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INTRODUCTION

Today's wildlife professionals recognize that wildlife management involves the collection of two key types of information. One type is biological and ecological data on populations and habitat conditions. The other type is evaluations of the public's expectations and concerns (Witter and Sheriff 1987). "Human dimensions of wildlife management" is a phrase that applies to the wide variety of management decisions that must take into consideration the needs of people who use wildlife or other natural resources (Decker et al. 1989). Information obtained when asking resource users directly about their attitudes, ideas, concerns, and participation, can help managers recognize and defuse existing or potential conflicts (Peyton 1989; Decker et al. 1985a, 1985b, 1981; Heberlein 1978; Smolka Jr. and Decker 1985). This information is also useful in assessing attitudes toward existing or proposed policies (Reiling et al. 1991a, 1991b; Teisl et al. 1991; Connelly et al. 1989; Decker et al. 1983; Beattie 1981; Dahlgren et al. 1977; Eisle 1973; Klessig and Hunt 1973).

In recent years, the Maine Department of Inland Fisheries and Wildlife (IF&W) has implemented several changes in hunting regulations to counter a steady increase in the harvest of Maine's black bears (*Ursus americanus*). These include several changes made during the early 1980s and a number of major changes that started with the 1990 hunt. The research reported in this paper considers hunters' opinions regarding current and proposed hunting regulations for black bears in Maine.

BEAR HUNTING IN MAINE

One of the few large game animals available to hunters in the Northeast, Maine's black bears have become a much-sought-after big game animal by both residents and nonresidents. This desirability can be measured in monetary terms as consumer surplus which is a measure of the satisfaction an individual receives from an activity (Boyle et al. 1988). Consumer surplus for Maine bear hunting in 1988 was $140 for resident bear hunters and $329 for nonresident bear hunters. Of the big game species hunted in Maine, moose has the highest consumer surplus per hunter, $818 for residents and $1221 for nonresidents, followed by deer ($294 and $445), then bear (Boyle et al. 1990). The difference between the surplus values for deer hunting and moose hunting may illustrate the relative value of each hunting experience: two eastern states

allow moose hunting and more than 90% of moose hunters kill a moose, whereas many states allow deer hunting and only 22% of residents and 25% of nonresidents kill a deer. Among bear hunters, only 12% of residents and 26% of nonresidents killed a bear in 1988. The deer hunt has the highest aggregate consumer surplus ($58,362,100) determined by multiplying the average annual consumer surplus value by the total number of hunters, followed by the bear hunt ($5,527,375), and the moose hunt ($853,392).

The black bear hunt also has a substantial impact on Maine's economy with resident and nonresident bear hunters spending a total of $6.4 million in 1988, $2.9 million and $3.5 million respectively (Reiling et al. 1991a). Annual expenditures per hunter are highest for the moose hunt, followed by the bear hunt, and deer hunt for both residents and nonresidents. Multiplying average annual expenditures per hunter by the total number of hunters for each sport, however, shows that deer hunters contribute the most to the economy, followed by bear hunters, and then moose hunters (Boyle et al. 1990).

Careful monitoring and periodic assessments of Maine's bear population are necessary to ensure reasonable harvest goals and the maintenance of a quality hunting experience. During the 1950s, Maine's bear population was estimated to be between 4200 and 4900 animals and growing (McLaughlin and Matula 1985). A reassessment in the 1970s estimated the population at 6000 to 9000 animals. It was determined that this population could support an annual harvest of between 720 and 1350 animals. The management goal from 1975 to 1985 was to maintain the bear population at pre-1974 levels and to provide for an annual harvest of 800 to 1000 bears. Between 1975 and 1984, however, harvest levels exceeded 1000 individuals for 7 of 10 years (McLaughlin 1986). Harvest levels peaked at 1630 bears in 1979 (McLaughlin and Matula 1985). The trend in increasing harvest led to several changes in bear-hunting regulations in the early 1980s. These actions included shortening the 1980 season, a 1981 split between spring and fall seasons, and the introduction of a fall only season in 1982.

In 1984, IF&W used new data on cub production, mortality, and population densities, as well as an increased knowledge of bear behavior, to reestimate Maine's black bear population. New population estimates placed the number of black bears at twice pre-1980 estimates, or 18,000 bears (McLaughlin and Matula 1985). Despite the larger population estimate, steadily increasing harvest rates since 1982 (Table 1), exceeding IF&W's revised harvest objective of 2500 bears in both 1988 and 1989 (Elowe and McLaughlin 1990), again led to concern for the bear population and prompted changes

in the 1990 bear-hunting regulations (McLaughlin et al. 1990). In 1990 the Commissioner shortened the open season by 4 weeks (Maine Fish and Wildlife Magazine, Winter, 1989–1990). Along with the shorter season, came several other changes.

Prior to 1990, the set-bait and hound seasons overlapped for most of the season. To reduce conflicts between hunters who use hounds and those who do not, the set-bait season was separated from the hound season and ran for the first 4 weeks of the season with a 1-week overlap with the hound season. The hound season was limited to 6 weeks and ran from mid-September through October. Limiting the use of bait is significant because the largest number of hunters hunt over bait, and these hunters accounted for 64% of the harvest in 1989 (Elowe and McLaughlin 1990). The 1990 bear-hunting season was the first time IF&W used hunting method as a way to divide the season.

Another change at this time was the introduction of a low-cost bear-hunting permit which was required in addition to the big game hunting license in order to hunt bear prior to the November deer season. The new permit helped managers determine the bear-hunting effort and success rates before the deer season (McLaughlin et al. 1990).

Table 1. Annual harvest rates of Maine black bear from 1975 to 1992.

YEAR	HARVEST
1975	959
1976	1008
1977	1066
1978	1320
1979	1630
1980	1058
1981	1001
1982	1221
1983	1412
1984	1595
1985	1544
1986	1955
1987	2394
1988	2673
1989	2690
1990	2088
1991	1665
1992	2042

Taken one at a time, the changes in bear-hunting regulations since 1980 appear minor and reasonable. Collectively, however, these changes have substantially altered the bear-hunting season. The reasons for these changes are clear, to create and maintain a healthy bear population which can support desirable bear-hunting experiences. The research reported in this bulletin investigates how hunters evaluate these changes in bear-hunting regulations. These evaluations are particularly important in the management of bear since resident bear hunters are a vocal constituency with significant opportunities to influence bear management decisions.

Other studies have also asked hunters to evaluate hunting policies and regulations (Connelly et al. 1989; Heberlein and Klepinger 1984; Decker et al. 1983; Heberlein 1978; Heberlein and Laybourne 1978; Eisle 1973; Klessig and Hunt 1973). Several recent studies in Maine have focused on bear hunting in particular. Maine bear hunters have been surveyed about their attitudes/opinions on season timing issues (Teisl et al. 1991). Reiling et al. (1991a, 1991b) analyzed characteristics of bear hunters, expenditures, hunting effort, and opinions about policy issues such as the use of artificial baits and methods to reduce the harvest of bears.

A report by Boyle et al. (1990) documented the positive and negative attributes associated with bear hunting as cited by bear hunters. One of the most commonly mentioned negative attributes was the use of dogs and the resulting conflicts with other hunters. This issue was addressed when the 1990 season was segmented into dog-only and bait-only sections. Peyton's study (1989) of Michigan bear hunters reveals that Michigan's management problems also revolve around the conflicts between different hunting methods. A recent survey of registered voters and black bear hunters in Colorado also addresses the issues associated with various hunting methods, particularly the use of bait and dogs (Colorado Division of Wildlife 1991).

Based on the finding of the above studies, we chose not only to investigate hunter opinions regarding current and future bear hunting regulations, but also to consider differences in hunter opinions according to whether they are a resident or nonresident and by the hunting methods they used.

METHODS

In 1991, a mail survey was administered to residents and nonresidents who hunted bear in Maine during 1990. The purpose of the survey was twofold. First, the survey was designed to quantify hunter effort and success. The second part of the survey asked hunters for their opinions on bear hunting regulations. The focus of this paper is on data collected in the second part of the survey using data from the first part of the survey to analyze hunters' opinions on the regulations.

Survey Design

Initial survey questions were developed with input from IF&W. After the questions were developed, a focus group of bear hunters was used to refine the survey design. Ten local bear hunters were invited to a meeting, completed the survey, and were asked to comment on the survey questions and format. Comments from the focus group were used to refine the survey instrument. The first section of the survey was designed to elicit general information about bear hunting. These questions focused on days hunted, location hunted, use of a Registered Maine Guide, success and method of hunting. Hunting methods were divided into hunting with hounds, hunting over set bait without hounds, and hunting around natural food sources without set bait or hounds.

The second part of the survey focused on the collection of the opinion data reported here. Hunters were presented with a statement of each regulation and asked to rate the regulation on a Likert scale ranging from Strongly Disagree (-2), Probably Disagree (-1), Don't Know (0), Probably Agree (1), to Strongly Agree (2). The "Don't Know" option allowed those without strong feelings of agreement or disagreement to have a valid response option. The hunters were asked to evaluate the following regulations:

CURRENT

- Permit required before deer season.
- Hunting over set baits only from August 27 to September 15.
- Hunting with hounds only from September 22 to October 26.
- One-week overlap (Sept. 15–Sept. 22) of set-bait and hound seasons.

PROPOSED

- Restrict number of permits.
- Shorten hound season.
- Discontinue hound season.
- Shorten set-bait season.
- Discontinue set-bait season.
- Shorten entire season.

After each rating question, hunters were asked to explain why they agreed or disagreed with the specific regulation. An open-ended format was used for this question. Although the data gathered from the open-ended questions were not analyzed statistically, the tabulations of these responses provided insight as to why hunters responded to the policy questions as they did. All open-ended responses were read, sorted according to similar reasons, and assigned a numeric code. If hunters wrote two distinct reasons why they rated a policy a certain way, only the first reason was recorded. If the response involved a long, detailed story with many contributing variables, however, the broader, overall reason was recorded. Geer (1991, 1988) concluded that responses to these types of questions address salient issues and that most people respond. Therefore, the open-ended questions provide useful information despite the difficulty of analyzing the diverse responses.

The third and final section of the survey included socioeconomic questions about the hunters themselves.

Survey Implementation

A total of 11,750 persons purchased permits in 1990 to hunt bears prior to the deer season, 7136 residents and 4614 nonresidents (Personal contact with IF&W). The names and addresses of resident and nonresident bear hunters were randomly selected from a computer file of 10,267 permit holders; permits with illegible addresses were not computerized. The sample was comprised of 500 residents and 500 nonresidents. An equal stratification was used to ensure a sufficient number of nonresident responses for data analyses.

Surveys were administered according to the Dillman method (1978). All hunters received a survey and a follow-up postcard thanking them for their participation in the study and reminding them to complete and return the survey. To maximize the response rate and reduce sample-selection bias in the resulting data, a second survey was mailed to persons who did not respond within two weeks to the first survey. Hunters who did not return the second survey within two weeks received a third survey via certified mail.

RESULTS

Of 1000 surveys mailed, 733 were returned usable, 69 were undeliverable, 3 were refused, and 21 were returned stating that the person did not hunt. The overall response rate, as a percentage of deliverable surveys, was 81%. The response rates for residents and nonresidents were 76% and 84%, respectively.

Initially, data were stratified according to resident status to test the null hypothesis that resident responses were the same as nonresident responses. Previous studies (Boyle et al. 1990; Reiling et al. 1991a) indicate that resident bear hunters differ from nonresident bear hunters in Maine. For example, Reiling et al. (1991a) found nonresidents are more likely to use guides and to hunt for a shorter period of time. Nonresidents also tend to have more education and higher incomes than residents. Resident and nonresident bear hunters also have been shown to differ in their responses to policy questions (Reiling et al. 1991a, 1991b; Teisl et al. 1991).

To consider whether hunting method or other factors significantly affected hunters' responses to hunting regulation questions, the data were stratified into the following groupings.

Success—Hunters who got a bear during the 1990 season (Success) versus those who did not (NSuccess).

Natural—Hunters who hunted near natural food sources in 1990 (Natural) versus those who did not (NNatural).

Bait—Hunters who hunted over set bait in 1990 (Bait) versus those who did not (NBait).

Dog—Hunters who hunted with hounds in 1990 (Dog) versus those who did not (NDog).

Guide—Hunters who used a guide for their 1990 hunt (Guide) versus those who did not (NGuide).

Prhunt—Hunters who had hunted bear prior to 1980 (PrHunt) versus those who had not (NPrHunt).

Tests were conducted for the hypothesis that the distributions of responses to hunting regulation questions are equal for each of the stratifications, e.g., the distribution of responses to a hunting regulation questions are the same between those who hunted over set bait and those who did not.

Success and the use of a guide are two characteristics that may affect the quality of a hunt and thus influence hunters' opinions. Recent success may make hunters more amenable to the regulation

changes because they may perceive the policies as beneficial. Successful guided hunts may produce similar responses.

Natural, bait, and dog represent the methods of bear hunting and certain hunting regulations are method specific. Therefore, hunting method may influence the level of agreement with certain regulations.

Hunting experience prior to 1980 is an important split because it divides hunters into those who have hunted over the time of all regulation changes and those who are relatively new to the sport. This distinction reflects a hunter's involvement with the Maine bear hunt and perhaps knowledge of regulation changes.

Resident versus Nonresident Hunters

The majority of bear hunters are relatively new to the sport with 11% of residents and 5% of nonresidents stating that they began hunting between the years 1980 and 1984, and 61% of residents and 84% of nonresidents stating that they first began bear hunting since 1984. Nineteen percent of residents and 50% of nonresidents indicated that 1990 was their first year hunting bear in Maine.

As was found in previous studies of Maine bear hunters, characteristics of resident and nonresident hunters differ. The average resident hunter is 37 years old, has a high school education, and has a household income of $30,686 per year. The average nonresident hunter is 41 years old, has several more years of education beyond high school, and has a household income of $49,500 per year.

Resident and nonresident hunters also differ with respect to their bear-hunting characteristics (Table 2). Of those who purchased a bear-hunting permit, 78% of residents and 94% nonresidents actually hunted bear during 1990 prior to the deer season. Bear-hunting permits were first required of hunters wishing to hunt bear prior to the deer season in 1990. Nonresidents come to Maine specifically to hunt bear during the bear season. Residents may have thought, however, that the permit was necessary even for a bear during the deer season and may have purchased a permit even though they didn't use it during the bear season. This may explain the lower response rate for residents to the survey.

In 1990, residents hunted an average of 9 days and 12% killed a bear, whereas nonresidents hunted an average of 5.5 days and 35% were successful. This difference in success rate is likely due to nonresident hunters being significantly more likely to hunt with a guide and over set bait.

Table 2. Descriptive statistics (%) for variables used to stratify responses to policy questions.

Question	Residents	Nonresidents	All Hunters[a]
Hunt bear during 1990?	78	94	84
Success	12	35	22
Number of days hunted (Mean)	9.2	5.5	7.6
Use a guide?	6	64	25
Hunt over set bait?	60	82	70
Hunt near natural food sources?	49	14	34
Hunt with hounds?	14[b]	10[b]	12
Hunt bear prior to 1980?	19	11	16
Ever contact IF&W?	9	3	7

[a] Combined results are weighted to reflect the numbers of resident and nonresident bear hunters.

[b] Statistics sharing a common superscript are not significantly different at the 10% level.

Hunting over set bait is the most popular hunting method for both residents and nonresidents, 60% and 82%, respectively. More resident hunters (49%) than nonresident hunters (14%) stated that they hunt near natural food sources as a method of hunting. Hunting with hounds is the least common method of hunting. Only 14% of residents and 10% of nonresidents stated that they used this method in the 1990 bear season, and this is the only variable where resident and nonresident characteristics are not significantly different.

Given the differences in resident and nonresident bear hunters identified here, subsequent analyses are stratified according to whether or not respondents are residents of Maine.

Evaluations of Hunting Regulations

Resident and nonresident hunters' evaluations of current regulations are shown in Table 3. Residents approved of the set-bait season and disapproved of the hound-only season and the one-week overlap. Residents were evenly split on the bear-hunting permit. Nonresidents approved of the permit required to hunt bear prior to the deer season and the set-bait season, but disapproved of the overlap between hound-hunting and set-bait seasons. They were evenly divided with respect to the hound-only season.

Table 3. Hunters' evaluations of current bear hunting regulations.

Regulations		LEVEL OF AGREEMENT: Strongly Disagree	Probably Disagree	Probably Agree	Strongly Agree	% Agree	n	x^2
		%						
1990—Permit	Res[a]	43	8	17	33	50[b]	292	
required before	NRes	27	9	25	40	64	305	
deer season.	Comb	37	8	20	35	55		17.4***[c] (0.00)[d]
1990—Hunting over	Res	34	11	25	31	55	279	
set baits *only* from	NRes	22	13	27	37	65	308	
Aug. 27 to Sept. 15.	Comb	30	12	26	33	59		10.1** (0.02)
1990—Hunting with	Res	48	11	20	21	41	263	
hounds *only* from	NRes	40	12	24	24	48[b]	273	
Sept. 22 to Oct. 26	Comb	45	11	22	22	44		3.5 (0.32)
1990—One week	Res	48	16	25	11	36	225	
overlap (Sept.15–	NRes	45	19	18	17	35	242	
Sept.22) of set bait	Comb	47	17	22	13	36		6.5* (0.09)
and hound seasons.								

[a] Res, NRes, and Comb denote residents, nonresidents, and combined responses (weighted averages of resident and nonresident responses).
[b] Proportions with this superscript are not significantly different from 0.50 ($\alpha = 0.10$).
[c] Asterisks denote significant differences in resident and nonresident distributions of responses at the following levels: * $p \leq .10$; ** $p \leq .05$; *** $p \leq .01$.
[d] p values.

Table 4. Hunters' evaluations of potential bear hunting regulations.

Regulations		LEVEL OF AGREEMENT: Strongly Disagree	Probably Disagree	Probably Agree	Strongly Agree	% Agree	n	x^2
		%						
Restrict number of permits.	Res[a]	55	9	17	19	35	279	
	NRes	36	12	27	26	52[b]	307	
	Comb	48	10	20	22	42		22.9***[c] (0.00)[d]
Shorten hound season.	Res	21	8	16	55	71	269	
	NRes	20	10	17	53	70	281	
	Comb	21	9	16	55	71		1.2 (0.76)
Discontinue hound season.	Res	35	16	7	42	49[b]	273	
	NRes	42	15	7	37	44	288	
	Comb	38	15	7	40	47		2.8 (0.42)
Shorten set bait season.	Res	42	13	16	28	44	261	
	NRes	44	23	21	13	33	282	
	Comb	43	17	18	23	40		24.6*** (0.00)
Discontinue set bait season.	Res	65	12	6	17	23	267	
	NRes	72	16	6	6	12	301	
	Comb	67	14	6	13	19		19.1*** (0.00)
Shorten entire season.	Res	41	13	24	22	47[b]	276	
	NRes	33	21	30	17	46[b]	296	
	Comb	38	16	26	20	47		10.3** (0.02)

[a] Res, NRes, and Comb denotes residents, nonresidents, and combined responses (weighted averages of resident and nonresident responses).

[b] Proportions with this superscript are not significantly different from 0.50 ($\alpha = 0.10$).

[c] Asterisks denote significant differences in resident and nonresident distributions of responses at the following levels: * $p \leq .10$; ** $p \leq .05$; *** $p \leq .01$.

[d] P values.

With regard to future policies to reduce the bear harvest, resident hunters agreed only with the policy to shorten the hound season, and they opposed restricting the number of permits, shortening the bait season, and discontinuing the bait season (Table 4). Nonresidents also approved of shortening the hound season, but disagreed with discontinuing the hound season. Nonresidents disagreed with changes in hunting over bait.

These findings are suggestive of the results of stratifying the data by hunting method. Since most bear hunters hunt over set bait, they oppose changes in regulations concerning the use of bait and are more amenable to changes in regulations concerning the use of hounds. Hunters who use hounds hold the opposite opinions, but their opinions are not reflected in the aggregate statistics due to their small numbers.

ANALYSES OF DATA STRATIFICATIONS

Success

Bear-hunting success in 1990 had no effect on how resident hunters evaluated either the current or proposed regulations (Table 5). Success had an impact on how nonresident hunters evaluated the 1990 one-week overlap between the dog and bait seasons and the proposal to discontinue the set-bait season. Although both successful and unsuccessful hunters disagreed with both of these regulations, unsuccessful hunters on average were more opposed to the one-week overlap and less opposed to discontinuing the set-bait season.

Natural

The use of natural food sources as a hunting method had a significant effect on how resident hunters responded to the set-bait-only season and discontinuing the set-bait season (Table 6). Those who hunted near natural food sources disagreed with the set-bait-only regulation on average, while those who used other methods tended to approve of the set-bait season. These results are explained by the fact that hunters can only hunt over natural bait during the set-bait season, so their season was also shortened. In addition, persons who hunt over natural bait may feel that the set-bait season restricted their hunting time or interfered with their hunt since those who use bait often set their bait near natural food sources and are more successful at getting a bear. Both groups disagreed with the regulation to discontinue the set-bait season, but those who do not hunt over natural food sources expressed stronger disagreement with this policy.

Table 5. Differences in evaluations of regulations according to whether respondents got a bear during the 1990 season.

Regulations	Residents			Nonresidents		
	Chi-square	Mean Scores[a] Success	NSuccess	Chi-square	Mean Scores Success	NSuccess
Current						
1990—Permit required before deer season.	1.41	-0.3	0.0	1.41	0.5	0.4
1990—Set baits only, Aug. 27 to Sept. 15.	1.47	0.4	0.2	2.26	0.6	0.4
1990—Hounds only, Sept. 22 to Oct. 26.	2.86	-0.3	-0.4	4.94	0.0	-0.2
1990—1-week overlap (Sept.15–Sept.22), set bait and hounds.	2.87	-0.7	-0.6	7.75**[b]	-0.2	-0.8
Proposed						
Restrict number of permits.	5.11	-0.9	-0.7	1.93	0.1	-0.1
Shorten hound season.	1.91	0.3	0.7	3.56	0.6	0.9
Discontinue hound season.	3.49	-0.4	0.0	3.44	-0.4	0.0
Shorten set bait season.	1.81	-0.2	-0.4	0.03	-0.7	-0.7
Discontinue set bait season.	0.63	-1.2	-1.2	7.35*	-1.6	-1.3
Shorten entire season.	1.56	-0.2	-0.4	2.63	-0.2	-0.3

[a] Mean scores were computed by assigning values of -2, -1, 1 and 2 to response of "strongly disagree," "somewhat disagree," "probably agree," and "strongly agree," respectively.

[b] Asterisks denote significance between distributions of responses at the following levels: * $p \leq .10$; ** $p \leq .05$; *** $p \leq .01$

Table 6. Differences in evaluations of regulations according to whether respondents hunted near natural food sources.

Regulations	Residents			Nonresidents		
	Chi-square	Mean Scores[a] Natural	Mean Scores[a] NNatural	Chi-square	Mean Scores Natural	Mean Scores NNatural
Current						
1990—Permit required before deer season.	1.60	-0.2	-0.1	2.21	0.1	0.5
1990—Set baits only, Aug. 27 to Sept. 15.	12.95***[b]	-0.2	0.5	14.95***	-0.1	0.6
1990—Hounds only, Sept. 22 to Oct. 26.	3.72	-0.5	-0.3	4.31	-0.6	-0.1
1990—1-week overlap (Sept. 15–Sept.22), set bait and hounds.	4.34	-0.7	-0.5	5.99	-1.1	-0.5
Proposed						
Restrict number of permits.	2.79	-0.6	-0.9	14.05***	-0.9	0.1
Shorten hound season.	0.28	0.7	0.7	1.12	1.0	0.7
Discontinue hound season.	0.81	0.1	-0.1	4.12	0.3	-0.3
Shorten set bait season.	5.70	-0.1	-0.6	22.84***	-0.3	-0.2
Discontinue set bait season.	11.72***	-0.7	-1.4	39.86***	-0.5	-1.6
Shorten entire season.	4.03	-0.6	-0.2	1.52	-0.3	-0.2

[a] Mean scores were computed by assigning values of -2, -1, 1 and 2 to response of "strongly disagree," "somewhat disagree," "probably agree," and "strongly agree," respectively.

[b] Asterisks denote significance between distributions of responses at the following levels: * $p \leq .10$; ** $p \leq .05$; *** $p \leq .01$

Hunting over natural baits was more likely to affect how nonresidents evaluated the regulations. Hunting over natural food source significantly affected nonresidents evaluations of the current set-bait-only season and the proposed regulations to restrict the number of permits and to shorten or of discontinue the set-bait season. Those who hunted over natural food sources were more likely to oppose the set-bait season and the regulation to restrict the number of permits. Those who hunted over natural baits were less likely to disapprove of discontinuing the set-bait season. Despite the significant statistical difference in the distributions of responses, the two groups of nonresidents exhibited about the same mean level of disagreement, on average, with the regulation to shorten the set-bait season.

For the two regulations with significant differences for residents, the pattern of responses are the same as for those of nonresidents

Bait

For residents the split between those who hunted over set baits and those who did not affected evaluations of regulations related to set-bait hunting. Among current regulations, hunters who set bait agreed with the 1990 bait-only season, while hunters who did not set bait disagreed (Table 7). Hunters who set bait also disagreed with regulations shortening or discontinuing the set-bait season, strongly disagreeing with the latter.

The effect of the bait hunt split was similar for nonresidents with one exception; the difference of opinion regarding the proposal to restrict number of permits was also significant for the two groups.

Hounds

The split between hunters who used hounds and those who did not significantly affected opinions on one current hunting regulation and four of the six proposed regulations. Each of these regulations indirectly affect the use of hounds. Among residents, hunters who use hounds were neutral about a one-week overlap of bait and hound seasons, while hunters who do not use hounds disagreed with this regulation (Table 8). Hunters who use hounds strongly disagreed with proposals to shorten or discontinue the hound season, and disagreed with regulations to discontinue hunting with bait or to shorten the entire season. It is possible that some hunters who use hounds disagreed with discontinuing the bait season because they use bait to start their dogs and believe other hunters should have some access, perhaps limited, to their desired hunting method (set bait).

Table 7. Differences in evaluations of regulations according to whether respondents hunted over set-bait.

Regulations	Residents			Nonresidents		
	Chi-square	Mean Scores[a] Bait	NBait	Chi-square	Mean Scores Bait	NBait
Current						
1990—Permit required before deer season.	2.33	-0.1	-0.2	0.24	0.4	0.5
1990—Set baits only, Aug. 27 to Sept. 15.	13.64**[b]	0.5	-0.4	9.79**	0.6	-0.1
1990—Hounds only, Sept. 22 to Oct. 26.	6.54*	-0.3	-0.5	6.07*	-0.1	-0.4
1990—1-week overlap (Sept. 15–Sept. 22), set bait and hounds.	2.02	-0.6	-0.7	1.05	-0.5	-0.7
Proposed						
Restrict number of permits.	1.05	-0.7	-0.7	6.57*	0.1	-0.5
Shorten hound season.	0.59	0.7	0.6	3.69	0.8	0.4
Discontinue hound season.	4.78	0.0	0.0	3.44	-0.1	-0.4
Shorten set bait season.	20.53***	-0.8	0.3	29.70***	-0.9	0.3
Discontinue set bait season.	34.88***	-1.6	-0.3	31.27***	-1.6	-0.7
Shorten entire season.	5.09	-0.4	-0.4	3.09	-0.2	-0.4

[a] Mean scores were computed by assigning values of -2, -1, 1 and 2 to response of "strongly disagree," "somewhat disagree," "probably agree," and "strongly agree," respectively.

[b] Asterisks denote significance between distributions of responses at the following levels: * $p \leq .10$; ** $p \leq .05$; *** $p \leq .01$

The split between use of hounds resulted in significant differences in nonresident evaluations of the set-bait and hound-only seasons (Table 8). Hunters who use hounds showed a slight disapproval of the bait-only season and slight approval of the hound-only season. Among proposed regulations, hunters who use hounds were more likely to disagree with the proposals to restrict the number of permits and to regulate using dogs, but were less likely to disagree with the proposal to shorten the set-bait season.

Guide

The use of a guide did not significantly influence how resident hunters responded to any of the current or proposed regulations (Table 9). This is not surprising since only 6% of resident bear hunters use a guide, and this subsample may have been too small to establish statistical significance.

The use of a guide did influence how nonresident hunters evaluated the regulations. The use of a guide significantly affected evaluations of all of the current regulations and four of six proposed regulations. Guided hunters agreed with the permits and bait-only season, were equally split regarding the season overlap, and disagreed with the hound-only season. With respect to proposed regulations, nonresidents who used a guide were less likely to agree with the proposal to shorten the hound season and more likely to disagree with proposals to change bait hunting and discontinue the hound season. These results seem to indicate that although the majority of these hunters use bait, they believe other hunters should have the opportunity to use hounds.

Prior Hunt

Hunting prior to 1980 had a significant effect on how residents responded to the regulation requiring a permit and the bait-only season (Table 10). Hunters with hunting experience prior to 1980 disagreed with the regulation requiring a permit and the set-bait season. Hunters who began hunting after 1980 approved of both these regulations. Among the proposed policies, only the policies related to hunting with hounds were significantly affected by the split between hunters who had hunted before 1980 and those who had not.

Among nonresident hunters, the bait-only season evaluations were affected by prior hunting experience. Those who had hunted before 1980 disagreed with the season, while those who had not approved of it. The same pattern was true for residents. Among future regulations the experience hunting before 1980 significantly

Table 8. Differences in evaluations of regulations according to whether respondents hunted with hounds.

Regulations	Residents Chi-square	Residents Mean Scores[a] Dog	Residents Mean Scores[a] NDog	Nonresidents Chi-square	Nonresidents Mean Scores Dog	Nonresidents Mean Scores NDog
Current						
1990—Permit required before deer season.	4.26	-0.6	0.0	2.65	0.9	0.4
1990—Set baits only, Aug. 27 to Sept. 15.	1.57	-0.1	0.2	8.09**	-0.2	0.5
1990—Hounds only, Sept. 22 to Oct. 26.	5.75	0.1	-0.5	14.87***	0.1	-0.2
1990—1-week overlap (Sept.15–Sept.22), set bait and hounds.	9.41**[b]	0.0	-0.7	5.99	-0.1	-0.6
Proposed						
Restrict number of permits.	1.98	-1.1	-0.7	6.52*	-0.6	0.0
Shorten hound season.	61.70***	-1.4	1.0	37.86***	-0.8	0.9
Discontinue hound season.	44.85***	-1.7	0.3	25.69***	-1.5	0.0
Shorten set bait season.	1.24	-0.2	-0.4	6.17*	-0.1	-0.7
Discontinue set bait season.	7.18*	-0.7	-1.2	4.08	-1.1	-1.5
Shorten entire season.	11.08***	-1.2	-0.3	0.34	-0.3	-0.3

[a] Mean scores were computed by assigning values of -2, -1, 1 and 2 to response of "strongly disagree," "somewhat disagree," "probably agree," and "strongly agree," respectively.

[b] Asterisks denote significance between distributions of responses at the following levels: * $p \leq .10$; ** $p \leq .05$; *** $p \leq .01$

Table 9. Differences in evaluations of regulations according to whether respondents used a guide.

Regulations	Residents			Nonresidents		
	Chi-square	Mean Scores[a] Guide	NGuide	Chi-square	Mean Scores Guide	NGuide
Current						
1990—Permit required before deer season.	4.71	-0.4	-0.1	8.88**[b]	0.6	0.1
1990—Set baits only, Aug. 27 to Sept. 15.	2.39	0.2	0.1	8.01**	0.5	0.4
1990—Hounds only, Sept. 22 to Oct. 26.	1.54	-0.6	-0.4	7.32*	0.0	-0.4
1990—1-week overlap (Sept.15–Sept.22), set bait and hounds.	2.24	-1.2	-0.6	9.03**	-0.4	-0.9
Proposed						
Restrict number of permits.	0.89	-1.0	-0.6	5.11	0.0	-0.2
Shorten hound season.	1.58	0.8	0.8	17.21***	0.4	1.2
Discontinue hound season.	0.18	-0.1	0.1	16.24***	-0.5	0.4
Shorten set bait season.	1.66	-0.6	-0.2	17.70***	-0.9	-0.2
Discontinue set bait season.	2.93	-1.6	-1.0	19.60***	-1.6	-1.1
Shorten entire season.	2.63	-0.1	-0.3	4.78	-0.3	-0.1

[a] Mean scores were computed by assigning values of -2, -1, 1 and 2 to response of "strongly disagree," "somewhat disagree," "probably agree," and "strongly agree," respectively.

[b] Asterisks denote significance between distributions of responses at the following levels: * $p \leq .10$; ** $p \leq .05$; *** $p \leq .01$

Table 10. Differences in evaluations of regulations according to whether respondents hunted bear prior to 1980.

Regulations	Residents			Nonresidents		
	Chi-square	Mean Scores[a] PrHunt	NPrHunt	Chi-square	Mean Scores PrHunt	NPrHunt
Current						
1990—Permit required before deer season.	11.05***[b]	-0.8	0.1	4.96	-0.1	0.5
1990—Set baits only, Aug. 27 to Sept. 15.	7.54*	-0.2	0.2	16.45***	-0.5	0.6
1990—Hounds only, Sept. 22 to Oct. 26.	5.09	-0.9	-0.3	0.69	-0.3	-0.2
1990—1-week overlap (Sept.15–Sept.22), set bait and hounds.	1.45	-0.7	-0.7	1.20	-0.9	-0.5
Proposed						
Restrict number of permits.	2.44	-0.9	-0.6	8.87**	-0.9	0.0
Shorten hound season.	7.43*	0.5	0.9	0.31	0.9	0.7
Discontinue hound season.	13.10***	-0.1	0.1	0.77	0.1	-0.2
Shorten set bait season.	2.04	0.0	-0.3	2.65	-1.0	-0.6
Discontinue set bait season.	3.76	-0.9	-1.1	4.48	-1.4	-1.4
Shorten entire season.	4.86	-0.7	-0.1	3.04	-0.7	-0.2

[a] Mean scores were computed by assigning values of -2, -1, 1 and 2 to response of "strongly disagree," "somewhat disagree," "probably agree," and "strongly agree," respectively.

[b] Asterisks denote significance between distributions of responses at the following levels: * $p \leq .10$; ** $p \leq .05$; *** $p \leq .01$

affected hunters' responses to a proposal restricting the number of permits. Pre-1980 hunters disagreed with the regulation, while post-1980 hunters were neutral. It is likely that hunters with early hunting experiences do not appreciate the restrictions placed on the season.

To facilitate analysis, responses to open-end questions were divided into those who agreed with the regulation (those who answered Strongly Agree and Probably Agree) and those who did not (those who answered Strongly Disagree and Probably Disagree). One or two reasons predominated the responses to all regulations, so we report the top three answers for those who agreed or disagreed with each question. These responses are presented in Tables 11 and 12. Responses to these questions are not stratified according to the residency of respondents.

Respondents agreed with the bait-only, hound-only, or both method seasons primarily because they believe it will reduce conflict among hunters using different methods (Table 11). The primary reasons they disagree with the seasons appear to be because they disapprove of the method or of restrictions of a desired method.

Hunters agree with the proposed regulations to restrict the number of permits or shorten the season because they believe it will benefit the bear population in Maine (Table 12). With respect to proposed regulations, hunters agreed with method-specific regulations as a way to restrict a hunting method of which they do not approve, and they disagreed with the method-specific regulations because they want to protect their desired method of hunting.

Table 11. Open-ended responses to the questions asking hunters to explain why they agreed or disagreed with the current regulations.

1990—Permit Required to Hunt Bears Before the Start of the Firearm Season for deer on October 27

Agree	%	Disagree	%
Regulates/Controls hunt	36	Permit used just to make money	12
Provides revenue/income	19	Already bought big game license	12
Help bear population	4	Issue 1 license all season	10

1990—Hunting Over Set Baits Only from August 27 to September 15

Agree	%	Disagree	%
Chance for non-dog hunter	19	Too short	20
Fair	11	Disapprove of bait	14
Reduces conflict	11	Restrictive	8

1990—Hunting with Hounds Only from September 22 to October 26

Agree	%	Disagree	%
Decreases conflict	23	Disapprove of dog hunt	43
Gives each own season	9	Restrictive	9
All hunters have equal rights	7	Too short	5

1990—The 1-week Overlap (Sept. 15–Sept. 22) Between Set Bait Hunting and Hound Hunting

Agree	%	Disagree	%
Good chance to enjoy both	17	Hurts bait and other hunters	22
Overlap is okay	16	Overlap no good/competition	21
Fair chance for all	9	Don't approve dog hunt	16

Table 12. Open-ended responses to the questions asking hunters to explain why they agreed or disagreed with the proposed regulations.

Restrict the Number of Permits Issued Each Year			
Agree	%	Disagree	%
Help the bear population	28	People's right to hunt	14
Agree/Approve	23	Not necessary	11
If necessary	8	Disapprove of permit	10
Shorten the Hound Season			
Agree	%	Disagree	%
Disapprove of hound hunt	31	Hound hunters kill few bear	19
Discontinue hound season	13	All hunters have equal rights	11
Hounds kill lots bear	9	Too short now	10
Discontinue the Hound Season			
Agree	%	Disagree	%
Disapprove of hound hunt	59	Make it equal for all	41
Agree - discontinue	7	Approve of hound hunt	10
Bear has no chance	7	Dogs don't take many bear	7
Shorten the Set Bait Season			
Agree	%	Disagree	%
Disapprove of bait hunt	12	Too short/not long enough	18
Bait hunters take most bear	11	Bait is good method	13
Will reduce harvest	9	Bait isn't easy method	9
Discontinue the Set Bait Season			
Agree	%	Disagree	%
Disapprove of bait	35	Good method of hunting	23
If necessary for bear	12	Make it equal for all	17
Bait takes lots bear	11	Bait gives hunter chance	9
Shorten the Entire Season			
Agree	%	Disagree	%
Help bear population	30	Short enough	18
Fair for all	16	Not necessary	13
Reduce bear harvest	11	Keep season same	7

DISCUSSION

Overall, resident and nonresident hunters agree with the bait-only season and the regulation requiring a permit to hunt bear in Maine prior to the November deer season, and they disagree with the hound-only and bait/hound overlap seasons (see Table 3). Resident and nonresident hunters collectively disagree with all proposed bear-hunting regulations except shortening the hound season (see Table 4). The reasons for these responses become clear when respondents are stratified into groups according to the hunting method they use.

Residents and nonresidents who use set bait agree with the bait-only season, while those who do not use set bait disagree with the bait-only season (see Table 7). Hunters who use set bait were less likely to disagree with the hound-only season than were hunters who do not hunt over set bait. Considering responses to the open-ended questions, bait hunters approve of the bait-only season because it reduces conflict with hunters who use dogs. Although bait hunters may not approve of hunting with dogs, they are less likely to disapprove of the hound-only season because it helps resolve the conflict. Non-bait hunters (primarily hunters who use dogs) may not approve of this season stratification because bait hunters do not interfere with their hunting, and they perceive that their season has been shortened.

Both resident and nonresident bait hunters disapprove of proposals to shorten the bait season and strongly disapprove of proposals to discontinue the bait season (see Table 7). Hunters using other methods approve of plans to shorten the bait season and show a lower level of disapproval with a plan to discontinue the use of bait. Approval for shortening the bait season may be related to the higher success rates of bait hunters and disapproval of discontinuing bait hunting may reflect a respect for others to have opportunities to practice other hunting methods.

A different story arises when we consider hunters who use hounds. Hunters who use hounds disagree with shortening or discontinuing the hound season, while other hunters tend to agree with these regulations. Hunters who use hounds are less likely to disagree with proposals to shorten or discontinue the set-bait season. Thus, while hunters who use hounds appear to accept hunting over bait, perhaps because they use bait to start their dogs, hunters who do not use hounds are not nearly as accepting of bear hunting with dogs.

The use of guides did have a substantial influence on nonresident responses. Nonresident response distributions were significantly different for eight of the ten regulations considered according to whether these respondents employed a guide or not (see Table 9). Hunters who used a guide were less likely to approve of shortening the hound season and more likely to disapprove of discontinuing the hound season. These individuals were also more likely to disapprove of shortening or discontinuing the set-bait season. This pattern of responses may be due to guides using bait to start their dogs and their clients having a higher probability of getting a bear.

Among other data stratifications, hunting over natural food sources did not have much of an effect on resident evaluations of the regulations, but nonresidents appear to perceive more of a conflict with hunters who use bait (see Table 6). This may be due to the natural and set-bait seasons running concurrently, hunters setting bait near natural food sources with signs of bear, and hunters who set bait being more successful. The data stratifications on success (got bear in 1990) and hunting experience prior to 1980 did not help to explain evaluations of the regulations.

In Heberlein's study (1978) of hunters' responses to proposed changes in the Wisconsin deer season, he identified four main reasons for hunters' opposition to the proposed changes: (1) tradition, (2) not everyone believes there is a problem which needs to be fixed, (3) hunting ties to social and nostalgic aspects, and (4) proposals offered didn't give hunters choices and were often restrictive. The current study, by stratifying hunter evaluations according to hunting method, illuminates these suggestions. Maine bear hunters oppose proposals that restrict the method of hunting they use, but are less likely to oppose restrictions on other hunting methods. Thus, the tradition in the current study is the method of hunting used.

With respect to beliefs and choices, the 1990 change to a bait-only season received approval because it gave hunters who use bait an opportunity to hunt without competition from hunters who use dogs, and a number of these hunters believe that the use of dogs is not appropriate. This result carries over to proposed regulations to limit hunting over bait. The dog-only season did not receive approval because hunters who use bait do not approve of hunting with dogs, and the approval of hunters who use dogs for this season was weak because they did not believe there was a problem. Consequently, hunters who use hounds appeared to feel their choice opportunities were restricted, particularly those who use set bait to start their dogs.

If IF&W deems it necessary to further reduce harvest levels, method-specific regulations will be challenged by the hunters who use that method. Hunters who use bait represent the majority of bear hunters, take the greatest number of bears annually, and would probably voice strong opposition to regulation changes that affected their use of bait. Hunters who use hounds are a small proportion of the bear hunting public, take a small proportion of the annual harvest, and will oppose changes that further restrict their use of hounds.

The dilemma for IF&W, therefore, is to strike balance between the different hunting methods. Hunters who use bait represent the largest portion of the bear hunting public and will oppose restrictions on setting bait, but will support restrictions on the use of hounds. Thus, restrictions on the use of hounds will meet with the approval of the majority of bear hunters. However, although restricting the use of hounds may be politically expedient, it may not be the most successful mechanism for reducing harvest levels since the majority of bears are taken by hunters who use bait. Serious attempts to reduce harvest levels may require regulations that are not attractive to the majority of hunters: further restricting the use of set-bait.

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