

MOOSE HUNTER EDUCATION IN NORTH AMERICA: A REVIEW

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ABSTRACT: Hunter knowledge and cooperation are essential for a successful moose management program. Twenty two jurisdictions in North America currently employ a variety of methods to communicate information, including, in order of increasing frequency: posters, special seminars, brochures, audio-visual material, pamphlets, personal contact, radio and television advertising, newspaper articles, and a printed summary of annual hunting regulations. Most agencies require first-time hunters to complete a hunter education course before granting hunting privileges, but few offer or require specific training for moose hunters. To date moose hunter education has been minimal and generally has failed to effectively communicate biological principles and management objectives. The strengths and weaknesses of current effort to educate moose hunters are reviewed and discussed.

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Hunter education in North American evolved in the late 1940's and early 1950's when hunter safety became a major concern (Boyd *et al.* 1981). At that time, the National Rifle Association of American (NRA) was instrumental in expanding their firearm safety courses and materials to include information for hunters.

In 1949, New York State was the first North American jurisdiction to require first-time hunters to complete a hunter safety training course prior to purchasing a hunting licence. During the 1950's many other jurisdictions began developing voluntary hunter safety programs in cooperation with organized hunter and angler groups. In 1957 Ontario became the first Canadian province to introduce a hunter safety training program. The Ontario program used material from the NRA and hunter safety training became mandatory for all first-time hunters in 1960 (OMNR 1988a).

Today nearly every state and province offer hunter education programs, the majority of which are mandatory for first time hunters. Most courses emphasize safe firearm handling and wildlife species identification. Additional material includes sections on hunter ethics, responsibility, wildlife management, field care and dressing, survival and first aid

(Anon 1980, Montana Department of Fish, Wildlife and Parks 1987, Wyoming Game and Fish Department 1987).

The North American Association of Hunter Safety Co-ordination (NAAHSC) was formed in 1972 to improve and upgrade hunter education programs throughout North America. Both the NRA and the International Association of Fish and Wildlife Agencies supports and assists the NAAHSC to achieve its goals (Boyd *et al.* 1981). Existing hunter education/safety courses however, provide little if any specific training for moose hunters.

Wildlife in North America are managed largely by state, territorial, and provincial governments and moose is one of 10 major big game species hunted (Payne 1989). In the 1960's moose hunting became popular in response to increasing moose populations and improved access to moose range (Crete 1987, Crichton 1987, Timmermann 1987). Moose populations declined across wide geographic areas of North America in the 1970's and many agencies applied restrictive harvest control measures. In the 1980's, all jurisdictions except the Yukon and Northwest Territories used either a selective or non-selective limited entry strategy or a combination of both to control harvest (Timmermann 1987).

By 1982, nineteen jurisdictions were involved in managing moose hunts and nearly 430,000 hunters harvested 70,000 moose annually (Timmermann 1987).

Quebec implemented an unrestricted, non-selective harvest strategy (Timmermann 1987) and at the same time using an illustrated brochure and film, attempted to convince moose hunters to select for calves (Grenier 1979). Other agencies developed more sophisticated harvest strategies designed to control the harvest of specific age or sex classes. For example, Saskatchewan introduced a sex and age selective hunt in 1977 (Stewart and MacLennan 1977). British Columbia (MacGregor and Child 1981), Ontario (Euler 1983a, Timmermann 1983), Manitoba (Crichton pers. comm. 1984) and Newfoundland (Oosenbrug pers. comm 1990) have since followed. Antler shape and size are criteria used by hunters to identify age and social class status of potential harvestable bulls in portions of Alaska (Smith *et al.* 1979), British Columbia, (Demarchi *et al.* 1983) and Idaho (Oldenburg pers. comm. 1984) thus restricting bull harvest. To function successfully all management strategies require compliance based on the hunters knowledge and most agencies have attempted to better educate their hunters to facilitate these new management strategies (Timmermann 1987).

Several jurisdictions have reopened moose seasons after long closures or have established moose seasons for the first time in response to expanding moose populations. Those included are: Idaho 1970 (Oldenburg pers. comm. 1984), Minnesota 1971 (Judd 1972), North Dakota 1977 (McKenzie pers. comm 1984), Washington 1980 (Rieck pers. comm. 1990), Maine 1980 (Dunn and Morris 1981), Colorado 1985 (Duvall and Schoonveld 1988), and New Hampshire 1988 (Klein pers. comm 1990). Establishing moose hunts in these jurisdictions with no recent history of moose hunting presented an especially formidable education challenge. For example,

New Hampshire provided public information on the biological status and management needs of moose three years prior to opening its first season (Sherrod 1990).

This paper reviews and discusses the effectiveness of recent moose hunter education strategies implemented by 22 North American jurisdictions that currently offer moose hunting seasons.

Basic Hunter Education Requirements

Possession of a previous hunting licence, proof of completing a hunter education/safety course or test or proof of attending a hunter education course and passing a mandatory test are prerequisite in 20 of 22 agencies canvassed (Table 1 Fig.1). Fees for courses vary from free up to \$120.00. Some jurisdictions (eg. Montana, Minnesota, Washington) require firearm education training for only young hunters under 17 or 18 years of age and all older first-time hunters. Only the Yukon and Northwest Territories lack some form of formal hunter education requirement but all provide for voluntary training. Conventional Alaskan rifle hunters are exempt from mandatory hunter education, while archery hunters must participate in both a classroom written exam and field skills test and those using muzzle-loading firearms are required to attend a 1 day orientation session.

Moose hunting opportunities are limited to once in a lifetime in Washington, Idaho, Minnesota, Utah, Colorado, and North Dakota if a moose is claimed, or to a specific waiting period (2 years in Maine, 3 years in New Hampshire, 4 years in New Brunswick. In many jurisdictions significant numbers of new inexperienced hunters take up the sport each year. Hence novice, moose hunters present a particular educational challenge. Only Alaska, New Hampshire, and Minnesota (NE) have developed a mandatory moose hunter pre-hunt orientation session. Ontario has developed course material and an instructors manual for a proposed mandatory course for first time

Table 1. Hunter education requirements in 22 North American jurisdictions that manage a moose hunt (circa 1990).

Jurisdiction	Course Type		Exam Required		Shooting Test	Fee(\$)
	General ¹	Specific ²	General ¹	Specific ²		
ALASKA	V	M ³	-	M ³	M ³	-
COLORADO	M	-	M	-	-	5-10
IDAHO	M	-	M	-	-	2
MAINE	M	-	-	-	-	0-2
MINNESOTA	M	M	M	M ⁴	-	5
MONTANA	M	-	M	-	-	-
NEW HAMPSHIRE	M	M	M	M ⁴	-	-
NORTH DAKOTA	M	-	M	-	-	-
UTAH	M	-	M	-	-	4
WASHINGTON	M	-	M	-	-	-
WYOMING	M	-	M	-	-	0-5
ALBERTA	V	-	M	-	-	-
BRITISH COLUMBIA	V	-	M	-	-	14-120
MANITOBA	M	-	M	-	-	1-10
NEW BRUNSWICK	M	M ⁵	M	M ⁵	M ⁵	-
NEWFOUNDLAND	V	M ⁵	-	M ⁵	M ⁵	-
N.W. TERRITORIES	V	-	-	-	-	-
NOVA SCOTIA	M	-	M	-	-	10
ONTARIO	M	V ⁶	M	V	V	20-40
SASKATCHEWAN	M	-	M	-	-	0-50
QUEBEC	M	M ⁷	M	M	M ⁷	22-25
YUKON	V	-	-	-	-	-

M - Mandatory

V - Voluntary

¹ General hunter safety /education course² Specific big game or moose hunter education³ Big game archery/muzzle-loader course⁴ Prehunt orientation session⁵ Once in a lifetime requirement for big game hunters⁶ Big game archery hunters only, includes test and shooting⁷ Mandatory for first-time archery hunters only

moose hunters. However legislation confirming the requirement has not been forthcoming.

Shooting Proficiency

Hunter shooting proficiency is fundamental to ensuring a quick humane kill. Practical shooting exercises are provided for, in less than half (9 of 22) of jurisdictions conducting moose hunts in North America (Table 1). Most agencies that include practical

shooting and marksmanship as components of hunter education do so only during the basic hunter course. Only Newfoundland and New Brunswick require shooting tests of their big game hunters. Qualification is a once in a lifetime requirement in these Provinces.

North American hunter shooting skills may be considered poor. Results obtained (1976-1988) from voluntary testing of 5,500 Ontario hunters (one of the only reported evaluations under standard conditions) using

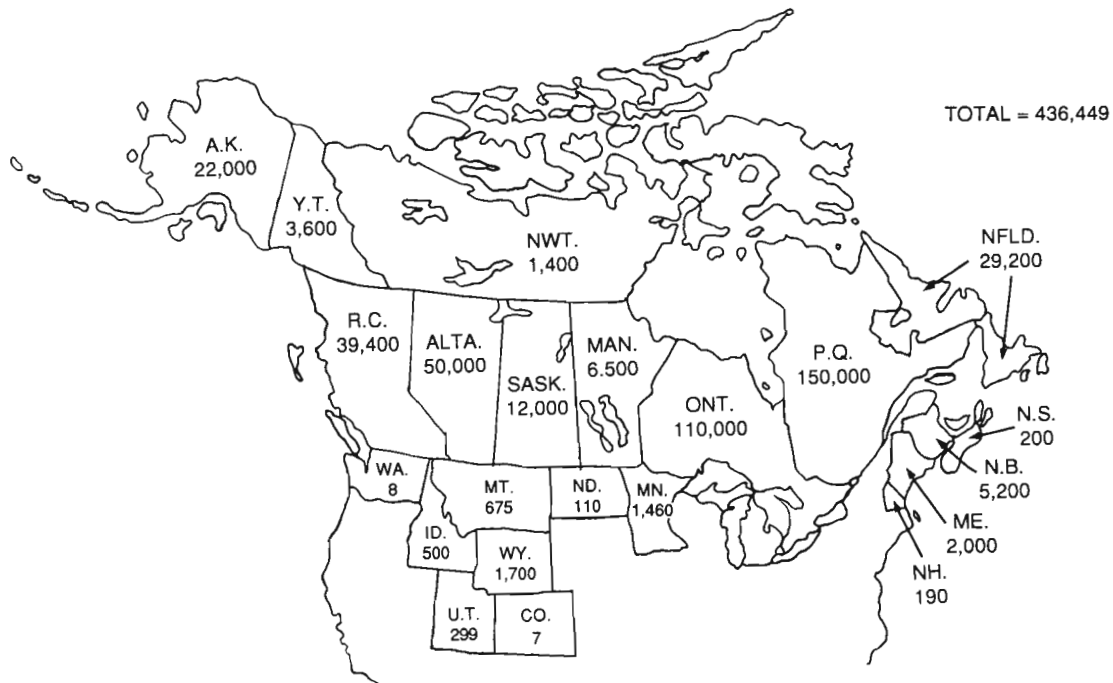


Fig. 1. Licenced moose hunter numbers, circa 1990-91 for 22 North American jurisdictions.

life-size targets indicate that as many as 30% of shots taken could result in wounding with subsequent retrieval of the moose questionable (Timmermann 1977, Buss *et al.* 1989). Similarly, in 1990 Newfoundland reported a 32% failure rate among 5531 individuals who took part in the once-only mandatory big game hunter capability test which includes a shooting proficiency test (Newfoundland and Labrador Wildlife Division 1992). A 48-page hunter study guide gives basic information on firearm and ammunition types, marksmanship, field safety, ethics and legal responsibilities (Newfoundland and Labrador Wildlife Division, undated). Participants are required to place 2 of 3 shots inside an unmarked location representing the vital areas (heart, lung) on a life-size target. In New Brunswick where first time moose hunters are required to hit a 42 x 42 cm. target with 2 of 3 shots at 40m, the failure rate is approximately 15% (Redmond pers. comm. 1990).

Using life-sized targets and providing information on moose anatomy helps to teach

hunters the location of vital areas on moose to ensure clean kills. Most hunter education manuals give cursory coverage to this subject (Anon 1980, Montana Dept. of Fish, Wildlife and Parks 1987, Wyoming Game and Fish Dept. 1987, OMNR 1988a). More recently, both Ontario and Newfoundland have developed written and illustrated material specific to moose (OMNR 1988b, 1988c, Interesting Services Inc. 1989, Newfoundland and Labrador Wildlife Division, undated). Information includes location of the circulatory system, internal organs, target area shots to be avoided, target area relative to moose position and the shooter, firearm sighting, and field care and dressing.

General Information

Basic information, free of charge, is published annually in summaries of hunt regulations. These summaries (Table 2) vary in size, page length and paper quality (newsprint to gloss with colour photos). Generally, information provided lists the agencies' various

Table 2. Moose hunter information sources in 22 North American jurisdictions (circa 1990-91).

Agency	Information Sources					Information Provided by Hunters Harvest		Attitude Surveys Conducted		
	HuntSummary size(cm)	Supplemental		Total Pages	Kill	Age	Repro. Tracks	Regularly	Periodically	
		Total Pages	# Pages on Moose							# Publications
ALASKA	20x26	50	7	3	5	M	V	-	-	-
COLORADO	10x22	6	0.2	3	3	V	V	-	-	X
IDAHO	18x26	32	4	-	-	V	-	-	-	X
UTAH	29x37	24	20	-	-	V	V	-	X	-
WYOMING	21x28	40	2	-	-	V	V	-	-	X
MONTANA	27x21	38	2	-	-	V	-	-	-	X
N. DAKOTA	22x28	4	0.5	-	-	V	V	-	X	-
MINNESOTA ¹	21x28	-	-	2	43	M	M	-	-	-
MAINE ¹	11x20	39	1	5	34	M	V	V	-	X
NEW HAMPSHIRE ¹	13x21	5	-	8	73	M	M	M	-	-
WASHINGTON	21x27	40	0.2	-	-	M	M	-	-	-
YUKON	11x29	19	1	3	22	M ³	-	-	-	X
N.W. TERRITORIES	10x23	8	0.5	1	8	V	-	-	-	-
BRITISH COLUMBIA	20x27	71	20	6	21	V	V	V	-	X
ALBERTA	21x28	41	2	1	31	V	V	-	-	X
SASKATCHEWAN	20x23	38	2	-	-	V	V	-	-	-
MANITOBA	27x21	24	2	2	20	V	V	V	-	-
ONTARIO ²	21x28	23	6	3	90	V	V	-	-	X
QUEBEC	13x18	138	24	4	30	M	M	-	X	-
NEW BRUNSWICK	10x23	9	0.5	3	22	M	M	-	-	-
NOVA SCOTIA	10x17	33	1	-	-	M	M	-	-	-
NEWFOUNDLAND ¹	19x28	56	12	1	23	M	V	V	-	X

¹ Special moose hunt information booklet with application form provided.

² OMNR (1990) included in supplemental information.

³ Requirements enforced for non-residents only.

M - Mandatory

V - Voluntary

game laws and regulations, management area(s), area maps, season dates and licence quotas/fees. The amount of information about moose varies from just a few words (Washington) to 24 pages (Quebec) and rarely provides hunters with specific biological or management related data. Currently, only Newfoundland provides specific educational material to moose hunters in their hunting summary, including selective harvest rationale, identification features, shot placement, field dressing, and answers to commonly asked questions (12 of 56 pp., see Table 2).

Supplemental Information

Twelve of 22 agencies provide supple-

mental information to moose hunters (Table 2). The number of publications (1 in Newfoundland to 8 in New Hampshire) and page lengths (5 in Alaska to 90 in Ontario) vary among jurisdictions. Four jurisdictions (Minnesota, Maine, New Hampshire and Newfoundland) publish a separate moose hunter application guide or information booklet to assist hunters applying for a limited number of area specific moose licences (Table 2). Several agencies (Alaska, Minnesota, Maine, New Hampshire, Manitoba, Ontario and Newfoundland) have developed either a mimeo handout or formal booklet to educate moose hunters about proper field care and handling procedures (Rutske 1989, New

Hampshire Fish and Game Dept. undated, Maine Dept. Inland Fisheries and Wildlife undated).

General information on moose life-history is available in commercial print form (Van Wormer 1972, Franzmann 1978, Coady 1982) at both stores and libraries. Specialized subject material includes field care and handling (Anon. 1970), calling and hunting techniques (Grenier undated, Labelle 1983, Mongrain 1986), antler scoring (Boone and Crockett Club 1988) and photography (Rue 1985, Hoshino 1988, Runtz 1991).

More recently, two comprehensive texts were written specially for moose hunters (Ruel and Le boeuf 1987, OMNR 1990). Information includes material on basic moose biology, habitat needs, reproduction, parasites and diseases, management techniques including forest management, regulations, hunter ethics, equipment, firearm sighting, shot placement, identification features, hunting basics and field care and handling.

Hunters provide information to wildlife managers on their kill (mandatory in 10, voluntary in 12 jurisdictions), including age of kill (6 mandatory, 12 voluntary), and female reproductive status (1 mandatory, 4 voluntary) (Table 2). Hunter attitude surveys are conducted regularly in 3, periodically in 10, and not at all in 9 jurisdictions.

Communication Methods

Effective communication with hunters depends on wildlife managers building credibility and providing sound factual information on a regular basis (Bubenik 1981, Crow

et al. 1985). A clearly defined policy and knowledge of various interest groups is an asset in marketing a new moose management program (Flynn 1984). Agencies use a variety of methods in communicating information to moose hunters (Table 3). The print media and personal or media contact are used by most agencies while half or less use audio/visual or poster material.

Case Study-Ontario

Voluntary moose hunter education seminars including opportunities to shoot at life-sized moose silhouettes were introduced in Ontario in 1976 (Buss 1978, Timmermann 1977, 1987). These sessions were in addition to the mandatory hunter education program required for first-time hunters which began in 1960. Moose hunter seminars were initiated by Dr. Tony Bubenik based on his experiences with hunter education in Switzerland, Austria, and Czechoslovakia. Voluntary seminars continue to offer a wide range of educational material including basic moose biology, sex/age identification, proper field care and handling, hunting techniques, ethics and hunting laws.

In 1979 Ontario's moose management program faced the problems of declining moose populations and related recreational and economic benefits (OMNR 1980a). A series of 72 public meetings involving over 7000 hunters were held with to discuss management options. Information provided at these meetings included a film "Monarch of the North", detailing management of moose in Ontario, and a pamphlet "Moose Manage-

Table 3. Methods of communicating moose hunter information in 22 North American moose jurisdictions

	Methods of Communication								
	Posters	Special Seminars	Brochures	Audio Visual	Pamphlets	Personal Contact	TV	Radio/ Articles	Reg's
Agency Use	5	8	10	11	15	15	16	21	22

ment in Ontario - Problems and Possible Solutions". Hunters were encouraged to complete a standard questionnaire indicating their level of agreement or disagreement to proposed alternatives on management strategies aimed at increasing moose numbers (OMNR 1980a). A provincial moose management policy (OMNR 1980b) was approved in December 1980 and included the implementation of a harvest strategy requiring two hunters to share one moose if successful (Timmermann and Gollat 1984). This system was replaced by a province-wide selective harvest program in 1983 (Euler 1983a, Timmermann and Gollat 1986). Changes in regulations were communicated to hunters by a variety of means. Pamphlets employing a question and answer format were mailed to all previous seasons licence holders. A 22 page moose hunter handbook (OMNR 1984) was circulated, detailing 19 specific items, including moose identification features, rationale and benefits of selective harvest, as well as licence application rules. More recently, an annual moose hunter fact sheet has been published and distributed at all licence issuers and government offices.

Initially with the introduction of the selective harvest system in 1983, considerable emphasis was placed on communicating sex/age identification features and explaining the selective harvest philosophy to hunters. Instructional articles were also published in magazines (Euler 1983b, Timmermann 1983). A moose identification quiz consisting of sixty two -35 mm colour slides and a self evaluation score sheet were prepared and distributed to field offices. In addition a 21 minute film entitled "Of Moose and Man" (Brown and Associates 1984) was produced in both 16 mm and video formats. Field staff conducted community workshops/seminars and special information meetings. Local interviews with wildlife staff on radio and T.V. as well as feature newspaper articles continue to play a significant and ongoing role in com-

municating the program.

The response of hunters to these new regulations and their knowledge of moose biology were measured in a series of surveys conducted 3 and 4 years after the program was introduced (Rollins, 1987, Rollins and Romano, 1989). Results suggested that hunters had a high level of knowledge of harvest regulations but less understanding of moose management and biology. An expanded hunter education effort was recommended to strengthen hunter understanding in these weak areas. The support for the new selective harvest system was tempered by a significant amount of dissatisfaction, particularly relating to the hunter's enjoyment of the moose hunt (OMNR 1987). A program review was initiated in January 1987 with an internal working group identifying specific problem areas and presenting alternative solutions (Wedeles *et al.* 1989). Assistance was provided from eight regional advisory committees each consisting of 10-18 interested members of the public and representatives of special interest groups. Five major program improvements were recommended. They included legalizing party hunting for adult moose, introducing a sportsman's card, implementing a system for group applications, maintaining a two level preference pool system and initiating a mandatory moose hunter education program. Of these, introduction of a mandatory moose hunter education program for first-time moose hunters was suggested as an effective way to communicate hunting ethics and skills to novices. The opinions of hunters regarding these 5 recommendations were solicited using a mail survey questionnaire as well as through 55 OMNR offices throughout Ontario. A total of 2841 completed questionnaires was analyzed representing a 77% response rate. The majority of respondents agreed or strongly agreed with an increased emphasis on hunter education (Wedeles *et al.* 1989). To date 3 of the 5 recommendations have been implemented

including the printing of an extensive 78 page moose hunter education manual (OMNR 1990) to be used as the core curricula for a future mandatory moose hunter education course. In addition a draft (OMNR 1989) moose hunter education instructors manual and 2 videos entitled "Moose Hunt, a Guide to Success" (Interesting Services Inc. 1989) and "Firearms for the Moose Hunter" (OMNR 1988c) have been circulated to hunter education instructors.

The Scandinavian Experience

In Sweden moose hunter education has been an important tool for developing a successful moose management program. Sweden successfully tested voluntary education for moose hunters in the late 1970's (Hermansson pers. comm. 1984). Groups of 5-20 hunters meet 10-15 times, normally for 3-5 hour sessions. A basic text (Hermansson and Boethius 1975) contains core instructional material supplemented by an instructional book with questions and assignments. Supplemental information, including audio-visual material and invited experts, are available from the Swedish Sportsmen's Association. Prior to the introduction of mandatory hunter education in 1985, 10% of all Swedish moose hunters voluntarily attended one course every year. In addition Swedish moose hunters are required to demonstrate shooting proficiency annually, prior to hunting. Skills are developed at nearly 900 outdoor shooting ranges using a country-wide scoring standard.

All first time Norwegian moose hunters have been required to complete both a hunter education and practical shooting test since 1982. Previously licenced hunters are also encouraged to participate (Lykke pers. comm. 1981). Two additional comprehensive texts (Von Essen *et al.* 1981, and Hohle and Lykke 1986) give Scandinavian hunters access to a wide range of comprehensive educational material. These educational materials, com-

bined with a mandatory shooting requirement, has resulted in a more knowledgeable and informed Scandinavian moose hunter.

Future Direction of Moose Hunter Education in North America

Few North American agencies provide specific educational material related to the moose hunter or moose hunting. Few require a demonstration of shooting proficiency or conduct regular attitude surveys to measure understanding and support for existing management programs. I suggest Hunter Education specifically for moose hunters has been minimal at best and has generally failed to effectively communicate biological principles or management objectives.

In North America, I believe that the future of hunting depends on knowledgeable hunters. Education and public involvement are important for blending the biological and social context of hunting in a growing urban society (Minty 1989). The majority of respondents recently sampled in Newfoundland (92% of 6264) and Ontario (71% of 2841) for example, agreed that a specific hunter education program or training course should be mandatory for all first-time moose hunters (Newfoundland and Labrador Wildlife Division 1986, Wedeles *et al.* 1989).

In an article entitled "Quality Hunting" Clarke (1977) wrote "The most important by far of all things brought to the hunt is knowledge and understanding, and respect, all of which, so far as responsibility goes, are the things which the hunter has equipped himself. It is these that contribute most to his enjoyment."

In the future, if moose hunting is to survive as a sport, organized hunter groups, clubs and associations must show leadership and become much more active in promoting and conducting hunter education. Basic hunter safety/education courses are insufficient to meet the needs of managers and moose hunters. Additional training needs to focus on

stewardship, management objectives, humanness, ethics, shooting skills and above all the role of hunters in the entire ecosystem. Government's can help guide and direct this thrust by providing quality education material, and through attitude surveys which monitor if management strategies are well understood, supported and regulations respected. Organized hunters however must take up the challenge and bear the major responsibility of providing leadership in the form of improved education and establish minimum standards of proficiency and knowledge. Educational material of good quality is now available. I believe the challenge is to attract instructors with teaching competency and experience and over time to move from voluntary to mandatory education for all first time moose hunters.

Both moose and hunting can only benefit from these initiatives.

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