to our a priori notions of six dimensions of wildlife values, only half this number were derived by factor analysis, an indication that people's attitudes toward wildlife can be categorized more simply than earlier expected. These three dimensions (described as Appreciative, Exploitive, and Depreciative dimensions) and the values included in each are shown in Figure 1. Attempts to "force" the factoring procedure to group the values into six factors proved unsuccessful in reproducing the original conceptual dimensions, further supporting the validity of only three dimensions of wildlife values.

Testing the reliability of scale items proved encouraging. Although the Depreciative and Exploitive factors appeared to require additional measures of the dimensions, in general, the relationships between the values and the dimensions they represent were relatively strong (Table 4). These findings suggested that for nearly all scale statements we could have relatively high expectations of consistent results in subsequent scaling efforts.

In addition to these evaluations, we concurrently had the opportunity to analyze results of the attitude scale used in the 1983 Return-A-Gift Survey. Although slight modifications were included in the instrument used in this particular survey, the content was very similar to that of the 1983 Black Bear Tolerance Survey. Based on this, we believe the following information provides the strongest comparative analysis of the scale to date.

1983 Return-a-Gift Survey

Presented with the opportunity to conduct our evaluations on a second large sample (N = 2,315), we again subjected the data obtained from this survey to rigorous statistical tests. Factor analysis of the data supported the earlier finding of fewer dimensions than were hypothesized in our conceptual framework

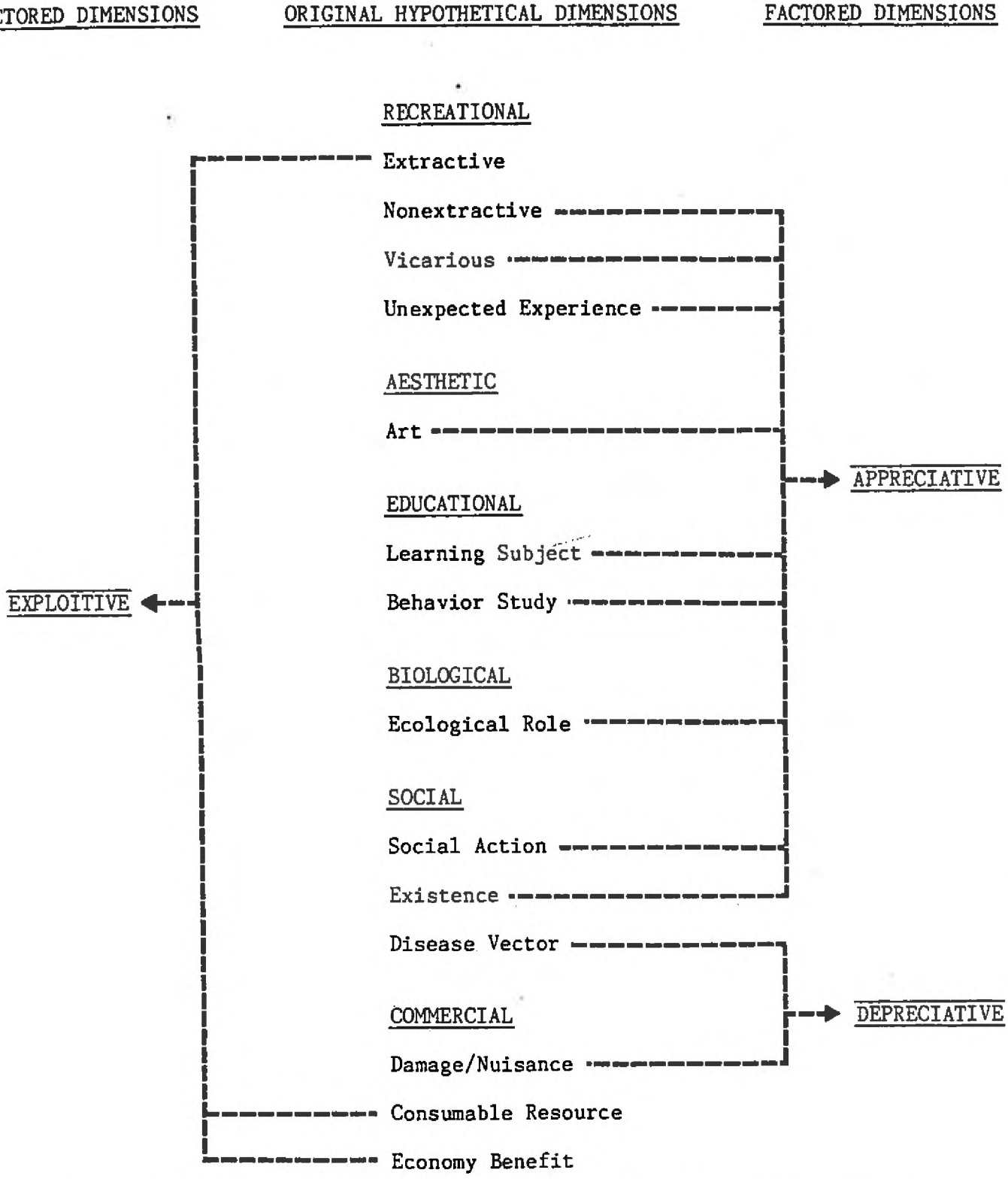

Figure 1. Factor Analysis Derivations of Wildlife Values Dimensions Based on the 1983 Black Bear Tolerance Survey Data.

Table 4. SCALE RELIABILITY STATISTICS OBTAINED FROM THE 1983 BLACK BEAR TOLERANCE SURVEY DATA (N=504).

Factor (Dimension)	Factor Loading	R^2	Item-to-Total Correlation	Alpha-if-Item-Deleted
APPRECIATIVE				
Vicarious	.70	.45	.62	.83
Nonextractive	.66	.40	.58	.83
Unexpected Experience	.57	.36	.45	.84
Art	.63	.39	.60	.83
Social Action	.54	.37	.57	.83
Existence	.68	.45	.64	.83
Ecological Role	.58	.39	.58	.83
Behavior Study	.40	.31	.45	.85
Learning Subject	.65	.47	.66	.82
Appreciative Dimension Reliability (Alpha) = .85				
EXPLOITIVE				
Extractive	.55	.19	.44	.66
Consumable Resource	.70	.29	.52	.54
Economic Benefit	.62	.29	.51	.54
Exploitive Dimension Reliability (Alpha) = .68				
DEPRECIATIVE				
Disease Vector	.76	.29	.54	---
Damage/Nuisance	.67	.29	.54	---
Depreciative Dimension Reliability (Alpha) = .70				

based on King's classification system; once again, three similar dimensions were derived from the data. These derivations of factors, however, demonstrated some "wobbling" of the values between the dimensions. That is, the groupings of values were somewhat different from those of the 1983 Black Bear Tolerance Survey (Figure 2). The differences in dimensions between the two audiences evaluated simply illustrate that two groups of people with somewhat different characteristics tend to conceptualize wildlife values in slightly different manners. Of primary importance to our scale standardization effort was that the "structure" or fundamental associations of values within dimensions remained intuitively meaningful (except for the questionable Depreciative dimension) and showed strong similarities to the previous evaluations. This is important because scale statements, worded in such a manner that different people perceive them in totally different ways, cannot be said to measure similar wildlife values, beliefs, and attitudes among different audiences. Results of this analysis, however, show relatively strong conceptual similarities between the two surveys.

Analysis of scale reliability (Table 5) was also similar to that of previous tests. As might be expected, the "wobbling" of some statements appeared to have an effect of slightly decreasing reliability. Development efforts are presently concentrating on mitigating this effect.

Due to these evaluations of previous surveys, several modifications were deemed necessary to prepare a standardized instrument for assessing wildlife attitudes. The following discussion provides a rationale for these changes as preparation for the final development stages of the desired instrument.

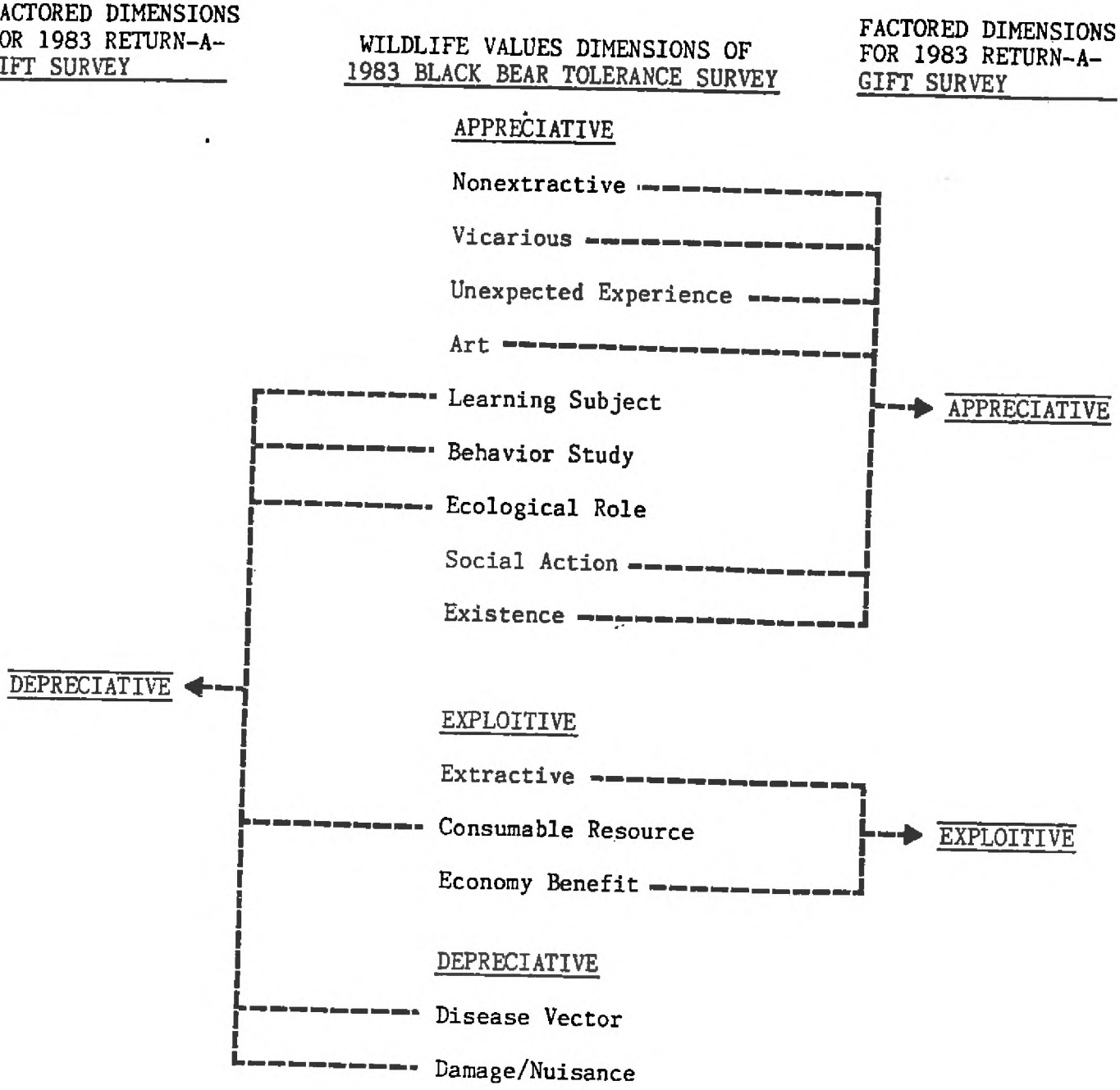

Figure 2. Comparisons of Factor Analysis Results Between the 1983 Black Bear Tolerance Survey and the 1983 Return-a-Gift Survey.

Table 5. SCALE RELIABILITY STATISTICS OBTAINED FROM THE 1983 RETURN-A-GIFT SURVEY DATA (N=2,072).

Factor (Dimension)	Factor Loading	R^2	Item-to-Total Correlation	Alpha-if-Item-Deleted
APPRECIATIVE				
Nonextractive	.78	.52	.69	.21
Vicarious	.78	.49	.68	.81
Unexpected Experience	.76	.46	.64	.82
Art	.68	.42	.64	.82
Existence	.67	.33	.55	.84
Social Action	.65	.60	.39	.83
	Appreciative Dimension Reliability (Alpha) = .85			
EXPLOITIVE				
Extractive	.85	.10	.32	--
Economy Benefit	.54	.10	.32	--
	Exploitive Dimension Reliability (Alpha) = .49			
DEPRECIATIVE				
Damage/Nuisance	.76	.40	.56	.76
Disease Vector	.75	.36	.49	.78
Behavior Study	.61	.36	.56	.76
Consumable Resource	.59	.32	.54	.77
Learning Subject	.58	.44	.61	.75
Ecological Role	.57	.36	.55	.77
	Depreciative Dimension Reliability (Alpha) = .80			

Modifications Needed for Scale Standardization

The first question that must be addressed to achieve standardization is that of the underlying number and content of the dimensions of wildlife values. As shown in the aforementioned statistical analysis, given the domain of wildlife values selected for use, there appear to be three dimensions in which people conceptualize these values, descriptively labelled as Appreciative, Exploitive, and Depreciative dimensions. Within these dimensions, the objective is to select valid statements or indicators of wildlife values that represent each dimension. Furthermore, there must be a sufficient number of values within each dimension to ensure the dimension will be represented reliably with repetitive uses of the instrument.

Questions of the validity of values to be included in the instrument were addressed by an in-depth review of scale values existing in the previously mentioned surveys. Following this review by Project 146 staff, it was agreed that existing value statements were appropriately valid for the dimensions represented and also that overall scale quality could be increased by modifying values in the following ways:

1. Making statements as clear, concise, and unambiguous as possible.
2. Modifying all statements to stand as expressions of desired behavior, not fact. This permits increased understanding of individuals' intentions by measuring beliefs about performing the expressed behavior.
3. Personalizing values by relating the concept of "personal importance" to each value statement so that attitudes reflect individual, not societal concerns.

In conjunction with these guidelines for each of the values in the scale, it is necessary to provide an appropriate bipolar evaluative continuum that enables individuals to respond to the personalized nature of the values. Using the previous important-unimportant labels alone does not allow a determination of why some value is either important or unimportant. For instance, if a person simply

indicates that hunting for recreation is important, is this because he/she favors or disfavors hunting? It is an unknown. However, using agree-disagree response categories with a value statement suggesting importance enables an understanding of one's position toward the wildlife value. By associating a measure of strength to the label (e.g., strongly-slightly), the intensity of a person's belief can also be determined. These additions are necessary to approach standardization.

To increase scale reliability, other changes are required. First, attempts to clarify all values, as indicated above, may be expected to increase the reliability of individual statements. The reliability of the entire dimension, however, is not only dependent upon the quality of each value within it, but also the quantity of values in the dimension. Two of the dimensions (Exploitive and Depreciative) have had too few items within them to maintain reliability over repeated uses. Therefore, additional statements have been developed that are expected to conform to the scale dimensions and also provide reliable measures of them (Table 6).

Based on the above findings, the wildlife attitude scale shown in Figure 3 has been developed. To date, testing of these improvements has been limited to small groups (e.g., Cornell University students in a "Principles of Wildlife Management" class) for critiquing purposes. This scale is the most advanced to date and is expected to increase the quality and applicability of wildlife attitude information obtained for New York wildlife managers.

Table 6. WILDLIFE VALUE INDICATOR STATEMENTS SELECTED FOR SCALE STANDARDIZATION.

Dimension and Value Indicator Label	Statement
APPRECIATIVE	
Vicarious	Talk about wildlife with family and friends.
Nonextractive	Observe or photograph wildlife.
Environmental Quality Monitor	Consider the presence of wildlife as a sign of quality of the natural environment.
Art	See wildlife in books, movies, paintings, or photographs.
Social Action	Express opinions about wildlife and their management to public officials or to officers of private conservation organizations.
Existence	Just know that wildlife exist in nature.
Ecological Role	Appreciate the role that wildlife play in the natural environment.
Learning Subject	Include wildlife in educational materials as the subject for learning more about nature.
Behavior Study	Understand more about the behavior of wildlife.
EXPLOITIVE	
Recreational Hunting	Hunt game animals for recreation.
Trapping	Trap furbearing animals for the sale of fur or pelts.
Meat Hunting	Hunt game animals for food.
Economy Benefit	Local economies benefit from the sale of equipment, supplies, or services related to wildlife recreation.
Sustained Harvest	Manage game animals for a sustained harvest for human use without harming the future of the wildlife population.
DEPRECIATIVE	
Nuisance	Tolerate ordinary wildlife nuisance problems.
Damage	Tolerate ordinary levels of property damage by wildlife.
Disease Risk	Tolerate the ordinary risk of wildlife transmitting disease to humans or domestic animals.
Safety Risk	Tolerate the ordinary personal safety hazards associated with some wildlife.

People differ in the ways they respond to wildlife. Some of these ways are listed below. Please indicate how you feel about the following by your agreement or disagreement with each statement. (Indicate your response for each statement by checking (✓) the appropriate category.)

IT IS IMPORTANT TO ME PERSONALLY:	Strongly agree	Moderately agree	Slightly agree	Neither agree nor disagree	Slightly disagree	Moderately disagree	Strongly disagree
That I talk about wildlife with family and friends	( )	( )	( )	( )	( )	( )	( )
That I observe or photograph wildlife	( )	( )	( )	( )	( )	( )	( )
That I tolerate ordinary wildlife nuisance problems	( )	( )	( )	( )	( )	( )	( )
That I trap furbearing animals for the sale of furs or pelts	( )	( )	( )	( )	( )	( )	( )
That I consider the presence of wildlife as a sign of the quality of the natural environment	( )	( )	( )	( )	( )	( )	( )
That I hunt game animals for recreation	( )	( )	( )	( )	( )	( )	( )
That I see wildlife in books, movies, paintings, or photographs	( )	( )	( )	( )	( )	( )	( )
That I tolerate ordinary levels of property damage by wildlife	( )	( )	( )	( )	( )	( )	( )
That I express opinions about wildlife and their management to public officials or to officers of private conservation organizations	( )	( )	( )	( )	( )	( )	( )
That I just know that wildlife exist in nature	( )	( )	( )	( )	( )	( )	( )
That I tolerate the ordinary risk of wildlife transmitting disease to humans or domestic animals	( )	( )	( )	( )	( )	( )	( )
That I hunt game animals for food	( )	( )	( )	( )	( )	( )	( )
That local economies benefit from the sale of equipment, supplies, or services related to wildlife recreation	( )	( )	( )	( )	( )	( )	( )
That I appreciate the role that wildlife play in the natural environment	( )	( )	( )	( )	( )	( )	( )
That wildlife are included in educational materials as the subject for learning more about nature	( )	( )	( )	( )	( )	( )	( )
That game animals are managed for an annual harvest for human use without harming the future of the wildlife population	( )	( )	( )	( )	( )	( )	( )
That I tolerate the ordinary personal safety hazards associated with some wildlife	( )	( )	( )	( )	( )	( )	( )
That I understand more about the behavior of wildlife	( )	( )	( )	( )	( )	( )	( )

Figure 3. Improved Scaling Instrument for Wildlife Attitude Assessment.

Importance of Continued Scale Use and Development

Although this report has dealt with specific concerns pertaining to the technical process of developing an instrument for assessment of wildlife attitudes, it may be of value to digress briefly to re-emphasize and understand the importance of such an instrument.

The ultimate goal of our scale development effort is to construct a device that will provide information to assist prediction of people's positive or negative responses to wildlife issues or programming activities. The information that can be obtained through the use of the attitude scale cannot alone meet this predictive need. However, when used in combination with other information about people's beliefs, such capabilities become possible. Specifically, the attitude scale is designed to elicit responses that reflect three components of people's overall orientation towards wildlife, examining aspects of inherent value, management, and human use.

Knowledge of the orientations most important to various wildlife management clientele, together with more specific information on the relevant beliefs, attitudes, behavioral intentions, and behaviors of the clientele, gives managers a much better understanding of the groups. By standardizing a scale and using it with a variety of audiences, managers will gain a more complete picture of similarities and differences existing among their clientele. Differences may exist between types of users, geographic regions, or for kinds of wildlife. Changes in orientation may also be detected for the same group over time. Monitoring these differences and changes allows managers to take a more refined approach to program planning.

RECOMMENDATIONS FOR FUTURE RESEARCH

Increasingly, wildlife managers must be sensitive to a wide range of publics interested in wildlife. To do so, they must understand the publics' wildlife-related attitudes, concerns, and opinions. Development of the wildlife attitude scale discussed in this report is tantamount to the process of obtaining this information. A standardized attitude scale, such as that being developed in this study, will not only allow additional insights into single audiences but also cross-audience comparisions and long-term comparisons for the same public.

Although the scale developed in this report appears to be approaching standardization, only further testing can assure this. We expect that with approximately three further implementations in surveys with adequate sample sizes, refinements can be conducted that will allow development efforts to be terminated. Forthcoming Project 146 studies which are anticipated to increase our understanding of wildlife attitudes and beliefs, Study VIII, Job VIII-8 (Northern New York Recreationists Study), and Study VII, Jobs VII-7 (Familial Impediments and Incentives to Hunting and Trapping Participation) and VII-8 (Dynamics of Hunting and Trapping Participation Over Time), provide ideal opportunities to culminate this development. Use of the attitude scale is anticipated to be an important contributor to these projects. Its continued development can therefore be accomplished at nominal additional cost and with no real need to carry a separate job for this effort.

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APPENDIX A:

WILDLIFE ATTITUDE SCALING INSTRUMENTS APPLIED IN PREVIOUS PROJECT 146 SURVEYS

Appendix A-1. Originally Developed Scaling Instrument Applied in 1981 "Preliminary Attitudes/Values Survey" (Job VIII-1).

Perceived "values" interest groups attribute to wildlife, attitude of the interest groups toward the value, and importance of the value to the interest group.

Organizations' Potential Beliefs About "Values"	Attitude		Importance			
	Fav.	Opp.	S.I.	M.I.	Very I.	DK
Recreational:						
1 extractive						
2 nonextractive						
3 vicarious						
4 expected experience						
5 unexpected experience						
other:						
Aesthetic:						
6 unexpected						
7 art						
8 affection						
other:						
Educational:						
9 ecological principles						
10 renewable resource						
11 medical research						
12 behavioral study						
other:						
Biological:						
13 envir. qual. monitor						
14 chemical						
15 ecological role						
16 other:						
Social:						
16 social action						
17 socializing						
18 disease vector						
19 nuisance						
other:						
Commercial:						
20 damage						
21 biocontrol						
22 consumable resource						
23 indirect commodity						
24 recreation support						
25 commodity assoc.						
other:						

Appendix A-2. Scaling Instrument Applied in the 1983 Black Bear Tolerance Survey (Job I-8).

Wildlife and bears are valued by people in many different ways. Some of these values are listed below. How important or unimportant are these values to you? (Please circle TWO responses for each value - one from the "wildlife in general" column and the other from the "Black Bear" column.)

FOR WILDLIFE IN GENERAL						ONLY FOR BLACK BEARS				
VERY IMPORTANT (1)	MODERATELY IMPORTANT (2)	NEUTRAL (3)	MODERATELY UNIMPORTANT (4)	VERY UNIMPORTANT (5)	VALUES OF WILDLIFE/BEARS	VERY IMPORTANT (1)	MODERATELY IMPORTANT (2)	NEUTRAL (3)	MODERATELY UNIMPORTANT (4)	VERY UNIMPORTANT (5)
1	2	3	4	5	Talking about wildlife/bears and wildlife/bear sightings with family and friends	1	2	3	4	5
1	2	3	4	5	Observing or photographing wildlife/bears	1	2	3	4	5
1	2	3	4	5	Seeing wildlife/bears unexpectedly	1	2	3	4	5
1	2	3	4	5	Hunting for recreation	1	2	3	4	5
1	2	3	4	5	Books, movies, paintings or photographs about wildlife/bears	1	2	3	4	5
1	2	3	4	5	Expressing concern for wildlife/bears and their management to public officials or to officers of private organizations	1	2	3	4	5
1	2	3	4	5	Just knowing wildlife/bears exist in the Catskills	1	2	3	4	5
1	2	3	4	5	Wildlife/bears transmitting diseases to humans or domestic animals	1	2	3	4	5
1	2	3	4	5	Wildlife/bears' role in the ecology of the Catskills	1	2	3	4	5
1	2	3	4	5	Using wildlife/bears in behavior studies	1	2	3	4	5
1	2	3	4	5	Damage or nuisance problems caused by wildlife/bears	1	2	3	4	5
1	2	3	4	5	Wildlife/bears as subject for learning more about wildlife	1	2	3	4	5
1	2	3	4	5	Management of wildlife/black bears for a sustained harvest for human use without harming the future of the wildlife/bear populations	1	2	3	4	5
1	2	3	4	5	Local economic benefits from the sale of equipment, supplies or services that make recreational enjoyment of wildlife/bears possible	1	2	3	4	5

Appendix A-3. Scaling Instrument Applied in the 1983 Return-a-Gift to Wildlife Program Evaluation Survey (Job VIII-11).

Wildlife (here I mean fish, too) are important to people in many different ways. Some of these are listed below. How important or unimportant are these aspects of wildife to you? (PLEASE CIRCLE ONE RESPONSE FOR EACH ASPECT.)

Aspects of Wildlife	Very Important	Moderately Important	Neutral	Not Too Important	Not At All Important
Talking about wildlife and wildlife sightings with family and friends	1	2	3	4	5
Observing or photographing wildlife	1	2	3	4	5
Seeing wildlife unexpectedly	1	2	3	4	5
Hunting/fishing for recreation	1	2	3	4	5
Books, movies, paintings or photographs about wildlife	1	2	3	4	5
Expressing concern for wildlife and their management to public officials or to officers of private organizations	1	2	3	4	5
Just knowing wildlife exist in New York State	1	2	3	4	5
Wildlife transmitting diseases to humans or domestic animals	1	2	3	4	5
Role of wildlife in the ecology of New York State	1	2	3	4	5
Using wildlife in behavior studies	1	2	3	4	5
Potential damage or nuisance problems that could be caused by wildlife	1	2	3	4	5
Wildlife as subject for learning more about natural systems	1	2	3	4	5
Management of wildlife for a sustained harvest for human use without harming the future of the wildlife population	1	2	3	4	5
Local economic benefits from the sale of equipment, supplies or services that make recreational enjoyment of wildlife possible	1	2	3	4	5