

A TELEPHONE QUESTIONNAIRE TO ASSESS MOOSE HARVEST

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ABSTRACT: Since 1985 Alberta Natural Resources Service has used an annual telephone questionnaire to obtain harvest information on big game and game bird species. Telephone calls are handled by members of 100 cooperating resource user groups throughout Alberta. Almost 1,000 club members complete about 75,000 questionnaires each year. Organizations use the program as an annual fund raiser and are compensated CAN \$0.50 for each completed questionnaire. The program enables wildlife resource users to participate in wildlife management. Alberta Natural Resources Service benefits by collecting harvest data in a cost effective and timely manner. The scope and logistics of the program are discussed.

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Information essential for the management of any hunted species includes numbers of animals removed, numbers of hunters participating, hunter success rates, hunter days of effort to harvest an animal, and total hunter days of recreational opportunity provided by the hunt. Timmerman and Buss (1998: 608) expressed that "the benefit of a harvest system can only be assessed fully if the hunter kill can be determined with reasonable accuracy". In North America, big game harvest data is often obtained from compulsory registration, check stations, mail-out questionnaires, telephone surveys, or combinations of the above (Wing 1951, Lynch and Carr 1974, Timmerman and Buss 1998).

In Alberta, Canada, the first attempt to collect hunter harvest statistics on moose (*Alces alces*) occurred following the 1979 hunting season (Alberta Natural Resources Service, *unpubl. data*). In 1984, a mail-out questionnaire was sent to resident hunters who held a moose, elk (*Cervus elaphus*), white-tailed deer (*Odocoileus virgin-*

ianus), or mule deer (*O. hemionus*) license. In 1985, the first province-wide telephone survey was used to sample resident big game and game bird hunters. The telephone survey provided timely information in a cost effective manner and it incorporated strong resource user participation with minimal agency manpower. We report 13 years of experience with the telephone survey in Alberta.

BACKGROUND

Big game management is a complex undertaking in Alberta because there are 9 species to manage and a variety of license types and season dates available for each. For moose, there are 3 Special (those requiring application and a draw) and 1 General (non-draw) license types. Table 1 lists the moose Special licenses and draw statistics recorded for a typical year. Moose hunters must select from >34 license type/season date/wildlife management unit (WMU) combinations each year. Hunters benefit from the complexity because they

Table 1. Draw statistics for moose Special licenses in 1996.

Special license type	Number available	Applicants	% drawn
Antlered moose	12,707	26,817	40%
Antlerless moose	1,436	8,788	16%
Calf moose	582	1,280	45%
Totals	14,725	36,885	-

Note: Percentages are not directly calculated because some WMUs are over-subscribed while others are under-subscribed.

have many choices and hunting seasons are offered in several areas of the province that would otherwise be closed under a less complicated format. The licensing task is aided by a computerized "1-900" telephone exchange that applicants use to apply for Special license draws, a computerized link between license vendors and the department's main computer system, and the availability of systems staff who process license sales data, conduct drawings for the hunter harvest survey, enter questionnaire returns into a mainframe computer, and prepare the data so it may be further analyzed.

Most hunting seasons in Alberta close by November 30. Meetings aimed at establishing hunting seasons and bag limits for the next year begin in February in the 5 administrative regions and by mid-May new regulations have to be finalized and sent to the printer. Season dates, the Guide to Hunting Regulations, and Guide to Hunting Draws are ready for distribution to the hunting public by the first week in June. Wildlife managers have about 10 weeks in which to complete and analyze both aerial survey and hunter harvest surveys if they wish to use current information during the season setting process, hence the importance of survey methods that are time, as well as cost, effective.

METHODS

One staff member with Alberta Natural Resources Service administers all aspects

of the telephone questionnaire, including final analysis on returns from the survey. Assistance is provided by systems analysts that conduct the randomized selection process and print the questionnaire forms. Telephone calls are made by members of 100 cooperating fish and game, bowhunting, Junior Forest Warden, Boy Scout, and other organizations throughout the province. Table 2 lists the series of activities that are completed as part of the telephone questionnaire.

Pre-survey Activity

In preparation for the telephone survey each year, questionnaire templates in the computer must be edited to adjust season dates. There may be up to 9 variations of the same questionnaire because of the variety of season dates. The telephone exchange database must be edited and updated. All clubs must be contacted to determine which are interested in participating in the next telephone survey. Contact person's names, addresses, and phone numbers are verified. A detailed information package and instruction manual are prepared and sent to each cooperating club. Special telephone exchange sort codes are used to match local telephone exchanges with cooperating clubs to ensure that long distance calls are never required.

Prior to the questionnaire draw, sample sizes are calculated for each license type. Equations were recommended by statisti-

Table 2. List of major activities related to logistics of the telephone survey.

Pre-survey Activity (before December 1).

1. Edit questionnaire database (add/delete templates, adjust dates).
2. Sign up cooperating clubs who will do the phoning.
3. Update telephone exchange information.
4. Compute sample sizes for all questionnaire types.
5. Prepare information packages for the clubs.
6. Conduct the randomized draw and print the questionnaires.
7. Send materials to the clubs.

Conduct the Telephone Survey (during December).

1. Distribute questionnaire material within clubs.
2. Make the telephone calls.
3. Return questionnaires to the Wildlife Branch.
4. Submit an invoice.

Receive questionnaires from cooperating clubs.

1. Submit completed questionnaires for data entry.
2. Pay invoices.
3. Complete data roll-ups at the WMU level.
4. On a PC, complete data analysis and print results.
5. Prepare final reports.

cian D.C. Bowden (Colorado State University, *pers. comm.*, 1985). Lynch (1985, 1986) discusses equations in more detail. The sample size equation shown below works well for Special licenses where the number of licenses per WMU is known. General licenses are not sold by WMU, therefore a simple percentage (i.e., 25%) is used for sample sizes for General licenses. When numbers of licenses are very small or where extra detail is required, 100% of license holders are included in the sample. The sample size equation is:

$$n = \frac{n_o}{\frac{1 + n_o - 1}{N}}$$

where;

N = number of licenses, and

$$n_o = \frac{[Z_{(t)}]^2 (1-P)/P}{h^2}$$

where;

Z = standard normal distribution,

P = expected % hunter success
expressed as a proportion,

h = selected % (i.e., $\pm 10\%$).

A mainframe computer is used to randomly select the hunters who will be questioned. The hunter's name and telephone number are added to the questionnaire, along with the telephone exchange code (sort code). The computer sorts and prints the questionnaires in order of sort code, telephone number, and hunter's name, thus simplifying the packaging of materials and procedures when a hunter is selected for more than one questionnaire. Between 70,000 and 80,000 questionnaires, including

78 variations of questionnaires, are selected and printed each year.

Conduct the Telephone Survey

Contact persons for each club are responsible for receiving the package of printed questionnaires and getting them distributed to members who will be doing the calling. The questionnaires use a simple format and are designed to capture harvest, hunter effort, and date of kill information. A questionnaire can be completed in less than 1 minute. Bowhunting and game bird questionnaires are more complex and hence require more time to complete.

Callers are instructed to complete calls between 1800 and 2130 hours, when most people may be found at home. A minimum of 2 attempts are made to contact a hunter. Callers receive instructions on how to deal with various situations that could arise during a telephone interview. They are instructed to speak only to the person named on the questionnaire to ensure that first-hand information is obtained. Callers are to indicate that they are calling on behalf of the Wildlife Division of the Alberta Government. Hunters are asked the questions as outlined in logical order on the printed questionnaire form. When a hunter has been selected for more than one questionnaire or when another hunter at the same address has been selected, all of the questionnaires can be completed with a single phone call.

All telephone calls are to be completed during December. The club contact person returns all completed and uncompleted questionnaires to the Wildlife Branch during the first week of January, along with an invoice and list of people who participated as callers. Organizations are paid CAN \$0.50 for each completed questionnaire.

Post-survey Activity

Returned questionnaires are submitted for data entry; 1 operator can enter about

1,800 questionnaires per day. Five or six individuals can complete all data entry in about 10 workdays. An edit program checks the data for accuracy as it is being entered. The error rate varies, depending on the complexity of the questionnaire. Big game questionnaires have an error rate of about 2.0%, while the rate on more complex game bird and bowhunting questionnaires is about 10%.

The entered data resides in a database in the Government's mainframe computer. From there it can be downloaded to a PC, where the final analysis is performed and tables of results are printed. The tables are usually bound in report format and made available to wildlife management staff for use in establishing the next year's hunting regulations.

The following equations recommended by Bowden (Colorado State University, *pers. comm.*, 1985) were used to compute estimated harvest figures and their confidence limits:

$$\text{estimated harvest} = N \times P,$$

where;

N = licenses sold, and

P = success rate = K/n,

where;

K = sample harvest, and

n = sample hunters.

Confidence Limit on the harvest estimate is;

$$C.L. = N \times Z \times \sqrt{\frac{N-n}{N} \times \frac{P(1-P)}{n}}$$

where;

$Z_{\alpha/2}$ = standard normal distribution.

Confidence Limit on subtotals and totals;

$$\text{Total} \pm Z_{\alpha/2} \sqrt{\frac{N_1^2 (N_1 - n_1) P_1 (1 - P_1)}{N_1 n_1 - 1} + \frac{N_2^2 (N_2 - n_2) P_2 (1 - P_2)}{N_2 n_2 - 1} + \dots}$$

Simple equations were used to calculate estimated number that did hunt, estimated number that did not hunt, % C.L.,

participant success (%), hunter success (%), total hunter days, mean hunter days, and hunter days per animal harvested (Lynch 1985,1986).

DISCUSSION

We found the telephone survey to be cost effective. Only 1 Wildlife Branch staff member is needed to administer the entire program, complete the final analysis, and print the tables of results. The annual budget for the entire program is < CAN\$54,000 (data entry \$6,000, completed questionnaires \$40,000 - \$45,000, shipping/postage \$1,200, and compensation gifts to callers \$3,000). The telephone survey was found to be less costly than a comparable mail-out questionnaire. For example, if 80,000 questionnaires are sent to the clubs and there is a 70% completion rate, the cost for the questionnaires would be \$28,000 (\$0.50 per completed questionnaire). If that number of questionnaires were sent by mail, postage for the first mailing alone would be \$36,000.

The telephone survey is conducted immediately after the close of the hunting season when hunters would have good recollection of their hunt. We did not test the ability of hunters to provide accurate information over the telephone. However, the questionnaires were extremely simple, with the most important question being "did you kill a moose under this license"? Hunters would certainly know if they killed a moose or not, but they may have had difficulty recalling the number of days they hunted in specific WMUs.

Data provided by the telephone questionnaire are quickly captured and analyzed in time to be used by wildlife management biologists as they plan hunting season strategies for the next hunting season. A proper mail-out survey could never be completed in time for the results to be used during the current hunting season setting process.

The telephone survey is well received by the hunting public. Most hunters are eager to report on their hunting experience. The program is also popular with cooperating clubs who use it as an annual fund raising activity. The telephone survey provides a unique opportunity for resource user groups to participate in the wildlife management process in a meaningful way.

Over the 13 years that the telephone survey has been used in Alberta, there has been an evolution of improvements to the procedures, especially those concerning logistics. Instantaneous recovery of license sales information is the latest enhancement, and enables the production of final harvest analysis tables in a timely manner. Anyone interested in more details about the program or examples of the questionnaires may contact Alberta Natural Resources Service in Edmonton.

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