RELATIVE IMPORTANCE OF ENFORCEMENT OBJECTIVES AND SERIOUSNESS OF VIOLATIONS IN RELATION TO OBJECTIVES[a]

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Abstract: A 2-phase procedure for scaling the importance of enforcement objectives and developing seriousness scores for violations of wildlife and natural resource laws is presented. During the first phase, 6 first-order wildlife law enforcement objectives were developed by the authors and submitted to enforcement personnel of the Virginia Commission of Game and Inland Fisheries for paired comparisons scaling. An interval scale of importance was established for the 6 objectives. Responses from a sample of 10 individuals indicated that enforcement personnel were consistent when making paired comparison judgments. A significant (P<0.01) coefficient of agreement suggested a certain amount of agreement among the judges. However, analysis of the rank order of importance of objectives for each of 3 different-ranked subgroups indicated disagreement between several of the subgroups. The rankings of officers and sergeants evidenced almost no correlation (rho=0.086) and there was a moderate negative correlation between rankings of officers and individuals with a rank of lieutenant or higher (rho=-0.314). Enforcement personnel were also requested during the first phase to associate the purpose of a law with 1 to 6 potential enforcement objectives. Perceptions of the seriousness of violations of a law in relation to detrimental impact upon achievement of an associated objective were obtained using an 11-point rating scale during the second phase. Objective-weighted seriousness scores were then obtained for each law by multiplying the mean raw seriousness score by the importance weight of the associated objective.

Objectives, or statements of desired ends, are an integral component of management systems in both private industry and government. Managerial emphasis on objectives can indicate activities in which to engage and can increase the effectiveness of public agency expenditure of time and money. Objectives are also used to structure the discretion of enforcement officers. Fifty-four percent of state wildlife enforcement divisions in the United States reported having explicit, written objectives in a recent survey (Beattie et al. 1977). Twelve of the 27 states reported having developed rank orders of importance for their objectives. Without ranked objectives, the danger may arise that personnel will work at different rates toward and use procedures to gain ends not aligned with the true desires of a particular management system.

Developing numerical values reflecting the relative seriousness of wildlife and natural resource law violation may prove beneficial for achieving the following purposes: 1) providing an additional criterion for making decsions about the court disposition of violations, 2) providing one of the criteria considered necessary in evaluating the performance of wildlife law enforcement officers, 3) maximizing the objective-related effectiveness of enforcement activities, 4) determining manpower requirements and allocation strategies for wildlife law enforcement agents, and 5) formalizing calls-for-service response decisions and determining the order in which 2 or more simultaneously-received calls-for-service would be answered.

Previous efforts to evaluate the relative seriousness of violations of conservation (wildlife and fisheries) laws have been made by Ritter (1975) and Evans et al. (1975). Ritter (1975) requested 8 enforcement administrators to judge the relative seriousness of 44 wildlife and natural resource law violations. Each of the raters assigned a seriousness score ranging from 0 (least serious) to 100 (most serious) to each of the 44 violations. The 8 raters unanimously agreed on 1 violation (spotlighting) and assigned it a seriousness score of 100. The standard deviation of the ratings for each of the remaining viola-

tions was relatively large, ranging from 10.5 to 37.3. Ritter (1975:85) suggested that one possible reason for the large variance of the ratings was that *diverse* criteria were used by raters for assigning violation seriousness scores. Pease et al. (1977:20) noticed that subjects had a difficult time evaluating the seriousness of crimes without an external or objective-related basis for comparison.

Members of the enforcement staff of the Colorado Division of Wildlife classified violations according to whether they were "serious" or "less serious" based on a consideration of perceived damages incurred by the wildlife resource and threat to human safety resulting from such violations (Evans et al. 1975).

This paper presents the results of a study designed to scale perceptions of importance of specified objectives and to develop objective-related and objective-weighted seriousness scores for violations of wildlife and natural resource laws.

METHODS

The general strategy we adopted was to 1) obtain importance weights for 6 enforcement objectives, 2) associate the purpose of a wildlife law with a particular objective, 3) acquire subjective evaluations of the relative seriousness of violations in relation to an objective, and 4) compute objective-weighted seriousness scores for violations of conservation laws. Participants in the study were professional personnel of the Law Enforcement Division of the Virginia Commission of Game and Inland Fisheries. At the time of the survey the division consisted of 87 officers (Virginia Regular Game Wardens), 27 sergeants, 12 lieutenants, 6 captains, 2 majors, and 1 colonel (enforcement chief).

The authors collectively developed 6 first-order enforcement objectives which they considered to be applicable and generalizable to enforcement divisions throughout the United States. Top-level administrators in the Enforcement Division indicated that the 6 objectives formulated approximated their division's implicit objectives. The objectives were:

1) To assure that a desired level of resource use is obtained.
2) To attempt to distribute resource use or consumption equally among users.
3) To protect public and private property from physical harm as a result of resource use.
4) To protect participating resource users from physical harm.
5) To protect non-resource users from physical harm as a result of resource use activity.
6) To insure agency income by requiring users to pay for resource use.

Scaling of enforcement objectives and development of seriousness scores was accomplished in a 2-phase procedure. On 30 June, 1977 Phase I packets were mailed to the 135 individuals of the enforcement division. The packet included a memo from the Chief of Enforcement introducing and approving of the project; a set of instructions for associating the purpose of a law with an objective; fifteen 7.62 cm x 12.70 cm paired comparisons (PC) cards, each with 2 objectives printed on the card; a listing of the 6 investigator-developed objectives and an objective statement labeled "Other"; and, a 4-page (both sides) set of 93 laws to be associated with objectives. We chose Thurstone's (1927) PC procedure for scaling perceptions of importance of objectives. The procedure consists of submitting n(n-1)/2 pairs of n statements to a collection of individuals and asking them to make comparative judgments as to which member of each pair is the more important or favorable. Enforcement personnel were requested to place the letters "MI" (for More Important) in the box to the left of the objective which they judged to be the more important of the 2. Cerain key words or phrases (e.g. desired level, resource users) included in objective statements were defined in the instructions accompanying the card packets.

Laws were assigned randomly to page and location on page to remove an ordering effect. The 93 laws listed on the 4 sheets comprised *all* fish, game, boating, and trapping laws for which 1 or more citations were issued in Virginia between 1 July 1973 and 30 June 1976. Also included in Phase I mailing packets was a self-addressed, postage-paid return mailing envelope. The return mailing address label was coded to allow indentification of the rank of the respondent (i.e. officer, sergeant, lieutenant, captain, and major or colonel) but their anonymity was retained. The colonel and both majors received the same coded mailing label. Respondents were instructed to associate the purpose of a law with a specific objective if they considered more than 50% of the purpose of the

law was to contribute to the achievement of a particular objective. If more than 50% of the purpose of a law could not be associated with any single objective, respondents were requested to write the number of the objective labeled "Other" (for other objective(s)) in the box beside the law. Computer-printed follow-up reminders were sent to all enforcement personnel on 10 July, 1977.

Thurstone (1927) presented 5 "Cases" or relevant situations appropriate to application of the PC procedure. In scaling the objective-preference data, we first assumed Thurstone's Case V. The specific assumptions underlying Case V are technically complex and are not discussed herein (e.g. normality of distribution of discriminal processes). The tenability of this assumption was tested using an internal consistency approach involving an attempt to reproduce a proportion matrix from the scale values obtained from the objective stimuli.

Responses to Phase I were analyzed prior to development of Phase II materials. Program FREQUENCIES of the Statistical Package for the Social Sciences (SPSS, Nie et al. 1976 was employed to compute the percentage of respondents associating a law with a particular objective. A law was operationally associated with a particular objective if 50% or more of the respondents were in agreement about the association of the purpose of the law with an objective. If 50% or more consensus was not achieved, the law was placed in a nonspecific objective ("Other") prior to the second phase.

Since 50% or more consensus was not reached on association of any of the 93 laws with objective 5 from Phase I, Phase II objectives consisted of 5 specific objectives (1,2,3,4,6) and a sixth non-specific objective labeled "Other." In Phase II, "Other" was defined for respondents as "Combined division objectives or other objectives." Phase II was mailed to personnel on 7 August 1977 and included instructions for completing the materials and 6 different-colored packets of stapled 6.4 cm x 21.6 cm sheets. The top sheet of each packet contained 1 of the objectives. Below the objective was an 11-point rating scale, ranging from 'NOT SEROUS AT ALL" to '"VERY SERIOUS." In addition to the top objective and rating scale sheet, each packet contained a description of the laws which had been associated with the objective in Phase I. Respondents were instructed to assign subjectively a numerical value reflecting the seriousness of violations of the law in their enforcement district on achievement of the objective. Reference points for the 11-point scale were "NOT SERIOUS AT ALL" (1), "MIDDLE SERIOUSNESS" (6), and "VERY SERIOUS" (11). Respondents were instructed that each of the 11 categories was an equal step on the scale of seriousness. An example related to traffic law enforcement was provided to clarify the procedure for completing the 6 packets.

Coded return mailing envelopes allowed us to identify the rank and enforcement district of the respondent and still maintain respondent anonymity. Computer-printed follow-up reminders were sent to personnel 14 days following initial mailing of Phase II materials.

RESULTS

Responses to Phases I and II were received from 118 (87.4%) and 107 (79.3%) individuals, respectively.
Scaling of Objectives

Table 1 presents a matrix of the objectives. Each cell of the matrix presents the proportion of times a column objective was chosen as more important than a row objective for all individuals combined. The diagonal entries involving a comparison of each objective with itself are assumed to be equal to n/2, or 0.5. The objectives have been listed in increasing order of rank of the final scale values. Each objective is identified by the number assigned it in the methods section.

Scale values for the 6 objectives were derived indirectly from normal curve tables and are presented in the lower portion of Table 1. The scale distance between objectives 2 and 6, 4 and 1, was approximately equal. The scale distance between objectives 5 and 3 was approximately twice that between objectives 6 and 4.

Although not reported here, 5 subsequent procedures were required to compute a chi-square (X^2) statistic to test the null hypothesis that the assumptions of the Case V model were tenable. The observed value of X^2 was not significant $(X^2 = 8.65, 10$ d.f., $P > 0.05)$, indicating that the assumptions involved in finding the scale values of the objectives are tenable.

Table 1. Proportion of times a column objective was judged more important than a row objective and final scale values for combined responses.

Objectives[a]	2	6	4	1	5	3
2	0.500	0.534	0.500	0.669	0.632	0.742
6	0.466	0.500	0.555	0.585	0.610	0.635
4	0.500	0.445	0.500	0.500	0.600	0.619
1	0.331	0.415	0.500	0.500	0.538	0.644
5	0.368	0.390	0.400	0.462	0.500	0.559
3	0.276	0.365	0.381	0.356	0.441	0.500
Sum p[b]	2.441	2.649	2.836	3.072	3.321	3.681
Final scale values	1.000	1.093	1.172	1.273	1.378	1.535

[a] Refers to Phase I objectives identified in the methods section.
[b] Summation of the proportion of times column objective i was selected over row objective j.

A person may sometimes be inconsistent when making PC judgments. An inconsistency would occur whenever there is a circular triad present in the n(n-1)/2 judgments. *One* circular triad would occur if objective 1 was judged more important than objective 2, objective 2 was judged more important than objective 3, *but* objective 3 was judged more important than objective 1. Inconsistency in making judgments increases as the number of circular triads in a set of n(n-1)/2 comparative judgments increases. To provide an indication of the degree to which enforcement personnel were consistent in their comparisons, Kendall's (1948) coefficient of consistence (zeta) was calculated for each of the set of comparative judgments by 10 randomly-selected respondents. The calculated zeta for the 10 judges ranged from 0.75 to 1.00 ($P<0.06$), suggesting that respondents on the average were very consistent in making PC judgments.

Although each rater may have a coefficient of consistence of 1.00 for the comparative judgments of a set of objective stimuli, raters may not agree in the judgments they have made. Kendall's coefficient of agreement (u) was computed for the judgments of the 118 respondents to determine the extent to which all judges agreed in the judgments. The calculated value of u of 0.04 from the warden-judged objectives was significant at $P<0.01$ ($X^2=90.82, df=15$) and indicates a certain amount of agreement among the judges. It appears that, *overall*, enforcement personnel were consistent in their PC judgments.

In addition to obtaining scale values for objectives for all individuals combined, a scale value for each of the objectives was derived by the PC method for 3 subgroups: (1) officers (n=75), (2) sergeants (n=22), and (3) personnel with a rank of lieutenant or above (n=21 and hereafter referred to as "lieutenant+"). Table 2 presents the rank order of importance of objectives for all individuals combined and for the 3 subgroups.

The rank order of importance of objectives for each of the 3 subgroups indicates both agreement and disagreement concerning the relative importance of objectives.

There is a relatively high degree of agreement between sergeants and lieutenants+ in their comparative rankings of objectives (Spearman's rho=0.714). However, there is almost no correlation between rankings of officers and sergeants (rho=0.086) and a moderate *negative* correlation between rankings of officers and lieutenants+ (rho=-0.314). The rho of -0.314 between officers and lieutenants+ indicates that objectives ranked high by officers tend to be ranked low by lieutenants+. The finding of a small positive (0.086) and a negative (-0.314) correlation appears contrary to the significant ($P<0.01$) u which indicated a certain amount of agreement among the judges.

Violation Seriousness Scores

Enforcement objectives employed in Phase II were:

1) To assure that a desired level of resource use is obtained.

2) To attempt to distribute resource use or consumption equally among users.

3) To protect public and private property from physical harm as a result of resource use.

4) To protect participating resource users from physical harm.

5) To insure agency income by requiring users to pay for resource use.

6) Combined division objectives ("Other")

The objective importance score for the "Other" objective (number 6) was computed by averaging importance scores for the first 5 objectives.

Objective 6 received the most number of law associations (29). However, 19 of the 29 associations were by default due to a less than 50% concensus for other objectives in Phase I. Objectives 1, 2, 3, 4, and 5 received 14, 9, 5, 13, and 23 law associations, respectively. The mean percent agreement among subjects that a law should be associated with an objective ranged from a low of 56.80 for laws associated with objective 2 to 85.09 for laws associated with objective 6.

Laws associated with objective 1 were related to hunting after legal hours, during closed seasons, or in an illegal manner. Associated with objective 2 were laws pertaining to detaching a game tag, destroying evidence of sex, and exceeding size or bag limits. Trespass and litter laws were exclusively associated with objective 3. The 13 laws with a perceived major purpose of protecting participating resource users from physical harm (objective 4) were related to required boating safety equipment and safe boat operation procedures. Objective 5 received almost twice the number of law associations as its nearest competitor.

Table 2. Rank order of importance of objectives for all individuals combined and subgroups consisting of a) officers, b) sergeants, and c) lieutenants, captains, majors, and colonel[a].

| Group | Objectives[b] | | | | | |
	2	6	4	1	5	3
All individuals	6	5	4	3	2	1
Officers	5	6	3	4	2	1
Sergeants	4	3	6	2	˙5	1
Lieutenants+[c]	5	1	6	2	4	3

[a] Cell values represent the rank of the order of importance of each objective. The rank order of 1 to 6 ranges from highest in importance (1) to lowest in importance (6).

[b] Refers to the Phase I objectives presented in the methods section.

[c] Consists of lieutenants, captains, majors, and colonel.

Seriousness impact mean scores (raw scale) ranged from 2.58 ("It is unlawful to fish on Sundays in certain counties") to 10.46 ("It is illegal to make a false statement when applying for a hunting license"). Violations involving hunting or fishing without a license, purchasing an improper license, and making a false statement when appplying for a hunting or fishing license were perceived as having the most serious effect on achievement of the associated objective.

An objective-weighted seriousness score was computed for each law by 1) multiplying the arithmetic mean seriousness score of a law by the importance weight assigned the associated objective, 2) transforming the product to a standard score (mean=0, standard deviation=1), and 3) transforming the standard score to a t-score (mean=50, standard deviation=10) to eliminate negative values.

Table 3 presents mean seriousness t-scores and the average of mean raw-scale seriousness scores of laws associated with the 6 objectives.

The average of raw scale mean seriousness scores of laws associated with a particular objective was very close for objectives 1 through 5 (range=0.472) but non-specific objective 6 diverged noticeably. Mean seriousness t-scores associated with the objectives evidenced a much wider range (20.46) due to the standard deviation transformation value and incorporation of objective importance values in calculation of t-scores. The average of the t-scores for objective 3 was noticeably larger than for the other objectives.

Table 3. Mean objective-weighted seriousness t-scores and the average of raw-scale mean seriousness scores for laws associated with objectives.

Objective[a]	Mean of t-scores[b]	Average of raw-scale mean seriousness scores[c]
1	53.92	8.024
2	44.87	8.373
3	65.33	8.402
4	52.52	8.470
5	52.65	8.496
6	46.40	7.018

[a] Refers to Phase II objectives presented in the results section.
[b] Calculated by summing the t-scores of laws associated with an objective and dividing by the number of t-scores.
[c] Calculated by summing the raw-scale mean seriousness scores of laws associated with an objective and dividing by the number of mean scores.

DISCUSSION

Scaling of Objectives

We earlier noted that a small positive (0.086) and a negative (-0.314) correlation appeared contrary to the significant ($P < 0.01$) u which indicated a certain amount of agreement among the judges. A possible explanation for the apparent contradiction is that the officer group is 3 times larger than either the sergeant or lieutenant+ group and high agreement among the officers may have strongly contributed to the positive u statistic. In other words, the positive u may be an artifact of the marginals. An important difference to note is that the scaling of objectives indicated objective 6 was *least* important while lieutenants+ indicated it was *most* important. Also, officers and sergeants felt objective 3 was most important while lieutenants+ felt it was third in importance.

An implicit primary objective of private industry is maximization of profits. Although industry has sub-objectives concerning efficiency, effectiveness, productivity, and performance, it is probable that employees are knowledgeable of the common goal (profits) to which they are to direct their business-related activities. However, as suggested by the results of objectives scaling by the 3 subgroups of wildlife law enforcement personnel, enforcement divisions without importance-valued, explicit, measurable objectives may have personnel placing different emphasis on achieving elements of a set of objectives or even on different objectives. Officers felt the most important of the 6 presented objectives was to protect public and private property from physical harm as a result of resource use. Officers are almost exclusively field-oriented and spend much of their time patrolling their assigned county. Officers may have chosen this objective as being much more important relative to others presented because they are responsible for responding to landowner complaints of vandalism and trespass by sportsmen. On the other hand, lieutenants+ are primarily 'office-oriented" (not necessarily by choice) and seldom conduct the activities reserved for officers. Being more administratively oriented, higher-ranked personnel tended to select as most important the objective that in the long-run might have the greatest effect on divisioin functioning (i.e., revenue).

One result of this paper is to underscore the differences in perception of importance of enforcement division objectives, to indicate how these differences can be quantified and tested, and to develop a scale along which the importance of objectives can be classified. Objectives can be scaled with input from all program levels. Results should be reported to all levels to improve coordination of efforts and efficiency in allocating scarce agency resources. The danger of not having importance-valued objectives is especially suggested by the rank order of importance of objective 6 (of the Phase I objectives) by the 3 subgroups. Objective 6 was valued as *least* important of those presented by officers, *most* important by lieutenants+, and *intermediate* (third), in importance by sergeants.

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We do not suggest that individuals within each hierarchial level of an enforcement division should work at the same rate toward achievement of 1 or more objectives. However, obtaining an acceptable level of overt agreement among personnel would allow scheduling of activities at all levels to optimize a set of value-weighted objectives.

Violation Seriousness

We originally computed an importance value for the objective "To protect non-resource users from physical harm as a result of resource use activity" but discarded the objective prior to Phase II because there was no concensus on laws that were associated with the objective. A reason for this lack of concensus was not intuitive since this objective was next to largest in absolute value of the original 6 objectives (not including "Other"). Protecting non-resource users from physical harm as a result of resource use may be a valid first-order enforcement objective but may not require the degree of law enactment necessary to achieve other objectives. Also, laws established to achieve this objective may not have been violated, or if violated, not detected between 1 July 1973 and 30 June 1976, and thus would not have occurred in the list of laws presented to personnel for objective association. Another possible explanation may be that 1 or more laws presented to raters for evaluation may contribute to achievement of this objective but were not perceived by 50% or more of the raters as having the *primary* purpose of achieving this objective.

We initially considered the idea of developing a seriousness score for a single violation of a wildlife of natural resource law, as opposed to the stimulus "violations in your district." This would have allowed comparison of the perceived seriousness of a single violation of different laws; would have theoretically minimized the potential response bias due to local conditions; and, would have been beneficial in allocating and deploying enforcement manpower at a point in the future when violation frequency estimation methodologies become more sophisticated. It may be possible to acquire subjective perceptions from individuals of the *intrinsic* seriousness of 1 criminal event (e.g. murder, burglary, rape), such as done by Sellin and Wolfgang (1964,) because many actions processed under criminal law are *mala in se*, or evil of and in themselves. However, violations of wildlife laws are *mala prohibita* ("evil" because they are forbidden) and it is difficult, if not impossible, to think in terms of the moralness-immoralness of a wildlife violation. Also, if we had attempted to acquire perceptions of the seriousness impact of 1 violation of a law on the achievement of a objective, the range of seriousness impact scores would have probably been greatly restricted (e.g. 1-3) because 1 violation of any wildlife law should have only a negligible effect on objective achievement. Therefore, we adopted the strategy of asking enforcement personnel about their perceptions of the seriousness of current levels of specific violations in their enforcement district. Some individuals may have been very unfamiliar with the violation situation in other districts and to question them about the seriousness of violations of a law throughout the state might have produced misleading results.

There are some indications that providing instructions to personnel to respond to the seriousness of violations of a law in their district resulted in district effects on perceptions of violation seriousness. A 2-way, generalized, fixed-effect model analysis of variance (district x rank) was applied to the seriousness score distribution of each of the 93 laws. There were 6 districts and 4 ranks considered in the ANOVA model (the 2 majors and the colonel were not included because of their small rank-group size). Tests on all 93 laws resulted in 3 significant ($P < 0.05$) interactions, 2 significant ($P < 0.05$) rank effects, and 16 significant ($P < 0.05$) district effects.

Future efforts to develop seriousness scores for violations in relation to impact on an objective should consider other scaling procedures in addition to the rating scale used here. Several individuals in Phase II checked seriousness category 11 ("VERY SERIOUS") for more than 90 percent of the 93 laws.

Sellin and Wolfgang (1964) experimentally tested 2 procedures for developing seriousness scores for criminal offenses. The 2 procedures tested were an equal-interval 11-point category scale and a magnitude estimation technique (MET). The MET involves the investigator assigning a seriousness score (say 10) randomly to 1 law and requesting subjects to judge the seriousness of the other laws in relation to the reference law. For example, if violation of 1 law was perceived as being twice as serious as violation of the reference law, it would receive a score of 20. Theoretically, a magnitude estimation scale has no established or assigned upper limit and any number greater than 0 can be used as the lower limit. In contrast, the 11-point category scale has an upper limit of

11, forces judgments within the 11-point range, and will probably not be as "sensitive" as the MET because of limited discriminatory points. Sellin and Wolfgang (1964) suggested that the MET be used instead of the 11-point category scale because of the greater freedom in range of possible responses available with the MET. However, one disadvantage of the MET is that a revision phase may be necessary. According to Chambers et al. (1967:43), "It is the lack of the revision phase . . . that seems to be a really critical deficiency of the Sellin and Wolfgang method." We considered applying the MET to violation seriousness scaling but opted for the category rating scale when we discovered it would be very difficult to develop essentially equivalent reference laws among the 6 objectives.

We have presented a 2-page procedure whereby it is possible to acquire subjective evaluations from professional law enforcement personnel of the relative importance of especified objectives and the seriousness of violations of wildlife and natural resource laws in relation to detrimental impact on achievement of enforcement objectives. Refinements and extensions of the methodology should serve to facilitate the accomplishment of the objectives set forth in the introduction.

LITERATURE CITED

Beattie, K. H., C. J. Cowles, and R. H. Giles, Jr. 1977. Objectives of state wildlife law enforcement divisions. Proc. Southeastern Assoc. Fish and Wildlife Agencies 31: 709-716.

Chambers, M. L., W. B. Arthur, J. G. Leigh, and P. P. Sutton. 1967. Survey of police operations and evaluation of their effectiveness. Univ. Lancaster, England. 125pp.

Edwards, A. L. 1957. Techniques of attitude scale construction. Prentice-Hall, Englewood Cliffs, N.J. 256pp.

Evans, R., H. Vonbarby, D. Benson, J. Gerrans, A. Gresh, J. Hogue, D. Norman, M. Stone, D. Weyerman, and D. Lashnits. 1975. Report of the task force on law enforcement. Colorado Div. Wildl. 81pp.

Kendall, M. G. 1948. Rank correlation methods. Griffin, London. 161pp.

Nie, N. H., C. H. Hull, J. G. Jenkins, K. Steinbrenner, and D. H. Bent. 1975. Statistical package for the social sciences. McGraw Hill, New York, N.Y. 675pp.

Pease, K., J. Ireson, S. Billingham, and J. Thorpe. 1977. The development of a scale of offense seriousness. Int. J. Crim. and Pen. 5(1):17.29.

Ritter, A. F. 1975. Objectives and performance criteria for state wildlife law enforcement agencies. M.S. Thesis. Virginia Polytechnic Institute and State Univ., Blacksburg. 171pp.

Sellin, T., and Wolfgang. 1964. The measurement of delinquency. Wiley and Sons New York, N.Y. 423pp.

Thurstone, L. L. 1927. The method of paired comparisons for social values. J. Abnorm. Soc. Psych. 21 (3):384-400.