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Hunting

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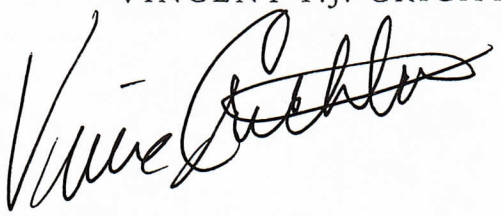


Much that has been recorded in the popular media about moose hunting has been an introduction of the novice hunter to the recreation and a limited source of pointers to the experienced moose hunters. The presentations provide some entertaining reading or viewing, but most offer little in terms of information about the species or ways to improve hunting ability, capability and image. Notable exceptions are two publications produced jointly by the Ontario Ministry of Natural Resources and the Ontario Federation of Anglers and Hunters (Buss and Truman 1990a, 1990b).

The intent of this chapter is twofold. The first objective is to provide readers a better understanding of the total moose hunting experience. The second is to encourage the reader to become a knowledgeable and active participant in local, provincial or state moose management programs, regardless of whether he or she chooses to hunt moose, and to appreciate the many uses and values this renewable resource represents.

Much of what is presented and discussed throughout this book deals with moose biology, ecology, habitat and management. A crucial element that seldom receives adequate attention because of its sensitive and highly dynamic nature is biopolitics—not only moose management but in all aspects of environmental management. Sooner or later, most natural resource users and enthusiasts will be faced with the realities of the biopolitical spectrum.

In particular, moose hunters must attempt to understand some of the subtleties of the relationship between their recreation and the intricate blend of art and science that moose management has become. Hunters and other conservationists, like moose biologists, will not necessarily agree on what is done to manage moose best in particular instances or places, but to assure that favorable management results are achieved, they should be aware of and familiar with the decision-making process and the factors that influence that process.

Hunter and Public Education and Communication

Manager Responsibility

All too frequently, wildlife managers have failed to communicate with the public about moose biology, management and habitat issues, and to espouse the values of the moose resource. Nearly as much as actual management of the resource, such communication is a role and responsibility of the manager.

McKenna and Lynort (1984) observed that only within the past decade or two have wildlife professionals begun to deal with private conservation groups regarding environmentally damaging projects and sensitive issues. Beyond the responsibility of communicating openly with the public, to inform them of circumstances, outlooks and management objectives, managers need to communicate often and effectively to enlist informed alliances for management programs and initiatives in times of resource difficulty as well as times of plenty. Also, sharing information and

A moose hunting camp on a remote northern Manitoba river. Proper planning can make a tent a comfortable home for an extended period. It is important to have an ethic about the camp. Once the tent is down, all evidence of human presence should be eliminated. All combustible material should be burned; biodegradables should be disposed of away from the campsite; and nonbiodegradables carried out for recycling. The area should be left so that someone to follow will likely select the same site. *Photo by Vince Crichton.*

expertise with the public has an unrealized potential in that they can ask, do and say what civil servants cannot (Crichton 1987a). The importance of this issue is illustrated by the fact that the 1984 Federal-Provincial Wildlife Conference in Canada adopted "Communicating about Wildlife" as its 1985 theme.

Mahoney (1983) suggested that biologists/managers must become better readers of the public mind and better registers of politics of the wildlife profession. Moose management programs will only be as effective as the public support they receive. Mahoney added that biologists must become better communicators and more articulate politicians. The benefits include enhanced personal and professional credibility and heightened profile and security of management programs.

Politically motivated decisions that diminish the capability of biologists to communicate reflect lack of recognition or acknowledgment of the public as the rightful owners of the resource (Crichton 1988a). Wildlife managers should view themselves as businessmen or businesswomen with a product and market it effectively. There is public demand for the product, especially charismatic big game. The fact that 86.2 percent of Canadians indicated that maintaining abundant wildlife was important to them suggests there is a broad base of support for wildlife conservation in Canada (Filion et al. 1991). In the United States, 48 percent of 225.5 million citizens 6 years of age or older spent more than 1 billion days and expended nearly $60 billion to participate in wildlife-associated recreation in 1991 (U.S. Fish and Wildlife Service 1993). Those figures indicate a strong public interest in and enthusiasm for wildlife in the other nation within North American moose range.

Hunter Responsibility

Hunters are a minority group in North America and the antihunting movement is well-established and well-funded. To protect against criticism of hunters, hence hunting itself, hunters need to be proficient, safe and socially responsible. Failure to adopt these traits eventually but invariably pro-

vides fodder for those who object to hunting, regardless of the biological, ecological, economic and recreational ramifications. Two papers by Causey (1989, 1993: 82) are recommended reading for all hunters and wildlife managers. The essence of those papers is a defense of hunters, based on their minimum environmental impact compared with that of other human activities. Causey commended hunters' intimate knowledge of natural systems and of nature's rhythms, and their rightful claim to understanding and practicing "bioregionalism long before it became a buzzword of the environmental movement." However, having had extensive experience with hunters and hunting groups, I suggest that some hunters tend to forget about or ignore other resource users, future users and the legitimacy of aboriginal use. They do not recognize the wilderness experience and the satisfaction derived from observing moose and other wildlife interacting with their environment.

In any philosophical discussion of hunting, the notion and practice of fair chase must be included. Moose have not changed for hundreds of years. But the technology to pursue them has changed, and dramatically so, within only the last three decades, with the popularization of such introductions as snow machines, all-terrain vehicles, high-powered firearms, improved ammunition and scopes. These advances and more disposable income make human hunters highly effective "predators." To protect hunting as an ethical and socially acceptable recreation, this technology must not be used in a manner that reduces hunting to an efficient exercise in killing. To do so would be to sow seeds of disrespect for the resource, for fellow hunters and for the legitimacy of other resource uses. For most hunters, the primary pleasures of and motivations for modern recreational moose hunting come not from the kill, but rather from appreciation of nature, comradeship, and the use of hunting skills (Stankey et al. 1973). Success or failure of the harvest influences the type and degree of additional satisfactions experienced by the hunter. For example, as probability of success declines other satisfactions such as general outdoor enjoyment and environmental amenities may be heightened.

Aldo Leopold (1949), widely considered the "father of modern wildlife management," suggested five components or levels of hunting satisfaction, in the following order:

1. A sense of husbandry through application of land management;
2. A perception and understanding of principles of ecology;
3. Simple pleasure of breathing fresh air and having a change of scenery;
4. Feeling close to nature; and
5. Pursuit of game with their associated symbols of achievement.

Every moose hunter knows instances where the actions of fellow hunters do not live up to the opinions or expectations about hunting as espoused by Leopold. But those five components of hunting, I believe, are embraced by a majority of hunters, if not a vast majority. That the misguided and irresponsible actions of a few hunters all too frequently are reported in the press, to the exclusion of mention of ethical hunting and hunters, is unfortunate but predictable. The negative, often sensationalized coverage has tended to implicate all hunters and hunting and caters to those who have political and philosophical agendas opposed to recreational hunting and/or contemporary moose management programs. In large measure because North American society is growing, becoming more urbanized, vocationally specialized, many people are distanced from and unassociated with the rhythms of nature (Wildlife Management Institute 1992). For them, predation in any form is unwarranted violence—an act of inhumanity. Such a view is at odds with the environment, with wildlife science and with hunting, recreational or otherwise. It is anthropocentric naivete, but it also is increasingly prevalent. Heberlein (1991) suggested that the net effect of all forces acting on hunting is that hunter numbers will decline and sport hunting eventually will be viewed as an antisocial act among the most numerous groups in society. He suggested that there is good news in this in that more is not always better. A smaller number of dedicated and knowledgeable hunters may help to improve the recreation's public image and hunting quality and somehow continue to provide the funding base that serves nearly all wildlife management programs.

In the short term at least, hunters need to be cognizant that hunting is an increasingly sensitive social issue, and that its continuation as recreation, management tool for game populations and primary funding base for game and nongame programs alike is and will be predicated foremost on the legal and ethical behavior of hunters themselves.

Ethical hunting behavior is conduct within the parameters of law and in accordance with widespread views of what is collectively respectful of the wildlife, the landscape, the landowners (public or private), the recreation and other hunters, other users of the landscape and the general public.

Ethics change as people's attitudes and societal expectations change in all areas of life (Horwath 1990). Those who hunt usually go through several dispositional phases. The first is the "shooting stage," in which the hunter's primary interest is maximum shooting. Next is the acquisition stage, in which a maximum limit or take of game is of paramount concern. Then there is the trophy stage, in which satisfaction is maximized by a particular type of hunting method, species or animal. Finally, there is the experiential stage, in which one or more aspects of the occasion—camaraderie,

tradition, nature appreciation, etc.—supersede the importance of the chase or kill. Most hunters progress through one or more of those phases, as age, experience, physical conditioning, self-confidence, peer pressure and attitudes dictate. At each stage, ethical standards—usually self-imposed—are increasingly refined and strict.

Although mainly universally applicable, hunting ethics can be specific to the type of hunting (e.g., rifle versus muzzleloader, waterfowl versus moose, wilderness versus shooting preserve). They also tend to be even less flexible than hunting laws and regulations. The balance of this section addresses ethical considerations in moose hunting. The ethical behavior of the moose hunter may not be substantially different from that of the deer hunter or upland gamebird hunter, but it must be adapted to the uniqueness of the species and the species' habitat.

In the establishment of a moose hunting camp for an extended hunt, live trees should not be destroyed. Dry, dead trees make better firewood, tent poles and meat poles. The campsite should be kept free of debris and ultimately left clean with all evidence of occupation eliminated except for tent poles and a replenished woodpile. Tent poles should be leaned against a tree or rock where they will remain comparatively dry and available for future use. All combustible material should be burned. Biodegradable items can be placed in the bush some distance from camp. Tin cans should be washed out, compressed and carried away for recycling; burying is an option, but a poor one.

For moose hunting on private land, permission should be sought and secured well in advance of the season and in full compliance with provincial, state and local access/trespass statutes and landowner wishes. Reporting to the landowner upon departure will go a long way to ensuring his or her accommodation toward hunters and hunting.

There is nothing more upsetting to a hunter seated at a chosen site or more disruptive to a hunt than to have another hunter drive through the bush on an all-terrain vehicle or snow machine. All motorized vehicles should be confined to roads and designated trails. Similarly, hunters traveling by water should paddle or row, rather than motoring past places where others are hunting. Also a motorized vehicle or craft should never be used to haze or stalk moose. Roads and trails can be used to reach a hunting area, but not the specific location for a hunt. In addition, a vehicle should not be parked such that it impedes other traffic.

Gut piles in highly visible places are an eyesore and offensive to others, particularly nonhunters. Wolves, bears, ravens, eagles and other animals eventually will eliminate the remains, but that fact should not preclude sensitivity in making sure those remains are not left where they can invite criticism.

Firearms should be legally and safely cased and kept inconspicuous. Prominent display of firearms is offensive or threatening to some people, and it can invite theft. In Canada, display of a firearm in an unattended vehicle is illegal, and a vehicle or any part thereof containing a firearm must be securely locked.

Respect absolutely must be shown for others' equipment and property. Hunting must not be done in posted logging areas. Also report sign damage to the authorities or landowners.

The sighting-in of rifles should be done away from the hunting area, preferably at a certified range, and on an annual basis before the hunt.

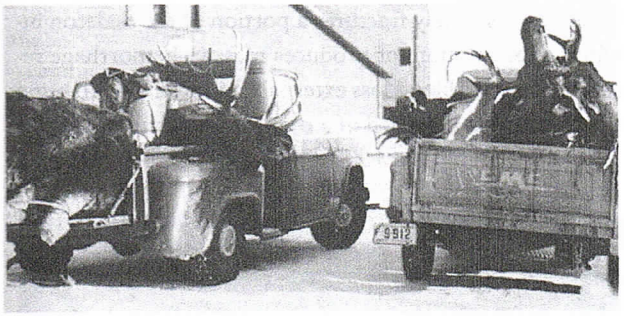
While hunting, animals and other objects at a distance should be viewed with binoculars or spotting scopes rather than with rifle-mounted scopes, because the object might be human.

Most important, all rules of safe firearm handling and hunting must be observed by everyone. A good policy is to have each party appoint a firearm safety person. This individual can remind each hunter to double-check firearms upon return to camp or to vehicles. Hunters must not be timid about informing others (albeit politely) when their behavior is out of line and unacceptable. This applies as well to the use of alcohol before or during a hunt. A hunter must know his or her physical limitations, and conduct themselves in a fashion that will not burden others.

Hunters should notify others of when, where and how long they will be hunting a particular area. A note left readable inside a vehicle is a good practice. Most hunters also should know how to use a compass and orient themselves by a topographical relief map kept in the hunter's possession at all times. Of course, the latest technology—namely geographical or global positioning systems (GPS)—is a useful tool for finding one's way back to vehicles or camps, but hunters must become familiar with these expensive units before using them in the field, where a mistake could result in serious consequences. A knowledge of first aid is highly desirable.

Open display of carcasses during transport impresses no one, and it is disrespectful of the animal, other people and the sport. Few other ethical violations draw as much criticism from nonhunters. Persons who, by action or conversation in public, need to validate their self-professed hunting prowess should be ignored and ostracized. Hunters invariably enjoy the recounting of their experience, but such "sharing" must be done with propriety. Machismo displays and vocalizations merely serve to prove the contrary.

Moose hunters should learn all they can about the habits and life history of their quarry. A knowledge of current moose management objectives and the reasons behind



In the not too distant past, moose hunters commonly displayed their kills openly when returning from the hunt. Today, however, such conspicuous display is offensive to many people, particularly those opposed to hunting. Hunters need to refrain from actions that can reflect negatively on the sport and on hunters themselves, regardless of how innocent the motivations. *Photos by Rhys Beaulieu.*

changes in harvest regulations will enhance the total hunting experience and, through conversation, help others to appreciate the sport. Hunters should not hesitate to ask questions of conservation agency officials and register their thoughts and ideas.

Shots must not be taken at moose under any conditions or circumstances that would prevent a quick, humane kill. Long shots, running shots and obscured shots are not to be taken. Hunters should know, from practice, the capability and limitations of their firearms and ammunition. They also need to know where to aim for killing effect. Even so, wounding is possible. Therefore, moose hunters must know and be fully willing to track a wounded animal. They also should be willing to help others locate such an animal. And in all aspects of the hunt, experienced hunters should give advice, assistance and encouragement to novice hunters.

Hunters who are fortunate enough to down a moose must be prepared to dress out the carcass efficiently and expediently, to avoid waste of meat or other usable parts. This entails knowledge of field-dressing techniques, use of proper equipment and a great deal of energy.

Moose hunters should cooperate fully with wildlife management authorities in completing questionnaires, answering questions in the field or submitting biological specimens, even voluntarily. Management of moose, to the benefit of hunting, is a dynamic science that depends to an important extent on information and cooperation from hunters. In the absence of data or cooperation, management is complicated, and the first casualty is quality hunting.

Ethical hunters have no reason to be ashamed of or apologetic for pursuing their chosen outdoor activity. They should, however, assume a greater role in moose management by showing high regard for the law, respect for wildlife, the environment, fellow hunters and the general public, and by keeping abreast of wildlife programs and policies.

Moose Hunting and the Law

Recreational hunting in North America is a privilege, not a right. All jurisdictions annually promulgate laws and regulations that specify the parameters within which moose hunters must conduct themselves. The intent of regulations is to ensure that the moose resource is used and conserved wisely. The laws enacted are designed to help ensure an equitable distribution of hunting opportunity, prevent inhumane treatment of wildlife, protect private property and provide for safety of hunters and other outdoor enthusiasts (see Chapter 17).

Penalties for breaking wildlife laws and regulations range from a "slap on the wrist" in some jurisdictions to heavy fines, confiscation of hunting equipment and game, termination of hunting privileges for extended periods of time and, in some jurisdictions, restitution fees. Some violations are deliberate; others result from lack of knowledge about provincial or state laws. It is imperative that hunters take the time to read hunting brochures and understand the

pertinent rules, especially changes from the previous year. If necessary, hunters should phone the management authority to clarify policies and laws that may be vague or confusing. For example, in designated route areas in Manitoba, hunters cannot take a vehicle off of such routes until a kill has been made. However, for hunters who have licensed camps in these areas, permits can be issued to travel by vehicle to and from the camp during the hunt even if it is off the route.

Hunt Preparation

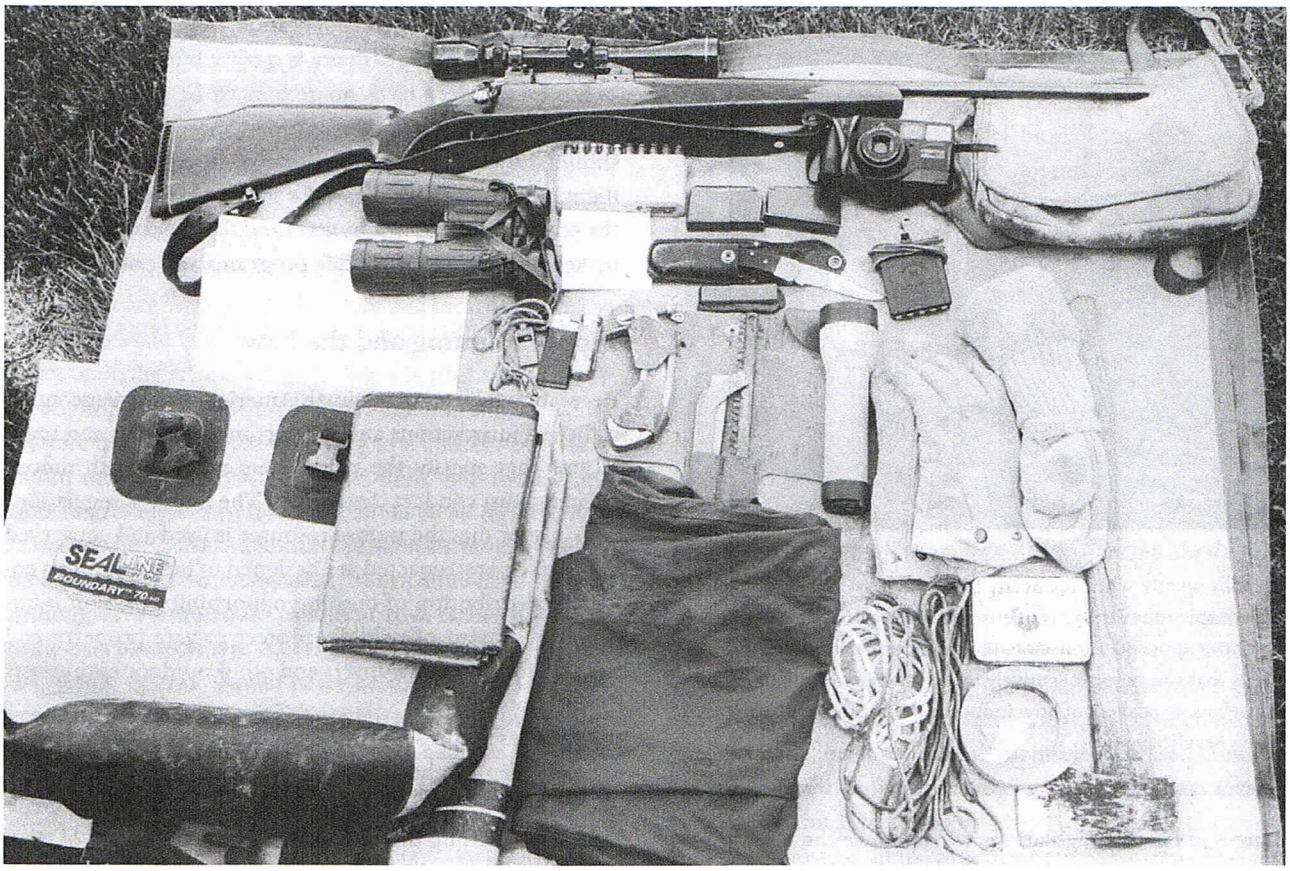
General

Preparation for a moose hunt involves five different types of equipment—firearms and ammunition, clothing and personal supplies, carcass-handling devices, camp gear, and food. Table 63 lists equipment for a four-person fly-in moose hunt for 6 days.

Firearms and Ammunition

Proper preparation for a moose hunt requires the right type of firearm and ammunition. In most jurisdictions, firearms for moose hunting refer to most centerfire rifles, muzzleloaders, and even bows and certain handguns. For moose hunting, minimum calibers or pull weights are prescribed (Table 64). Also, most jurisdictions regulate projectile specifications to ensure adequate killing power and to minimize wounding losses. Most prohibit rimfire cartridges, which lack size, muzzle velocity and impact energy to produce a clean kill.

The firearm projectile kills by doing one or a combination of actions, including tissue (bone) destruction, hydrostatic shock and hemorrhage. A lethal shot is one that damages an organ essential to maintaining life (heart, lung, liver, brain, etc.), severely fractures a portion of the skeleton inhibiting locomotion, or produces massive hemorrhage resulting in major blood loss externally or internally. To bring down an animal the size of a moose, a firearm must fire a



Essential gear for a day-hunt for moose includes a firearm, gloves, knife, binoculars and a waterproof knapsack containing ammunition, spare ammunition clip, matches in waterproof container and/or lighter, flagging tape, rope, small axe, sharpening stone, first aid kit, flashlight, camera and film, topographic map, compass, extra socks, hunting license/tag, survival (space) blanket, snacks, and a container of drinkable water. *Photo by Vince Crichton.*

Table 63. Recommended logistics for a 6-day, fly-in, four-person moose hunt

General

- Preparations should begin *at least* 6 weeks before the hunt
- Secure all licenses and permits
- Review all pertinent regulations
- Obtain topographic maps (one for each hunter) of the area to be hunted
- Sight-in firearm with ammunition to be used on hunt
- Clean and waterproof boots, tents and other gear
- Improve physical conditioning
- Make and confirm prehunt travel arrangements, including check on firearm/ammunition casing requirements
- Sharpen knives, saws and axes
- Identify butcher, tanner and taxidermist, as desired, for price list and special handling recommendations
- Acquire traveler's checks/cash
- Replenish propane tanks and other fuel tanks
- Clean and check camp stove and lanterns
- Preplan daily menus

Personal

- Firearm and ammunition
- License/permit
- Sleeping bag, air mattress (or similar type material) and pillow
- Tent and ground cloth
- Repair kit for air mattress and rubber boots
- Toothbrush, toothpaste, biodegradeable soap and other toiletries (no aftershave or scented deoderant)
- Two towels and face cloth
- Hip waders
- Bush boots (leather boots not recommended unless waterproof)
- Camp shoes or slippers
- Two pair of long underwear and suitable summer underwear for 8 days
- Three heavyweight shirts
- One sweater or hooded sweatshirt
- Two pair of insulated mittens or gloves
- Cap or hat (preferably with ear covering)
- Insulated coat, parka or jacket of wool or other "soft" material (not nylon)
- Two pair of pants for bush use (wool or "soft" material) and one pair for camp
- Three pair of wool socks and three pair of undersocks (silk, polypropylene or cotton)
- Warm vest with a soft outer covering (not nylon)
- Sunglasses
- Life preserver
- Raingear
- High-quality compass with lanyard
- Day bag (knapsack)
- Matches, match container and lighter
- Binoculars
- Camera equipment and film
- Pocket first aid kit (Band-Aids, bandages, tape, antiseptic, aspirin, etc.)
- Pocket sewing kit
- Flashlight and extra batteries
- Moose call(s)
- Breakdown fishing gear (no more than two units for a party of four)
- Pocketknife
- Shotgun and shells (one per party)
- Firearm cleaning kit (one per party)
- Blaze orange (or other color) vest, hat or outer garment to minimum specification
- Wind-up or battery-powered alarm clock
- Water purification kit (one per party)
- Small radio (optional) and batteries
- Space blanket
- One medium and one large dry sack
- Pint or quart plastic water bottle
- One bottle of fly dope
- Ballpoint pen and notepad
- Toilet paper, paper towels and facial tissue
- Flagging tape

Field dressing

- Medium-sized hunting knife and sharpening stone
- Light, strong rope (25–50 feet [7.6–15.2 m])
- Nylon string (5–10 feet [1.5–3.0 m])
- Meat saw, with extra blade (collapsible Wyoming saw recommended)
- Small block and tackle and come-along
- Lightweight external frame backpack or stretcher (for carrying meat and gear)
- Cheesecloth or T-shirt tubing sacks
- Large burlap bags (for transporting meat to camp)
- Nylon bags with 1/16-inch (0.16 cm) diameter holes (to place around hanging meat)
- Small axe (hatchet)
- Heavyweight plastic sheeting or tarp (to keep rain/snow off meat)
- 3 pounds (1.4 kg) of salt (for hide preservation)

Food

- Eight loaves of bread
- Pancake mix
- One bottle of syrup
- Five dozen eggs
- 4 pounds (1.8 kg) bacon wrapped in 1-pound (0.45-kg) packages, and an equal amount of breakfast sausages wrapped similarly
- 3 pounds (1.4 kg) butter or margarine (margarine remains soft in cold weather)
- Jam or jelly
- Sugar
- Tea bags
- Coffee
- Canned milk/Coffee-Mate or hermetically sealed whole milk for tea and coffee
- Four packs of orange juice crystals
- Luncheon meat—about five tins of packaged meat (luncheon foodstuffs can be minimized if the party opts for brunches rather than breakfasts on some days)
- Mustard and ketchup
- Salt and pepper
- 4 steaks (one meal)
- 8 pork chops (one meal)
- Premade chili (one meal)
- Premade stew (one meal)
- 4 pounds (1.8 kg) of burger in 2-pound packages (two meals)
- Premade spaghetti sauce and spaghetti (one meal)

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Table 63 continued

- Food for one other major meal—optional—perhaps plan on catching some fish
- Salad makings (two heads of lettuce, eight tomatoes, three cucumbers, green onions, etc.) and dressing
- Two dozen chocolate bars
- 12 oranges
- 15 apples
- Large sack of dried fruit (raisins, apricots, prunes, etc.)
- 15 small commercially prepared puddings
- 2 or 3 pounds (0.9–1.4 kg) of cookies
- One box of Minute Rice
- 16 potatoes
- Frozen vegetables for eight suppers
- One container of cooking oil
- Premixed ingredients for bannock
- 30 cans or eight plastic containers of soft drinks
- Powdered fruit drink (e.g., Tang)
- 4 pounds (1.4 kg) of munchies (chips/peanuts)
- 4 pounds (1.4 kg) of trail mix or gorp
- 2 pounds (0.9 kg) of cheese (in a block)
- Two boxes of crackers
- Two or three large onions
- Eight packets of soup mix
- One 10- by 12-foot (3 X 3.6 m) or 12- by 14-foot (3.6 X 4.2 m) dining, storage tent, plus two smaller lightweight tents each to sleep two (larger tent should have a fire-retardant ring for stovepipes and a pad and ring to hang a lantern on; rings and rope on ceiling useful for drying wet clothing)
- One "fly tarpaulin" to cover the tent (lightweight nylon tents usually come with attached fly)
- One 10- by 12-foot (3 X 3.6 m) lightweight tarp (not canvas) for tent floor
- Three 10- by 12-foot (3 X 3.6 m) lightweight tarps for construction of cook "shack" and covering meat
- Two boxes of wooden matches in waterproof containers
- Five plates, cups, knives, forks, small spoons, large spoons
- Two fry pans
- Five cereal-type bowls
- Four bowls for keeping food warm
- Tea and coffee pot
- Spatula and butcher knife
- Three large cooking pots (lightweight, aluminum cooking kit with nesting of various sized pots/pans recommended)
- Plastic wash basin for dishes
- Plastic wash basin for personal hygiene
- 1-pound (0.45-kg) portable solar shower• Large pot for heating water on open fire
- Collapsible 3- to 5-gallon (11–19 L) plastic bucket-bag, with handle, for drinking water
- Water pail
- Shovel
- Grill for use on open fire
- Two-burner camp stove
- Folding camp stove—folded size = 12.5 by 27.5 by 3.5 inches (31.3 X 68.8 X 8.8 cm), weight = 12 pounds (5.6 kg)—with oven and enough stove pipe for use in large tent
- Two lanterns
- 2 or 3 gallons (7.6–11.4 L) of lantern/stove fuel
- Small funnel
- Four spare lantern mantles
- Two axes with protective shields
- File
- Small chainsaw fully fueled and oiled, or bucksaw
- 0.5 gallon (2 L) of gas for chainsaw
- 1 quart (1 L) of chain oil
- Two aluminum square-stern canoes
- Two small outboard engines (5 horsepower maximum), spare plug(s) and shear pins
- 10-gallon (40 L) drum of mixed gas for engines (0.5-gallon [2-L] plastic drink containers are ideal for carrying mixed outboard gas in the canoe and putting in engine)
- Five canoe paddles (one is spare)
- Small tool kit (wrench, screwdriver, pliers, etc.)
- Roll of heavy-gauge vapor-barrier plastic (light, cheap and storable in bush)
- Five garbage bags—burn all garbage that can be treated this way; that which is biodegradeable should be placed in the bush away from camp and tins and bottles are to be brought home for recycling or proper disposal
- Two dish towels
- One dish cloth
- Five scouring pads
- 20 3-inch (7.5-cm) nails and spikes (for hangers and game pole and table construction)
- Roll snare wire
- Roll of duct tape
- First aid kit

projectile heavy enough to break bones and penetrate vital areas, large enough to cause maximum tissue damage, achieve velocity to impart maximum shocking power, expand and not disintegrate on impact.

The potential killing power of any firearm is determined by the impact energy of the bullet. The minimum projectile energy recommended for moose is 2,100 foot-pounds, with 3,500 foot-pounds preferred. To achieve this energy, bullets with 180 grains of powder are recommended. In recent years the .30-06, .308 and .300 Winchester magnum have replaced the once popular .303 and .30-30. Given the aforementioned energy range, calibers from .270 and higher are acceptable for conditions that most moose hunters will experience. Magnum cartridges extend one's range by about 100 yards (91 m), but in the boreal forest where most moose hunting occurs, shooting distances rarely exceed 100 to 150 yards (91–137 m). Shots exceeding 250 yards (229 m) are ill-advised and generally unnecessary.

Bullet weight and construction are extremely important and frequently overlooked considerations of inexperienced hunters. High-velocity, small caliber bullets, such as .243, often will disintegrate on impact and are less effective on moose because of their inability to penetrate, especially when used by hunters without knowledge of proper shot

Table 64. Minimum specifications for firearms, including bows, and projectiles for hunting moose in North America, 1995

Province or state	Rifle Caliber (projectile)	Muzzleloader Caliber (projectile)	Shotgun Gauge (projectile)	Handgun Caliber (projectile)	Bow Pullweight (projectile head)
Alaska	> .22 rimfire	.54, .45 (with 250 grains)			Cast arrow 175 yards (⅞ inch width)
Alberta	.23 (case length 1.75 inches, no full jacket)	.44	28	Prohibited	40 pounds (1 inch width, barbless, 2+ blades)
British Columbia	(no rimfire)		Prohibited	Prohibited	40 pounds (⅞ inch width)
Colorado	.24 (no full jacket)	.50	20 (slugs only)		(⅞ inch width, two cutting edges)
Idaho	(no rimfire)	.50			40 pounds (⅞ inch width)
Maine	.24 (no full jacket)	.50	20 (slugs only)		(⅞ inch width, two cutting edges)
Manitoba	center fire only (no full jacket)	.45	12 (slugs only)	Prohibited	40 pounds (⅞ inch width)
Minnesota	.230 (no full jacket)	.45	(slugs only)	.23 (1.285-inch casing)	40 pounds (⅞ inch width, barbless, two cutting edges)
Montana		.45			(no chemicals, no explosives)
New Brunswick	.23		(slug or BB)	Prohibited	44 pounds (0.8 inch width, barbless)
Newfoundland	.23 (100 grains, no full jacket)		20 (slugs only)	Prohibited	44 pounds (two cutting edges)
New Hampshire	.230 (no full jacket)	.40 single-shot			60 pounds (⅞ inch wide by 1½ inches long)
Northwest Territories	.23 (no full jacket)			Prohibited	44 pounds (1 inch width, barbless, no explosives)
Nova Scotia	.23	.45	28 (slugs only)	Prohibited	50 pounds
Ontario	(no rimfires)			Prohibited	40 pounds (⅞ inch width)
Quebec	.243 (no full jacket)	.50 (ball)	Prohibited	Prohibited	40 pounds (⅞ inch width)
Saskatchewan	.23 (no full jacket)	.45	20 (slugs only)	Prohibited	40 pounds (⅞ inch width)
Utah	.240 (no full jacket)	single-barrel (210 grains, no sabots)	20 (slugs only)		40 pounds (⅞ inch width, barbless, two cutting edges, no explosives, no chemicals)
Washington	.240 (85 grains, no full jacket)	.50 single-barrel (170 grains, no jackets, single projectile)	Prohibited	.24 (750 foot-pounds at 100 yards)	40 pounds (⅞ inch width)
Wyoming	.230 (no full jacket)	.40 (50+ grains black powder)		.41 (500 foot-pounds at 100 yards)	50 pounds, cast arrow 160 yards (1.0 inch width)
Yukon	.24 (no full jacket)	.45 (ball)	20 (slugs only)	Prohibited	45 pounds

Essential equipment for handling a downed moose includes a knife and sharpening stone, saw, axe, camera, tape measure, hipwaders (if moose falls in water), rope, cloth bags for covering meat, and a backpack for transporting the meat and desired parts to camp. Even with all this gear, the best thing to have for field dressing a moose is one or two willing assistants. *Photo by Vince Crichton.*

placement or ability to achieve such shots. Effective bullets are partitioned, expand on impact but do not disintegrate and are capable of penetrating into and through vital organs. Bullet construction is a significant contributor to the effectiveness of any shot. Controlled expansion of the bullet, which transforms the energy of the bullet into tissue damaging and shocking power, is recognized as necessary to produce a quick kill. This is acknowledged by most jurisdictions, and some prohibit the use of fully jacketed bullets, which do not expand and are capable of passing through an animal without doing sufficient damage to kill immediately.

Before a choice of caliber is made, careful consideration should be given the rifle's action—bolt, lever, pump and semiautomatic. The choice is a matter of personal preference, based on handling comfort and efficiency, balanced against such factors as type(s) of use and maintenance (e.g., hunting conditions, durability, repairability). Bolt-action rifles offer the widest range of calibers, but shooting and hunting experience *and* trial with various actions should dictate the decision. The quicker a firearm can be shouldered and accurately aimed, the more confidence the hunter will have in hitting the target. Style and bulk of clothing to be worn while hunting should be factored into determinations of a gun's "fit." An experienced gunsmith can assist with fitting for a gun and firearm adjustments accordingly.

I do not recommend the use of shotguns and muzzleloading firearms for moose hunting primarily because of the significant drop off in energy after 82 yards (75 m). However, hunting with these firearms, especially muzzleloaders, is becoming increasingly popular. Those who choose to hunt in this fashion must be experienced, prepared to work to get close for killing shots and willing to pass up shots at moving targets and animals that are at or near the range limits for these weapons. Regardless of more liberal allowances by some provinces and states, the advised

minimum caliber for muzzleloader hunting of moose is .50, and at least 90 grains of powder should be used.

Archery equipment is only effective in the hands of individuals with excellent knowledge of the quarry, the hunting area and limitations of the equipment. The choice of bow type—long, recurve or compound—is a matter of the hunter's personal preference, physical capabilities and experience. Regardless of bow type, the minimum advisable draw weight for moose hunting is 45 pounds. Because the heavy bones and thick hide of moose can slow, impede or deflect arrow flight, hunters should use the heaviest draw weight they can handle and at which they can be consistently accurate. And regardless of bow type *and* draw weight, shots should not be taken at moose more than 25 to 30 yards (22.9–27.4 m) distant and unobstructed. The foremost consideration for shot distance and placement is that the animal must not be wounded and lost. Moose seldom are killed on the spot by an arrow shot, so the stalking, shooting and trailing skills of the bow hunter must be highly refined.

Arrows do not provide the hydrostatic shock associated with firearms and killing is dependent on arrow placement, speed and the cutting effect of the blade(s). Blade sharpness is critical. It is imperative that blades be kept razor sharp—anything less would be irresponsible and unethical. At minimum, arrowheads should have at least two sharp, unserrated, barbless, straight-cutting, steel-edge blades, and be at least 7/8 inch (22 mm) at their widest points.

There are no Canadian jurisdictions that allow hunting with handguns. Handguns are legal in only four states and their requirements vary as to caliber and energy. Handgun hunting, particularly for moose, is not for novices with such weaponry, regardless of experience with other firearms.

Regardless of the type of firearm and projectile a moose hunter chooses, he or she must gain familiarity with both, by practice, well before the hunting season. Sighting-in a firearm seldom constitutes adequate practice. Even the most experienced moose hunters are inclined to shoot upwards of 100 rounds on at least two occasions to get the feel of the gun, adjust to its recoil, regain reloading efficiency and improve marksmanship. The firearm and exact ammunition type and load to be used while hunting moose should be used in practice. Also, as much as possible, the same clothing as on the hunt should be worn.

With modern rifles, practice should be done at stationary targets 50, 100, 150 and 250 yards (46, 91, 137 and 229 m) away, to ascertain accuracy, possible mechanical adjustments and gain distance perspective through the scope or open sights to be used in the field. For shotguns and muzzleloaders, recommended practice target distances are 50 and 100 yards (46 and 91 m). For handguns and bows, target distances of 20 and 40 yards (18 and 37 m) are recommended. Whether or not sights need to be adjusted to get a tight, centered shot-group, hunters must know how to adjust them should the firearm scope or sights require alignment in the field.

Also, after the firearm is sighted in, practice shooting should be from prone, kneeling, seated or braced positions, except for archery. One or more of these will simulate shots taken on a hunt, inasmuch as offhand shooting for moose is generally considered bad form and rarely necessary (see Buss 1990, Buss and Richard 1990).

Other firearms equipment a moose hunter should consider includes a sling, scope caps, quality travel and carrying cases, a waterproof ammunition container, a spare clip and a compact cleaning kit, including oil cloth.

Clothing and Personal Supplies

Whether moose hunting is done during the autumn rut period or during winter, as legal seasons permit, hunters should prepare for weather extremes. Throughout the North American moose range, autumn/winter weather is unpredictably variable. The type of hunting to be under-

Before shooting at a moose, a hunter should use a natural rest or assume an often-practiced shooting position. A well-placed shot is likely to put the moose down quickly enough to avoid lengthy tracking and potential loss of the animal. Selection of a firearm and ammunition of adequate killing power and practice with both are essential. Firepower will not compensate for a poorly placed shot. *Photo by Vince Crichton.*

taken will dictate what to wear. Still-hunting dictates a different type of clothing than does tracking or stalking. In situations where a hunter is liable to sweat, some form of fabric worn next to the skin to absorb or "wick" perspiration is recommended. Conversely, still-hunting necessitates clothing with especially good insulative qualities. In any case, layering of clothing is advisable.

The outer shell or jacket should be constructed of wool or other similar fabric that makes little noise when the hunter moves. Outer clothing made of nylon and certain other synthetic material can alert moose to a hunter's presence; moose have extremely good hearing. Wool pants are an excellent choice, because they trap warmth, are quiet and do not readily freeze.

Several pairs of mittens or gloves and boots are essential. For suitable hand warmth, I prefer mitts with wool liners. Leather boots, unless they are absolutely waterproof (and few are), are not recommended as a moose hunter usually (and often) is in wet areas. I prefer insulated rubber-bottomed boots with leather tops. Hip (preferred) or chest waders are a distinct advantage and invariably come in handy if animals are pursued and taken in wet areas.

Many moose hunting seasons are long, and hunters should be prepared for weather extremes. Accordingly, clothing is advisably worn in layers. The technique(s) of hunting will dictate how a hunter should dress. Still-hunting for extended periods necessitates well-insulated clothing. On the other hand, stalking dictates that clothing worn next to the skin have absorbent features. In terms of color, hunter orange is best for safety, and there are some jurisdictions that require outerwear of this color. In Manitoba, for example, one must wear a minimum of 400 square inches (2,580 cm^2) of hunter orange or blaze orange visible on all sides above the waist, and also a blaze orange hat. If uncertain about clothing color requirements, hunters are well-advised to consult with the local wildlife management authority. Bow hunters may choose to hunt in camouflage clothing but when traveling to and from hunting locations, blaze orange should be worn for safety purposes. Raingear is an important element of a moose hunter's apparel. I prefer a two-piece suit made of material that is durable and allows perspiration to escape. There are many different materials that are suitable, and I suggest that economy not preempt quality when it comes to the purchase of raingear.

Other important items to be carried in the field are a high-quality compass, matches and/or a lighter, an axe, extra socks, a map of the area, first aid kit, water bottle (filled), flashlight, lightweight binoculars, and a survival (space) blanket. All of this should fit in a waterproof backpack or fanny pack, along with food for the day. Some hunters choose to carry a camera. Some carry a flare or two, and some tote pepper spray in case of chance encounter with a bear. And, of course, hunters must not forget to carry a properly signed hunting license.

Carcass-handling Devices

To field dress a moose, the minimum amount and type of equipment needed includes a medium-sized (4- to 6-inch [10–15 cm] blade) hunting knife, sharpening stone (knives should be sharpened before going afield), 16 to 20 feet (4.9–6.1 m) of strong, light rope, a meat saw, a compact block and tackle, flagging tape to mark the trail to a downed animal and a pack frame. Field dressing technique is discussed later.

Various devices, ranging from lightweight wheeled vehicles to stretchers, have been constructed to ease removal of carcasses from the bush.

Cheesecloth is useful for protecting meat, as are paper shrouds (specifically designed for covering meat). Instead of cheesecloth, which frequently tears and through which flies can penetrate, I prefer T-shirt tubing that stretches. This can be made into bags 1.5 yards (1.4 m) in length to cover each quarter totally.

For hanging moose quarters, I construct loose-fitting 1/16th-inch (2.5 cm) nylon mesh bags measuring 2 yards (1.83 m) wide by 1.5 yards (1.37 m) deep. The mesh is sown along both sides, with Velcro™ on the top. Then, this "sock" can be readily pulled over quarters hanging on a meat pole, and the Velcro™ fastened around meat hooks or ropes holding the quarters. This has the important advantages of letting air circulate but keeping flies away from the meat.

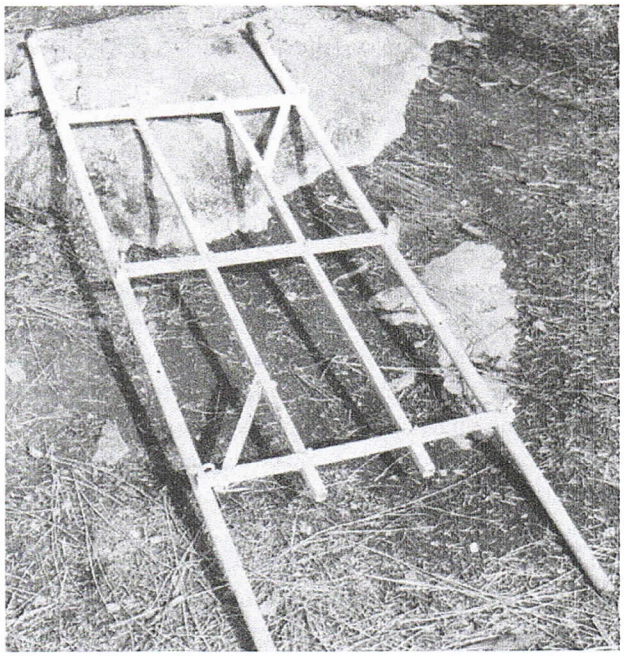
Camp Gear

If camping is part of the experience, a small air-tight heater or folding cook stove is useful for warmth, drying clothes and cooking. Tents should be modified to accommodate such a heater.

Tents should be high quality. Cheaper, same-size models are available, and many a hunter has come to rue the day he economized on this equipment. High-quality tents are those designed and tested for worst-case weather conditions. They should include a fly, ground cloth and, preferably a vestibule or awning.

Like tents, sleeping bags should be weather-rated for as cold as the hunter is likely to encounter. And in the absence of cots or other bedding platform, a thermal mattress is necessary.

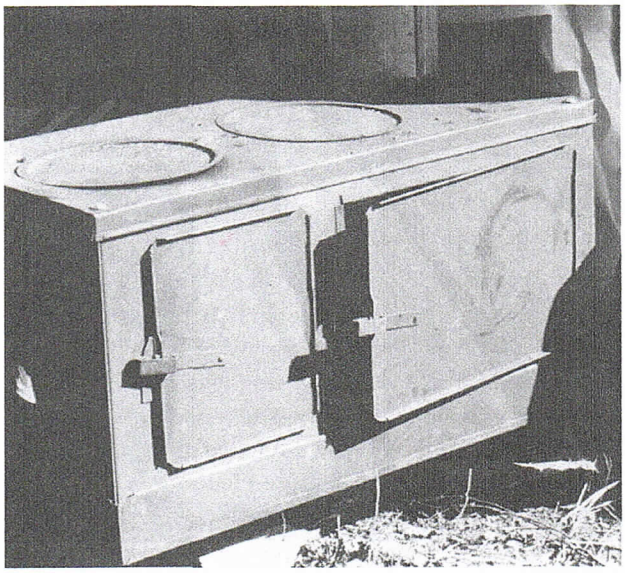
A second cook stove, one lantern per three hunters in camp, a camp shovel and wood saw, metal grill, waterproof containers for extra gear, foodstuffs and cookware are ad-



A lightweight stretcher (left) constructed by the author is of great value in removing moose meat from the bush, especially in rough terrain (right). The stretcher weighs only 8 pounds (3.6 kg) and is 2 feet (0.6 m) wide by 6 feet (1.8 m) long, fastened together with carriage bolts. Careful and clean handling of the meat in the field will provide a quality product with excellent taste and nutrition. *Left photo by Vince Crichton. Right photo by Dana Slusar.*

visable equipment. Also, many experienced moose hunters carry and store extra gear and clothing in rubberized, waterproof tote bags designed specially for cold and wet weather.

A separate container at camp should contain extra matches, an emergency flahshlight, flares, area map, first aid kit and emergency rations. Other items that should be on hand include water purification device or tablets, extra flashlight batteries, gallon-size plastic ziplock bags, toilet paper and heavy-duty trash bags.



A small, collapsible stove for heating and cooking is a valuable asset on extended moose hunting trips. In addition to the firebox, the stove above has an oven. Fully erected, it measures 14 by 24 by 16 inches (36 X 61 X 41 cm). Any stove needs proper venting with sturdy pipe. *Photo by Vince Crichton.*

Food

Many moose hunters seek remote areas to get away from crowds and to enjoy the wilderness or pristine aspects of the hunting experience. Consequently, many hunting trips are for extended periods of a week or more. Logistically, this means minimum carry-in weight and bulk of provisions. To illustrate such economy, I offer my own experience with a four-man hunting group.

With the moose hunting season opening on a Monday, our group's desire is to fly to our chosen site on a Saturday morning and come out the following Sunday. Planning begins with a tabulation of the number of breakfasts, lunches and suppers required. Without proper planning, extra food would be taken and never used, representing unnecessary expense, energy and inconvenience. Breakfasts, for example, are simple and sufficient fare—pancakes, bacon and eggs, sausages and coffee or tea. For other meals, and in the interest of reducing costs and saving space, foods can be prepared and frozen at home, and packaged by meal clearly noted on the containers. Fresh meat can be vacuum-sealed and subsequently frozen. If it thaws, spoilage is not likely to

occur during the course of our hunt if kept properly cool. Frozen foods are well wrapped in newspapers and placed in a cooler with ice packs or dry ice.

At the camp site, a hole for the cooler is dug in the ground in a dry, shaded site. This is covered with the surface layer of material from the hole. Wrapping the cooler in plastic assists in keeping it relatively clean. In this manner, meat usually remains frozen. Frozen foods are better than canned goods because they are lighter and reduce the amount of trash to be carried out. Frozen vegetables are packed in reusable ziplock bags in meal-sized portions. Items, such as sugar, salt and pepper, are placed in small containers. Another container has an assortment of apples, oranges and chocolate bars to carry into the field.

By careful planning and advance preparation, an adequate amount of food can be taken without burden or excess. Meals also may be supplemented with fresh fish or gamebirds, for which separate licenses are needed. Other food suggestions are given in Table 63. And, if a member of the party is successful in taking a moose, a meal of fresh liver or boiled tongue is a delicacy. Finally, extra lightweight rations should be taken for emergency purposes, in case of being weathered in.

The food list will determine what is required to prepare and eat it and clean up afterward, including knives, forks, spoons, plates, cups, cooking pots, tea/coffee pot, water pail, gas stove, fry pan, wash basin, dish cloths, drying towels and biodegradable detergent.

Vehicles

The use of vehicles and aircraft for hunting purposes is unethical and illegal in most jurisdictions. The use of vehicles for transportation to a hunting area, by way of designated roads or trails, is acceptable. But they then should be parked and left. The use of all-terrain vehicles should be restricted to transporting hunters from the campsite or the location where cars or trucks are parked to the hunting area and removing animals from the bush by the most direct and expeditious route possible.

It is illegal in most jurisdictions to shoot swimming animals and to shoot from motorized watercraft unless they are anchored or not under power. Hunters should realize that it is a formidable task to remove a downed moose from the water. Aluminum or fiberglass canoes offer the greatest durability but have the disadvantage of being noisier than wood and canvas canoes. If an aluminum canoe is the craft of choice it ought to be painted a dull camouflage color to prevent reflections. When a motorized boat is not in use, a cover over the engine also prevents reflections.

Under no circumstances should motorized equipment be used to locate or pursue a moose (or other game). This is illegal, and more so, it violates the spirit and fact of fair chase.

The Hunt

Calling

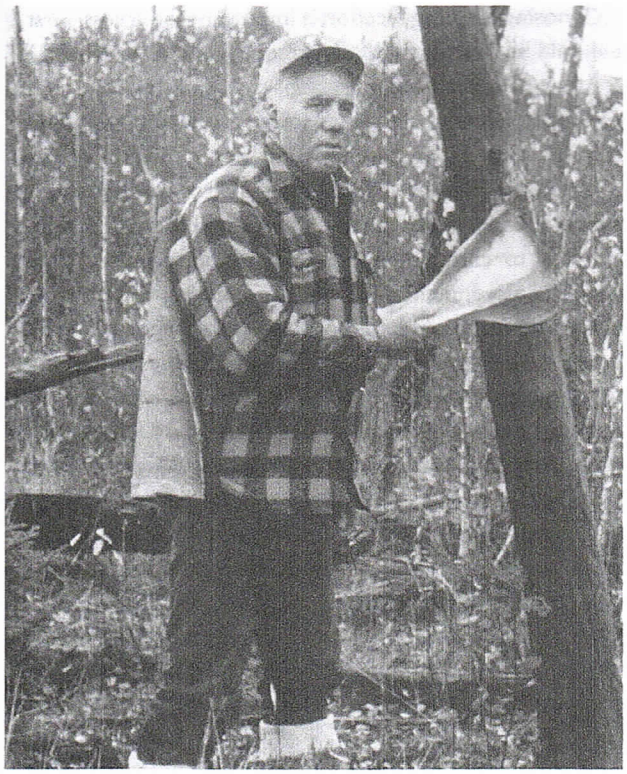
Calling moose during the rut period is considered by many to be an ultimate challenge. This technique appears to be unique to North America; in northern Europe, the drive technique is principally used. The purpose of calling moose is to lure an animal within range, rather than search for one.

There is no single "right way" to call moose, but a number of techniques work. They can be learned by listening to commercially available records or viewing videotapes, and practicing.

It is important to remember that bulls come to the "point of call" and have an uncanny ability to detect the precise location. Calling in the evening while preparing or eating supper can result in a "moose in camp" within an hour. It also can result in a midnight visit. Another reminder is that rutting moose are very aggressive.

Hunters also should be aware that moose do not vocalize when and where wolves are howling, and are not likely to be enticed by calls.

Instruments used to call moose include (from left) a birch bark horn, canoe paddle, shoulder blade from a moose and tin can call. Experience and practice will determine which device is most useful in various circumstances. Novices can learn how to call moose by watching commercial videotapes of the art or by studying with an experienced caller. *Photo by Vince Crichton.*



A moose shoulder blade rubbed against a tree or log simulates the sound of a moose raking its antlers on bushes, and can lure confrontational bulls during the rut. The shoulder blade can be conveniently carried in the field by attaching a piece of string to it through a small hole drilled through the narrow end and tied to the hunter's belt. A good source for moose scapulas is a butcher who processes wild game in moose country. Note that the hunter carries a birch bark horn by a strap over the shoulder. *Photo by Scott Crichton.*

There are a number of devices that can be used to call moose. The most traditional is the birch bark horn, but other devices such as a tin can (preferably, a quart or liter juice or coffee can), the shoulder blade from a moose and even a paddle are used with success.

Birch bark horns can be purchased commercially or made from a moderately heavy fiber material (a piece of rigid vacuum cleaner hose or similar type tubing and even plastic baseball bats with both ends cut out also will work). To fashion a birch bark horn, bark should be selected from a tree that is removed from highly visible areas. It is easily removed in spring, and can be sown together with spruce root or a piece of leather lace or glued with a glue gun. Construction begins with a piece of bark that is folded so that the inside is on the outside of the horn and folded into a conical shape 12 to 30 inches (30.5–76.2 cm) long. I prefer one about 24 inches (61 cm) long. The diameter of the opening for blowing into is about 1 inch (2.54 cm), with the opposite end opening about 8 inches (20.3 cm) in diameter. Once folded properly and glued at two or three points to ensure the shape is held, the horn can be sewn at the seams with the aforementioned material or glued along the edge of the bark. Adjustment of the calling end may be made with a sharp knife. I use a horn made in this fashion. It has lasted for 12 years and, with care, will last for many more. I carry a small roll of electrician's tape in my day bag for emergency horn repairs in the field. Posthunt repairs are made with a glue gun.

A tin can call is constructed by removing one end and placing a small hole in the center of the other. A thin piece of rope (sideline) about 0.375 inch (0.95 cm) in diameter, leather thong or skate lace about 30 inches (76.2 cm) long is knotted and threaded through the hole from the inside out. The can should be wrapped with tape to prevent reflections and to muffle the "tinny" sound. It is preferable to wet the line or apply spruce pitch to it before pulling. Wearing a glove ensures that fingers are not abraded by the friction. By pulling the line between the thumb and forefinger, the moaning sound of a cow can be produced. It is amplified by the can chamber. Short, jerky pulls can simulate the grunt of a bull.

A moose scapula (shoulder blade) is another device I like to use. For carrying, a short piece of string is attached to the blade by means of a small hole bored through the narrow end. Shoulder blades from cattle do not work well because they are smaller and of heavier bone, which does not resonate when rubbed on trees. The blade of a canoe paddle also can be used in place of a moose shoulder blade. Some hunters rattle antlers together to simulate the clashes of sparring or fighting bulls.

Calling moose is most effective during the rutting period, toward the end of September. In Manitoba, about 84 percent of the cow moose are bred between September 20 and October 7 (Crichton 1992c), with the mean breeding date being September 29. In most moose populations, breeding occurs at about this time (see Chapter 4). However, it is possible to call moose through October, but the response is not as intense. I have called moose as late as October 25, and have had reports of bulls still engaging in combat in mid- to late October.

Moose call during the winter hunting period (early December), but my experience suggests that this call (of the bull) is entirely different from vocalizations made during the rut period. It more closely resembles a cough or bark than the deep guttural grunt heard earlier, and probably is an alarm in response to the hunter's presence. Calling for moose at this time is essentially useless—tracking is a better technique. I have been informed by some hunters that they have heard cows calling in the winter hunting period, but have been unable to corroborate these assertions.

Moose reply to a call at any time of the day, but early morning and late afternoon are best. Compared with warm, windy or rainy weather, still and cool or frosty weather produces the best results. In windy weather, the call does not carry. Also, moose have a tendency to retreat into heavy cover during windy conditions. Another disadvantage is that the hunter may not hear approaching moose, and unless he or she is situated in an ideal location, the moose likely will circle and pick up his or her scent.

Many hunters believe that when moose do not respond to calls during poor weather conditions, they are not in the rut. Nothing could be farther from the truth. Females usually are receptive for less than 24 hours and if not bred at this time they will ovulate again in about 24 days (Schwartz 1992c; see Chapter 4).

Calling moose should be done from a site that offers concealment and good visibility. The general area first should be searched for evidence of recent moose activity. The calling site should allow the hunter to relocate with concealment according to the direction from which a moose approaches. Before the commencement of the rut, calling is not very effective. But during the rut moose reply to calls at any time of day, but particularly in early morning or late afternoon. Windy conditions are not ideal for calling, but will produce results if the wind is favorable. A birch bark horn merely amplifies the sound made by the caller, so it is important that one practice and gain proficiency of the appropriate vocalizations before going to the field. *Photo by Scott Crichton.*

Choosing a calling location is important to success. First, it should be in an area that represents good moose habitat and may have moose sign, such as tracks, thrashed bushes, wallows or recent browsing. However, the absence of visible sign is not proof that moose are not in the area or cannot be called. The site should offer good cover and visibility, and be near open areas where the call will carry. Trees that are easy to climb offer excellent visibility. But caution should be used in climbing trees and pulling up a firearm, which certainly must be unloaded. I always spend time before and during a moose hunt acquainting myself with the hunting area. I learn where well-used trails are and find potentially new and alternative calling sites.

Beaver ponds (dried or active), open grassy meadows, and points jutting out from the shore of lakes and rivers are particularly good calling sites. The site also should offer some opportunity to move about. Generally, moose move when calling. However, I have observed cows calling from the same location for 3 to 4 hours, at intervals varying from 5 to 10 minutes. At some of my chosen calling sites, I can move quietly about 50 yards (46 m) in several directions, call and then move back to my waiting post until the next calling time. This mobility enhances the range and direction of calls, as well as simulating reality.

A horn does not "make" the call, it merely amplifies the sound the hunter makes. And the hunter has a choice of two calls to imitate—that of a rutting bull or that of an estrous cow. I prefer a cow call because it is louder and, more important, I believe, entices bulls more readily than do bull calls to combat.

A calling area always should be entered and departed as quietly as possible. After calling, the hunter should stay well hidden, because bulls have an uncanny ability to come to the point of call quietly and with no vocalizing. Smoking or talking should be discouraged, and shiny items should be out of sight.

In the morning, I prefer to be in my calling location at least a half hour before legal shooting time. The cow call should begin with an amorous call—a soft, low, "pleading" sound. It should start low, reach a high pitch and then abruptly cease. I start the call with the horn pointing down, about 3 feet (0.9 m) from the ground or water, gradually move it upward, and finish with a downward turn. Cows know when a bull is nearby; they moderate the volume of calling accordingly. I call three or four times in succession and generally to the four cardinal points of the compass. If no answer is heard, I try again in 8 to 15 minutes. I frequently hear cows calling, and time my calls to the intervals between theirs. Sometimes, cows will vocalize only once or twice and stop; other times, they call at precise intervals. I recall listening to a cow vocalize every 8 minutes from 7:30

A.M. until 10:30 A.M., when I left the area. On another occasion, I witnessed a cow at about 100 yards (91 m) call with a loud, drawn-out moan every 5 minutes for 3 hours. Frequent calling (every few minutes) is not natural and may discourage a wary bull. In addition, calling too loud in the initial two or three calls can have the same effect. If there is no response in the first hour, I attempt to get more distance on the calls by making it louder.

If a moose answers to a call, the hunter must be patient and try to ascertain the bull's location and intention. If the animal is close and apparently moving toward the point of call, it is advisable not to call again. At close range, bulls are increasingly critical of calls, and a wrong sound may spook him. Hunters are advised to carry three or four dried sticks. If a bull is reluctant to approach, a snap or two of the sticks, to imitate a cow moving, may serve to overcome his apprehension.

If the hunter is adjacent to water, splashing water or pushing the horn up and down in the water imitates the sound of a moose (cow) walking in water. Filling a horn with water and letting it run out the narrow end mimics the sound of a cow urinating.

If an approaching bull stops nearby and out of sight, and remains motionless, the hunter should call softly with the horn pointed down and away from the bull's location. This may deceive him into thinking the cow is moving off, and he may move in pursuit. When next to water, the hunter can make a grunting noise directly down at the water, which produces a slightly different sound and may entice the bull. The secret to successful calling is patience. Hunters should avoid the urge to change location. The better alternative is a different pattern (spacing) of calls. Some bulls will make considerable effort and time to get downwind of the call source, and may stay hidden for an hour or two before exposing themselves. Bulls accompanied by cows are extremely difficult to call.

On one occasion, a large bull responded to my call at about 9:00 A.M., but stopped behind a small bluff about 300 yards (274 m) away. I knew he was there because of the sound of antlers being rubbed on trees and an occasional grunt. After a while, all was quiet. When he had not appeared after an hour or so, at about 11:00 A.M., I decided to head back to camp, convinced that he was accompanied by a cow and not about to leave even to the challenge of another bull or a seductive cow. When I returned to the area about 3:00 P.M., the bull was in a meadow and, as anticipated, with a cow. Apparently, when the moose first approached as far as the bluff, and in the company of the cow, the cow likely bedded down and the bull was reluctant to leave her to investigate my calls.

That episode illustrated the point that, if no response is heard after about a half hour to an hour, chances are that a bull has lost interest. But the hunter should not assume that because one known bull has lost interest, there are no other bulls in the vicinity. On many occasions, I have had more than one bull respond to my cow calls.

The "blade" technique—rubbing a moose scapula against a tree—can be very effective in some situations. Ideally, the rubbing is against trembling aspen or dead trees from which the bark has fallen off. Live trees, such as birch or conifers, do not give the desired echo. The sound produced is that of a bull striking his antlers against a tree. If a bull answers but is reluctant to reveal himself, the blade can be raked against small shrubs.

I prefer not to use the blade initially because too loud a noise may scare off young (subdominant) bulls. Rather, I use it when a bull is present but will not reveal himself despite my vocalizations. I have experienced occasions when raking a blade has enticed reluctant bulls to come on the run. A horn, canoe paddle or moose antler also can be rubbed against low shrubs to produce the sound of a thrashing bull.

When a bull seems to have lost all interest in a closer approach, almost any trick can be tried to lure him into suitable range. At that point, the hunter has little to lose. I tend to rely, when all else has failed, on the low, plaintive, amorous call. Once, a bull responded to my call and first grunted at about 75 yards (69 m) distance. He heard but did not see me. After stalling, he proceeded to abandon his search for the cow I represented and moved off. With a low "seductive" call, I was able to stop him at about 200 yards (183 m) and turn his attention back toward my call. Within 5 minutes, he came to within 25 yards (23 m) of my position, grunting continuously as he approached and not being particularly cautious. This bull was 3.5 years old. Young bulls frequently vocalize more often than prime males. On occasion, the latter will enter an area quietly and only advertise their presence when quite close to the point of the call.

If calling at a site in the evening brings no results, the hunter ought to visit that location early the next morning, moving into position as quietly as possible and vocalizing like a bull. One or more bulls may have moved into the area during the night.

The tin can call can be effective but is somewhat "out of context" in a pristine setting. The can should be held up at about a 45-degree angle when the call is broadcast. It should be pointed downward and away and the call softened in answer to an oncoming bull. This technique is a bit more awkward than use of a birch bark horn, but it can be mastered with practice.

Bull calls are useful when paddling quietly along waterways, because moose frequently bed down in open areas in

the riparian zone. At "moosey" sites, a soft bull grunt may elicit response from a bedded animal that otherwise might not be detected.

Even when calling under ideal conditions, there will be no results. This suggests that a move to a different site is warranted. Another option is for a companion to call. The change of tone, pitch, volume, tempo and resonance may trigger a bull's interest. On one occasion I called a yearling bull to about 300 yards (274 m), but he would not come closer and eventually began to move away. My son asked for the horn, began calling in his own fashion and, within 10 minutes, the bull was within 20 (18 m) yards from us. This was my son's first calling experience.

The sounds moose make are difficult to describe, and are best learned from tapes, records and experienced callers. Video recordings of vocalizing bulls are especially useful for practicing calls.

During the rut, cows vocalize to advertise their presence and mating receptiveness to potential mates. In calm conditions, this call—the drawn-out moan—can be heard for several miles. If a bull responds, a cow will change from the moan to a plaintive or seductive call. I have heard seductive cows make myriad calls, all of which are difficult to describe or characterize adequately. Some are in response to overly amorous bulls when a cow is not receptive. Others are made to intimidate other cows trying to attract the same bull. An experienced hunter will recognize these calls as different from those of a female seeking a mate.

The cow call is imitated by moaning like a domestic cow, which is a good place to begin the learning process. The sound resembles a short *"mwar"* or a longer *"oo-oo-oo- aw."* The call emanates from the chest and is best accomplished by forcing the air up from the lungs and into the horn. Some callers suggest pinching the nose closed as the horn is blown, but this is not essential.

Some videos on calling bulls can make the art more complicated and confusing than it needs be. The best advice to a novice caller is to pick one or two cow calls and try to perfect them, and not worry whether the bull being called is a teenager, prime or postprime animal. Also, a cow call is the better call to attract bulls.

The bull call is more abrupt, lasting only about a second. It is best done by saying *"o-oh-Ah,"* with more emphasis or force at the end. It has been described as a grunt, burp or snort. Bulls repeat this grunt every few steps as they get closer, but it can be periodic. Older bulls have a lower voice, with a deeper pitch. Being more experienced, older bulls tend to answer less frequently as they approach. Younger bulls tend to be more vocal and have a higher pitch. A hunter with a deep voice has a chance to be an excellent caller.

The bottom line for successful calling is patience, alertness, practice and field experience.

Tracking

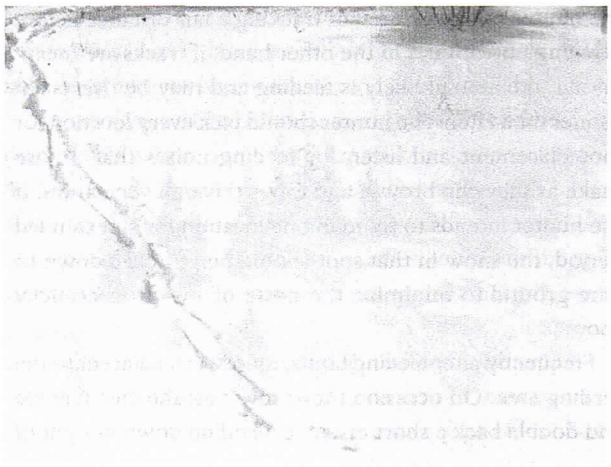
The most obvious moose sign in the bush is the track, which most hunters can recognize. Other signs also are important, and being able to read them will help improve the chances to harvest a moose. Those other signs include: fecal deposits—summer feces resemble an amorphous mass similar to those of domestic cows, whereas autumn and winter feces are oblong pellets; wallows or rutting pits in which bulls have urinated and rolled to coat themselves with the odiferous scent; and trees or small bushes beaten (thrashed) by a bull during the process of removing antler velvet or advertising his presence to other bulls and cows. Pieces of velvet on the bushes and fresh breakage of browsed trees and shrubs are indication of moose in the vicinity.

To track moose by their hoof prints, it is helpful to know whether the impressions were made by a bull, cow or calf, their freshness, what direction the animal(s) was going and how purposeful the movement (i.e., running, feeding, or milling). In most cases, direction usually is easy to detect—the tip of the long drag usually faces the direction the animal is going. Adult moose have larger tracks than calves do. Calf tracks generally are less than 3 inches (7.6 cm) in length, whereas cow tracks vary from 3.5 to 4.5 inches (8.9–11.4 cm) and those of bulls as much as 5.5 inches (14.0 cm) in width (Timmermann 1990). Cow tracks are more elongated and pointed than those of bulls, which are more rounded, especially those of rutting bulls. To ascertain track freshness, such clues as water (clear indicates old, cloudy indicates fresh) and vegetation (bent indicates fresh, upright indicates old) are helpful. Running moose usually leave indication of dew claws in the track.

Determining the gender of a trailed moose by its urine splash is not easy, contrary to widespread belief. Bull moose squat slightly to urinate and the urine is deflected about 25 degrees by the prepuce or penal opening, which faces toward the rear. Thus, the urine hits the ground near the center of an imaginary line drawn between the two rear hooves, similar to location of urine discharge of a cow. Nevertheless, urine in snow from bulls generally is more concentrated than the wider splash of cows. Some hunters are adept at picking up the subtle differences.

Fecal matter that is warm, moist and glassy is only minutes old. That which is cold, dry and not shiny is at least a few hours old.

Tracking moose in snow is a challenge, and even more so during the snow-free periods. When tracking, it pays to go



There are many signs in the bush that can indicate the presence of moose to an observant hunter. The most obvious is tracks (top left). The tip of the long drag indicates the animal's direction of travel. Scat also is convincing sign, and a hunter can learn to read the freshness of fecal deposits. In summer and early autumn, they may be an amorphous mass, similar to that of domestic cows. Later in autumn and winter, they are oblong pellets. Wallows or rutting pits (center left) are associated with bulls in the rut. Bark and leaves removed from trees or small bushes (bottom left) is evidence of thrashing by bulls to shed antler velvet. Pieces of moose antler velvet found on the bushes (top right) indicate fairly recent activity by a bull, as scavengers usually are quick to find and make off with it. Breakage of small trees indicates moose browsing activity (bottom right), and the freshness can be determined by examining the break for moisture or dryness. *Top left photo by Vince Crichton. Top and bottom right photos by Charles C. Schwartz; courtesy of the Alaska Department of Fish and Game. Center and bottom left photos by Albert W. Franzmann; courtesy of the Alaska Department of Fish and Game, Soldotna.*

slowly and quietly and be alert for sign. The hunter should make every attempt to stay downwind of the moose (Figure 230). This may require following away from the track. In such cases, the hunter should move back toward the track every couple of hundred yards to reorient to the animal's direction. This technique often is used when hunting in snow as the track is much easier to locate. It is a traditional ploy and further described in Chapter 1.

Again, the key to a moose's survival is its sight and smell, and both senses are acutely developed. I have observed moose walk downwind with a moderate breeze blowing human scent toward it and the animal has not bolted but continued on its way. Either the winds were blowing the scent above the animal or it simply chose to ignore the odor. I believe that the former was true. Swirling winds, common in the boreal region, have cost many a hunter—including me—many a shooting opportunity after a long and otherwise successful stalk.

Wet conditions are best for tracking during snow-free periods because they allow the hunter to move relatively quietly, and hoof impressions are fairly easy to see in leaves and soil.

For all tracking circumstances, the hunter should stop frequently to look and listen. A continual pace is unnatural and more noticeable. A good stalking technique, if it can be mastered, is to place the front part of the foot down first followed by the heel. It minimizes crunching underfoot. If a moose appears to be running or following a straight course, the hunter can be assured of tracking a fair distance before catching up with it. On the other hand, if tracks are meandering, the animal likely is feeding and may be overtaken sooner than later. The hunter should pick every location for foot placement and listen for feeding noises that moose make as they clip browse and move through vegetation. If the hunter intends to stand in one location for an extended period, the snow in that spot should be removed down to bare ground to minimize the noise of boots on crunchy snow.

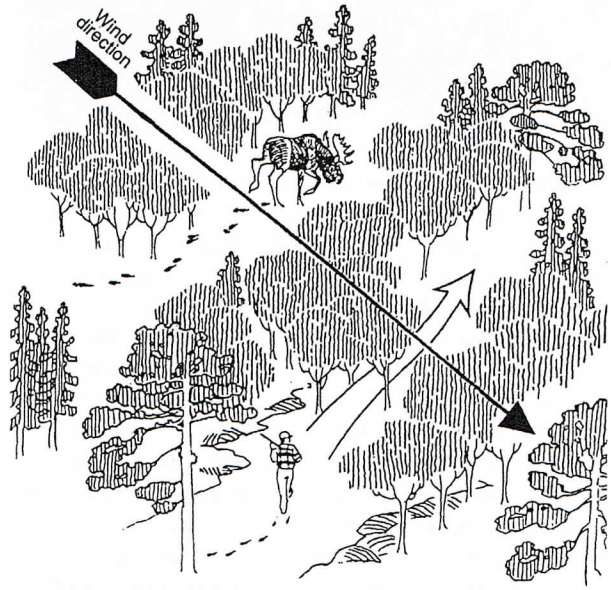


Figure 230. When tracking moose in snow, the hunter should move on the downwind side of the track, and periodically move to the track to make certain of the animal's direction of travel (from Monk and Buss 1990).

Frequently after feeding bouts, moose rest adjacent to the feeding area. On occasion they move past the feeding area and double back a short distance, bedding down in sight of the trail they just came along. Some refer to this as the "buttonhook" maneuver (Figure 231; see also Chapter 1). Some hunters suggest that moose usually turn to the left when they backtrack, but this tendency has never been proven.

If spooked, a moose may move a short distance and slow down, or it may move a considerable distance. Pursuit may be possible, but usually the hunter is best advised to search for a different animal that has not been alerted. Hunters who do follow a startled moose often tend to proceed too quickly and almost inevitably spook the animal again. Time of day and familiarity with the area also dictate whether to follow. Instead of following tracks late in the day, hunters should leave the track and get an early start the following morning.

In soft snow, tracking sounds are muffled, to the hunter's advantage. Hunters who locate a moose after tracking through crusted snow are simply lucky. Moose that have not been disturbed can be found by following 1- or 2-day-old tracks. Once on a track, a hunter should note by compass its direction, and subsequently recheck the compass course frequently. Tracks in snow can be checked with the hand. Fresh tracks, although packed on the bottom, will not be frozen there or on the sides. In cold, frosty weather, the track will freeze within a few hours, but this is not the case in milder conditions. The track can be checked for the presence of fresh fallen snow or for ice crystals.

Days with a moderate wind are best for tracking. If two hunters are involved, one may choose to follow the track, while the other stays downwind and slightly ahead. Windy weather will muffle many of the sounds a hunter makes, but as windy conditions increase, so does the moose's alertness. Shallow, fresh snow on a day with a continuous wind is ideal for tracking.

A tracker frequently will observe moose "beds." A large bed with one or two smaller ones signifies a cow/calf group, whereas larger beds are made by adults. During the rut, large beds together may be from a bull and a cow. In

Figure 231. If undisturbed, moose often rest after feeding. They commonly circle back on their track and bed down where they can view their back trail. This is called a "buttonhook" maneuver (from Monk and Buss 1990).

snow, antler prints made by sleeping bulls resting their antlers on the ground may be visible.

Antlers of mature bulls will reflect light, much like a mirror flash in sunlight. In addition, hunters should be cautious to differentiate yearling bulls from cows, because the formers' small antlers blend in with the ears and are difficult to see.

Bulls tend to run through branches, but cows and calves normally duck underneath obstacles. All moose normally walk around obstacles. If a moose goes straight through heavy bush, the hunter likely has been detected and the animal spooked. Cows with calves are more difficult to track than bulls, because they are especially alert to danger that may imperil their calves. Also, lone moose usually are more alert than groups. In the latter case, a loosely associated group may attribute noises a hunter makes to one of their own kind.

Moose are extremely adept at differentiating "moosey" sounds from human sounds. Hunters should avoid carrying coins, keys or other metallic, noisy things, including ammunition, in pockets, or wrap them in a handkerchief or paper towel. Also, hunters should not wear clothing that smells of camp odors. This can be overcome if the hunter changes to outer clothing in camp, keeping the hunting apparel in an airtight bag. The compass and a pocketknife should be kept in separate pockets.

Shot Placement

A well-placed shot will ensure that the animal drops immediately or within a short distance.

Although there are a number of vital shot-placement areas, preference should be for the heart/lung area (Figures 232 and 233). The brain and spinal cord also are vital areas, but shots aimed there must be especially precise. Shots at moose in questionable circumstances, such as long distance, running, behind obstructions or at bad angles, must not be taken.

Once a moose is down, the hunter should move to the animal immediately and, if it is still alive, administer a final shot in the neck region just behind the skull. Head shots are not recommended, because the skull plate to which antlers are attached may be broken, resulting in unscoreable antlers.

The reaction of a moose to being shot and its behavior afterward often are clues to where it is hit. With a heart shot, for example, the animal may go down immediately or bolt forward for a short distance and then collapse as blood drains from the heart into the thoracic cavity. With a lung shot, the moose may walk off apparently unaffected. Within 50 yards (46 m) or so, it generally will stand or lie down, often coughing or wheezing, with blood running from the nose. With most spinal shots, the animal will drop immediately. In some cases, especially if the spine is broken, the moose will die immediately. If the spine is not broken, the animal may be paralyzed, necessitating a final shot. In yet other instances, the shot may produce spinal shock rather than spinal damage, and this warrants hunter cau-

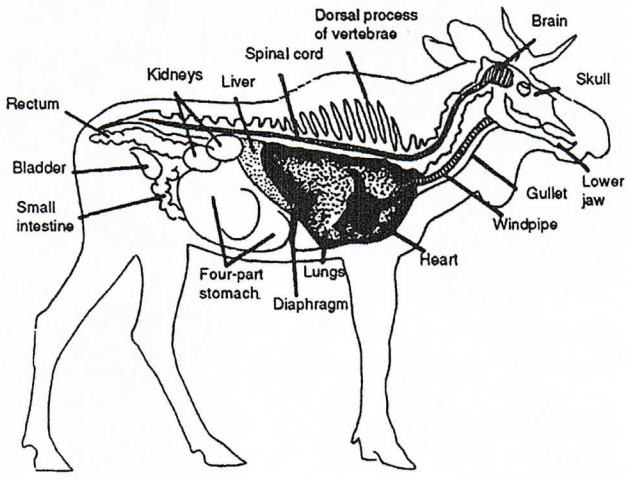


Figure 232. Internal organs of a moose. The best shot placement is in the heart/lung area. *Illustration by A.B. Bubenik.*

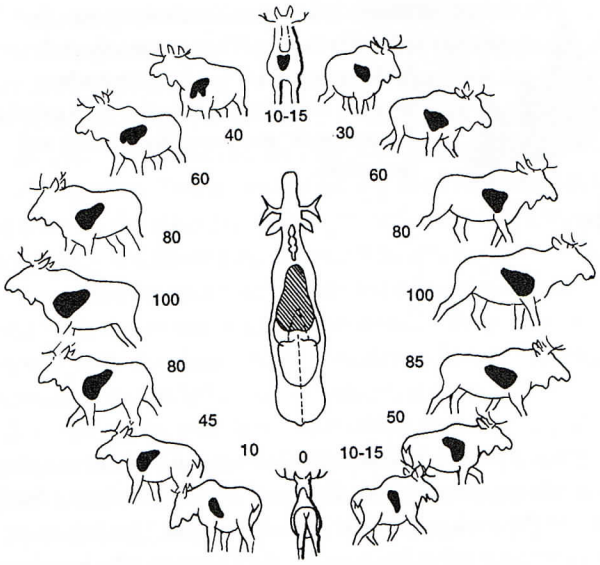


Figure 233. Proportion and percentage of the vital heart/lung area of a moose from different angles. A quick, humane kill from a well-placed shot should be every hunter's goal. Shots should not be taken at a moose that is not clearly visible or in a stance or posture that prevents proper shot placement. *Illustration produced by the Swedish Sportsmen's Association.*

tion. The animal may only be stunned, and may rise up suddenly and bolt as the hunter approaches. I have experienced this, but fortunately was in a position to make a final killing shot. With a liver shot, the animal often hunches up, moves off slowly and beds down within 500 yards (457 m) if not pursued immediately. With a stomach shot, a moose likely will run off as if unaffected, but it, too, likely will lie down within 500 yards (457 m) or so if not immediately pursued.

A quick, humane kill resulting from a well-placed shot maximizes edible meat. Meat from animals that were stressed for a prolonged period by running or wounding may taste gamey or be tough from a build-up of lactic acid in the muscles, which inhibits fiber breakdown during the aging process.

Tracking Wounded Moose

If shot placement is not perfect, the hunter likely will have to track the moose. Flagging tape to mark the animal's escape path is invaluable, and especially so during snow-free periods.

Once a wounded animal is out of sight, the hunter should not rush to get on the track. Staying still and listen-

Unless a legal moose is well within range, fairly stationary and clearly visible, shots should not be taken. A misplaced, hurried or deflected shot almost invariably is worse than no shot at all. One of the best characteristics of a moose hunter is patience. *Photo by Vince Crichton.*

ing to what the moose is doing and where it is going are important procedures. They give the hunter opportunity to orient the follow-up, get collected from the excitement of the shot and avoid pressing the animal into unnecessarily farther flight. If the moose is heard going down or perhaps "wheezing," indicating a well-placed shot, the hunter should wait at least half an hour before approaching the area cautiously. If the hunter is reasonably certain of a hit in a vital area, but the moose has left his view, he should remain in place for at least an hour before looking for the animal. If the hunter is not quite certain that the shot hit a vital area or knows the moose was "gut shot" (hit in the abdominal cavity), a wait of 2 hours before search is recommended. The only reason not to wait before tracking is if rain, snow or impending darkness may eliminate or obscure sign.

Once a search begins, the hunter should mark his shooting location with flagging tape, then move to the location where the animal was when hit and mark that site preferably in a manner that will enable it to be located from a distance. This assists in determining the precise direction the moose went. At the "hit" site, blood, hair, stomach contents, bone or other tissue may indicate where and how seriously the moose was shot. *The absence of sign at the hit site does not necessarily indicate that the animal was not hit.* If sign is not immediately found or in the absence of a clear blood trail, the hunter should walk a progressively increasing spiral course outward from the hit site in the direction the moose was last seen, until sign is found.

If possible, a companion should be enlisted to help with tracking. That person should be fully advised of the shooting circumstances and the animal's subsequent behavior and movement. This information and a plan of search should be conveyed before tracking gets underway, so the search is coordinated and without conversation. Communication should be by hand signals. Ideally, one person will stay on the sign trail and the other will be off 30 to 50 yards (27–48 m) to the downwind side. The person on the trail should move forward about 50 yards, while the other person waits and remains alert to sound or sight of the animal. Then the other person moves up, parallel to the tracker, while the tracker alertly waits. The procedure continues until the animal is located.

Well-hit animals bleed internally and usually expel blood through the wound especially when running. On some shots, particularly high ones, skin closes over the wound, preventing much blood loss. Arterial blood from the heart and lung area is bright red. Blood from a lung shot usually is frothy and pinkish. Blood from the abdominal cavity is dark red; if the stomach was hit, blood invariably contains small pieces of food. Trackers may not see blood on vegetation until it is brushed onto clothing.

A wounded moose that walks around obstacles may not be as hard hit as the one that stumbles or does not avoid the thick brush. My experience is that wounded moose tend to travel into the wind. If, in the course of tracking, the wounded moose is "started up," but cannot be dispatched, the tracker(s) should again wait half an hour at least before renewing the pursuit.

Every moose hunter has a legal and ethical obligation to make every reasonable effort to recover wounded animals. Management jurisdictions anticipate that some animals are wounded and lost, but this does not justify in any way less than a fully concerted effort to find moose that are wounded. The objective must be a zero loss.

After the Kill

Proper care and handling of moose meat is an essential aspect of the hunt. The hunter has the responsibility to utilize harvested moose as fully as possible. All jurisdictions have wanton waste statutes. In any case, any person who is unable or unwilling to process a moose fully should not get a license or exercise the hunting privilege.

Some basic knowledge is needed to process a moose carcass in the field, transport the meat and other desired parts, and prepare them for use or storage. On numerous occasions, I have heard hunters complain of bad moose meat. When I had opportunity to examine the meat and/or question those individuals, invariably I learned that meat was improperly dressed, cut, cleaned, transported, aged, packaged, frozen or cooked. Rarely has "bad meat" come from a "bad moose."

All jurisdictions require that a license or tag be notched and/or attached to the carcass once a hunter takes possession of the animal he killed. This is the hunter's first and foremost task when the animal is found dead.

Bleeding a moose by severing the jugular vein generally is unnecessary, because modern ammunition causes enough damage to drain most blood into the abdominal or thoracic cavity.

Field Dressing

Dressing a moose is possible with one person, but additional help is preferable and highly recommended. If a moose ends up in water, a block and tackle should be used to bring it to shore.

Preferably atop a lightweight plastic tarpaulin that can serve as a "work table," the moose carcass should be positioned on its back or right side because the rumen or paunch is on the left side. This facilitates relatively easy removal of the entrails. If the animal can be placed on an in-

cline (head higher) the visceral organs will slide toward the back and further assist in dressing. Keeping the carcass on its back is difficult, but by attaching rope to the middle portion of the right front and rear legs and then to adjacent trees strong enough to support the carcass, that position can be stabilized. In the case of bulls, the head can be positioned upright, with the antler tines embedded into the ground.

If the hunter intends to have the animal's head mounted, this decision must be made before skinning, because special cutting instructions are involved. These are discussed later in the chapter.

Before skinning, the hunter may wish to remove the tarsal glands located inside of the back legs near the hocks. Some hunters suggest that secretions of these glands, if transferred to meat, can produce strong odors. However, I have never found the tarsal glands to be overly active organs, even on bulls taken during the rut, so I seldom remove them. In any case, the tarsal gland odors are not as strong as those of a white-tailed deer.

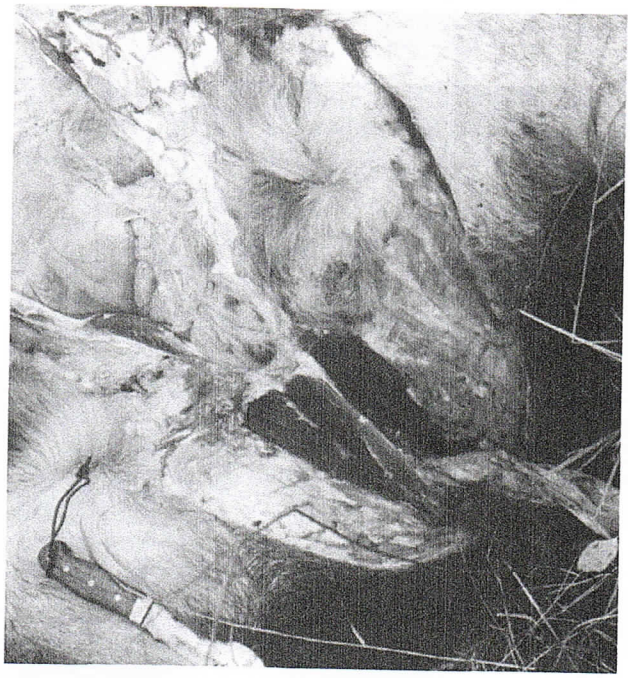
I prefer to begin the skinning process in the brisket area. The initial cut should go forward to the upper neck area and then back to the anus, passing on either side of the penis and scrotum in bulls or the vulva in females. The next cuts are around the anus (and vulva in the case of females) and large intestine to free those parts from the surrounding tissues and bone. A string tied around the anus prevents deposition of fecal material in the body cavity when it is later pulled through the pelvis. Incisions then are made from the central cut line along each leg toward the hoof. Care must be exercised to keep hair off the meat. I recommend that once the skin has been incised to start the skinning process, all cuts (sliding the cutting blade under the skin and cutting up through the skin) should be made so as not to cut hair shafts. I prefer to skin one side entirely to the middle of the back, and then the other side. This requires rolling the carcass to access the back area and other side. Once the hide is loosened totally, it can be stretched out, hair down, and used as a "table" to continue with the dressing. Then, removal of the entrails begins.

With the animal on its back, a small incision should be made into the abdominal cavity at the posterior end of the

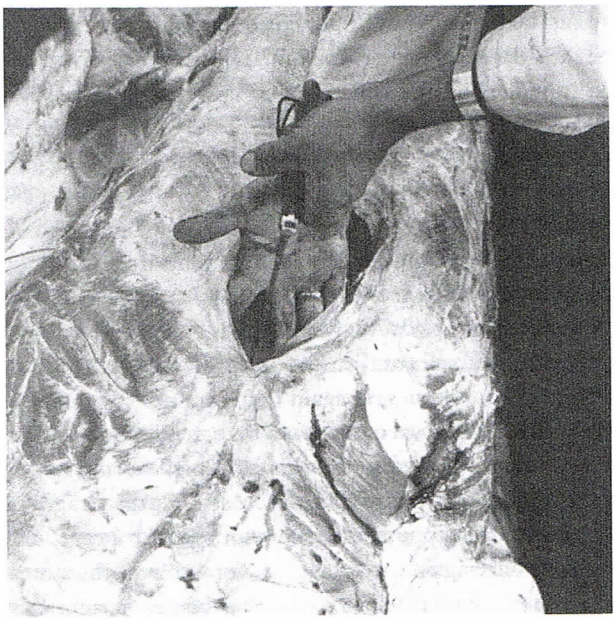
The task in field dressing a moose is to position and stabilize the carcass for efficient skinning, cutting and gutting. The carcass above is kept on its back by means of a rope secured around the left legs and anchored by a nearby tree. Note the proper cut lines for skinning, *except* in the case of a cape mount (see Figure 236). Similarly, and regardless of whether a moose carcass is skinned in the field or quartered with hide left on, gutting is accomplished by a shallow incision along the underside center line, from at least the base of the sternum to the anus. In all instances, the gutting incision is after the skin has been split (mostly from beneath) and pulled back from the center line to minimize cutting or loosening hair. *Photo by Vince Crichton.*

Some hunters prefer to remove the tarsal glands from the rear limb of a moose carcass to ensure that meat is not contaminated by residue of gland secretions. *Photo by Scott Crichton.*

brisket, taking care not to puncture the stomach. Two fingers are placed in the incision and, with pressure down on the stomach and the knife pointed upward, an incision is made to the anal area. Then, back at the starting point, a cut is made to the base of the neck, freeing the esophagus and trachea (windpipe). A length of strong string, about 36 inches (91 cm) long, is tied tightly around the upper end of these structures to prevent stomach contents from escaping and contaminating the meat. The string then can be used to pull the entrails backward, facilitating removal of the digestive tract. The sternum can be severed with an axe, but preferably cut with a saw, again with care not to puncture the stomach. Removal of ribs from the sternum on one side may be accomplished with a knife. Whichever option is used, the thoracic cavity will be exposed. The diaphragm is then cut from its point of attachment to the rib cage and sternum, once again carefully so as not to pierce the stomach. The string attached to the trachea and esophagus can be pulled backward on the entrails for removal with little additional cutting. Care must be taken when cutting along the backbone to ensure that the tenderloins are not cut. The colon (posterior part of the large intestine) and anus (and vulva in females), which earlier were cut free, can then be pulled through the pelvis. The entire digestive tract, along with heart and lungs, are then pulled off to the side.



Preliminary to opening the body cavity of a moose carcass, cuts are made around the anus (and vulva of cow moose) to free it and the attached large intestine from surrounding tissue and bone (left). A string tied around the anus will prevent fecal deposition into the body cavity before the detached organs can be severed and pulled from the pelvis. Hide in the anal area then is skinned back, the penis and scrotum pulled to the posterior and cuts made into the muscle to the pelvic girdle (right). The girdle then can be sawed or carefully chopped through. *Photos by Vince Crichton.*



For the abdominal incision in a moose carcass, the field dresser's fingers or part of the hand should be placed through the initial cut and followed behind the inside-out incision (like most skinning cuts), to prevent accidental cutting of the rumen or paunch. The moose paunch may be very distended with both food material and gas depending on the feeding pattern of the animal before shooting. However, during peak of the rut, bull moose eat little or nothing. *Photo by Vince Crichton.*

Edible organs can be removed. The heart and liver, if saved for food, should be drained of blood and set in a clean, cool place.

If the hide is kept on to keep the quarters clean while being dragged or otherwise moved, care must be taken to keep exposed flesh clean. In any case, the hide must be removed within a few hours to facilitate cooling.

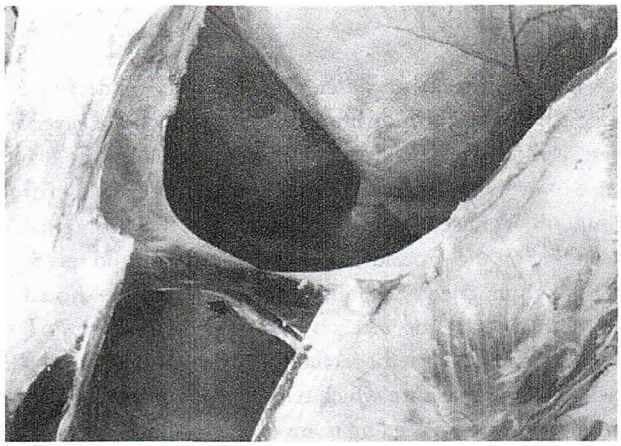
Quartering

Cutting a carcass into four or more pieces facilitates handling. A moose carcass, even quartered, is equivalent at least to half a dozen deer or several elk and presents a formidable task to move it.

Moose carcasses usually are quartered after skinning. But, when quartering is done with the hide on, care is needed to keep hair off of meat.

The first step in quartering is to locate the fourth and third last ribs and cut the muscles between them on both sides up to the backbone. Then, the backbone is cut through with a saw. Next, the back half is sawed into two pieces along the middle of the back (an axe does a messy job and results in bone splinters). If done properly, the spinal column should be visible along your cut. Leaving the lower leg on up to this point makes it easier to handle, but it now can be removed with a saw just below the hock area

A rope attached tightly to the esophagus and trachea (left) prevents expulsion of stomach contents of a moose carcass before removal of internal organs. For removal of those organs (right), the connected rope then provides force and leverage. *Photos by Vince Crichton.*



The diaphragm (arrows) of a moose is freed by cutting it along its attachment to the rib cage. *Photo by Vince Crichton.*

(leaving the Achilles tendon intact to facilitate hanging). The front half can be cut into two pieces in a similar manner, but first the head is removed in the upper neck region. By cutting slightly to one side of the backbone, the job of splitting the front half will be much easier. The most difficult part of the entire dressing procedure is cutting the front and rear halves into quarters. This is a job for two or more people. A small chain saw, with cooking oil to lubricate the chain, makes quartering the carcass relatively fast and easy.

Additional cuts can be made to lighten the load by removing the front legs from the rib cage. To do this, the muscles holding the leg and shoulder blade in place need to be cut. Cutting an animal into more than the four quarters will make transportation easier, especially if they have to be carried. Heavy loads in typical moose country can be hazardous and exhausting. Better to make an extra trip than to risk injury.

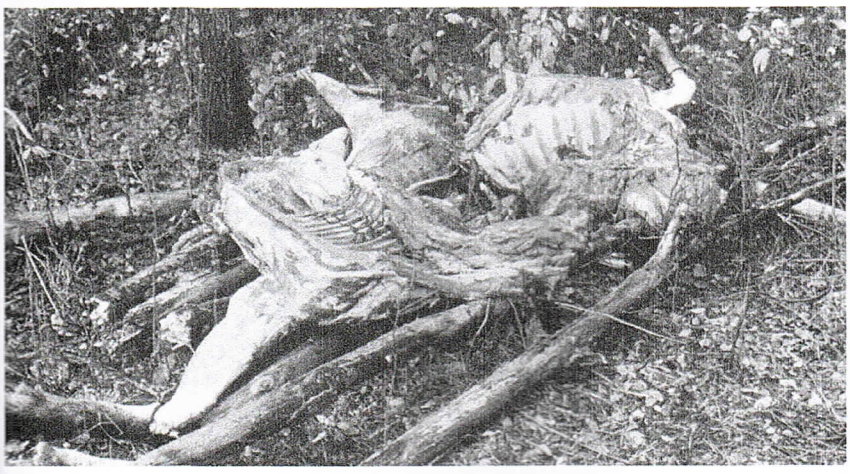
Deboning meat is a laborious job in the field, and proper equipment is needed to carry this meat out of the bush. I recommend quartering.

Use of a bone saw to divide a moose carcass down the spinal column (backbone) saves time and meat. Trying to field dress and quarter a moose carcass without the proper equipment is a wasteful exercise in futility. The correct, sharp blades for cutting also will make the eventual processing of meat much easier. *Photo by Vince Crichton.*

Hunters should be certain to collect the biological specimens requested or required by management authorities, and submit them where designated as soon as possible.

Cooling

Once quartered, the meat or quarters should be elevated on clean logs where blood can congeal and cool air is able



Cutting a moose carcass into four or more pieces eases handling. The front quarters, which are the heaviest, can be lightened by removal of the foreleg and shoulders from the rib cage. *Photo by Vince Crichton.*

to circulate around the meat. Congealing takes about 30 minutes, about the time necessary to pack up the field-dressing equipment. Thereafter, the quarters should be wrapped in game bags or cheese cloth to keep them clean.

If, for some reason, the eviscerated carcass must be left unattended until the next day, cooling can be facilitated by propping the sternum open with a stick placed on each side of the cut. Also, the hide along the inside of the legs should be cut to permit body heat to escape from the heavy leg muscles. Blood can be wiped off the meat or drained from the body cavity, but under no circumstances should water be splashed on the carcass to wash it. Water accumulates in the small tissue pockets and produces an ideal medium for bacterial growth, eventually resulting in spoiled meat. Stomach contents that may have spilled on the meat should be removed with a damp cloth. Fresh meat must never be wrapped in plastic.

Also, the gut pile should be pulled away from the immediate area of the carcass and an article of clothing "flagged" over or next to it to discourage scavenging. If possible, the carcass can be covered with brush and exposed muscle bundles covered with pepper to keep off flies.

Meat can spoil from improper cooling even in cold conditions. I once shot a moose near dark in an open bog. After dressing the carcass and forced by darkness to leave it until the next morning, I turned the carcass over and "spread-eagled" it on the snow to prevent ravens from getting at the meat. Despite freezing temperatures that night, heat was unable to escape from the hump region and about 10 pounds (4.5 kg) of meat spoiled.

Properly dressing and cooling an animal will prevent meat from tainting, which is caused by bacteria that multiply and spread. These bacteria may be present in the moose before death and develop in the absence of oxygenated blood, or they can be picked up from the ground, air or hands contaminated during field dressing.

Transportation

For transporting a moose carcass, quarters or deboned meat to a base camp or home, three cautions are given. First, a moose carcass should not be dragged a long distance or over rough terrain without putting it on a sleigh or some other raised platform. Otherwise, the continual pounding on the ground causes heavy bruising and severe damage to the meat. Second, two moose carcasses should not be placed on top of each other. This again prevents proper cooling. A useful technique is to put poles in the back of the vehicle onto which two quarters are placed. Additional poles are placed on these quarters and the remaining two quarters placed on top of them. In this manner, air can circulate around the meat (Figure 234). And third, an unskinned animal should never be left in the back of a vehicle overnight. This, too, is an invitation for spoilage due to improper cooling.

Hanging

When the meat is back at camp or home and hung, the cheesecloth is removed and the meat cleaned as best as possible by wiping with a moist clean cloth. Areas damaged by the bullet plus hair, grass, dirt and leaves should be removed (some butchers charge extra for cutting dirty meat; others will refuse it). The cheesecloth then is replaced or the meat put in other bags that do not retard air circulation. I then place a loose-fitting fly-proof sock around the meat and close it off with Velcro™. If the meat is in a sunny area, a tarpaulin should be stretched over the meat pole for shade but not in a manner that inhibits free air movement. Plastic can be placed on top of the tarpaulin to protect the meat from moisture.

Flies can be a nemesis, and every precaution must be taken before the hunt to ensure that the problem can be dealt with

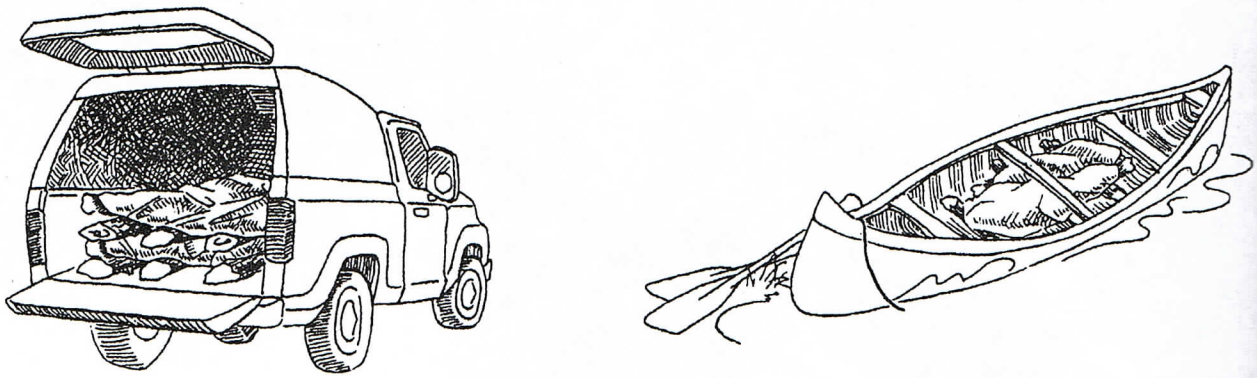
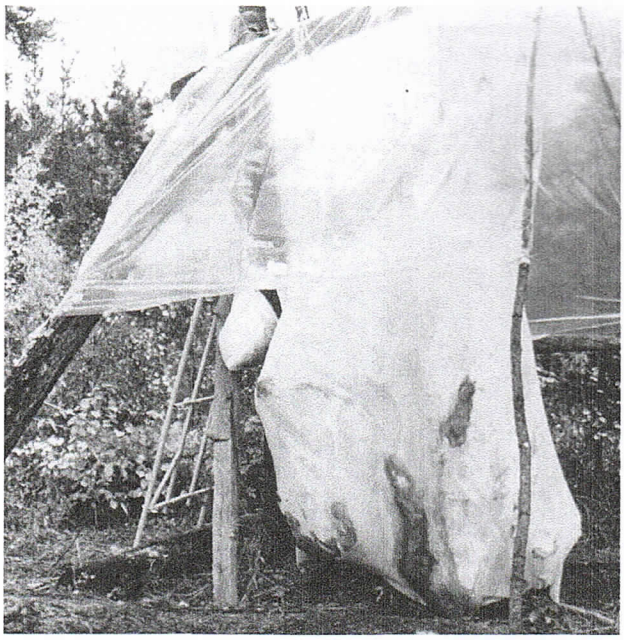


Figure 234. For transporting moose meat, every precaution should be taken to keep the meat clean and to ensure air circulation around all parts (from Monk and Buss 1990).



Plastic should only be used to keep rain off of moose and other game meat. Fresh meat should never be wrapped in plastic, which does not allow air circulation for essential, proper cooling. *Photo by Vince Crichton.*

if the weather is warm. If the meat is not protected, flies lay eggs on cut surfaces and in blood vessels. Hunters should never assume that flies will not be a problem.

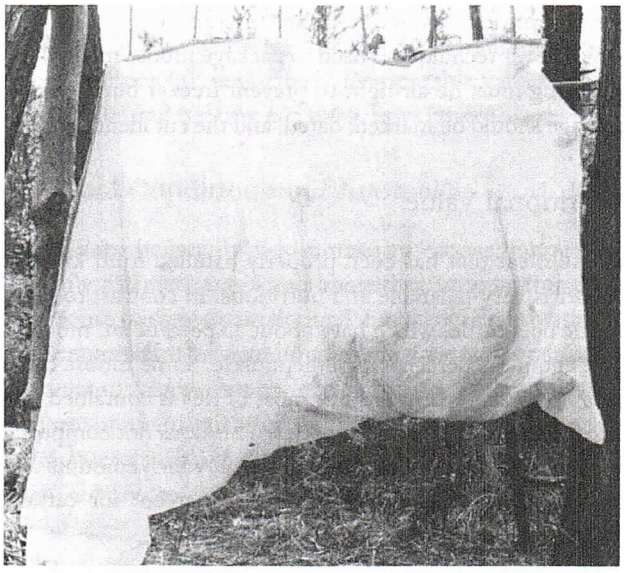
Grizzly bears and/or black bears live throughout North America's moose range. They are readily drawn to gut piles and may be attracted to camps where moose meat is stored. Accordingly, if a carcass is left overnight before it can be moved to camp, returning hunters should approach the area noisily, alert and well-armed. Bears "on a gut pile" (after scavenging, they often cover the remainder with brush and dirt, before resting nearby) can be defensive of their "cache." Moose meat at camp should be hung or otherwise stored at least 40 to 50 yards (37–46 m) distant, but visible from camp.

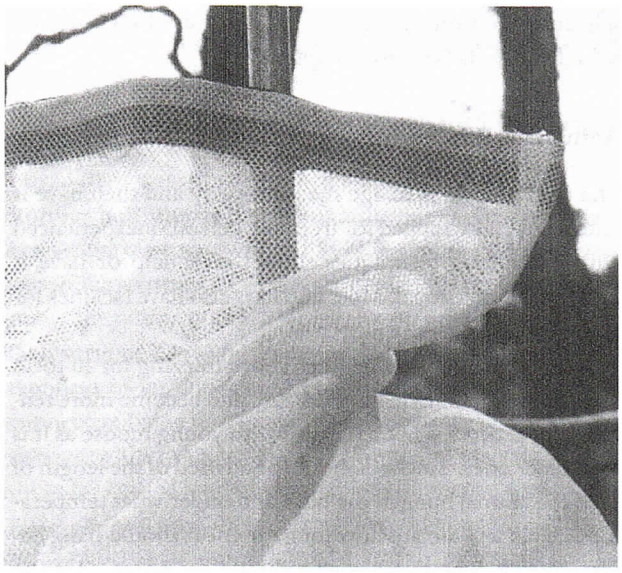
As indicated, moose meat can spoil if improperly cooled. It can also be less tasty if cooled too quickly or allowed to freeze immediately after the animal is killed. For those hunting during freezing weather and camping in the bush for several days, the carcass should be skinned and the quarters placed on clean snow. The quarters then are covered with the hide, which itself is covered totally with a thick layer of snow. The meat will cool but not freeze under most circumstances until it can be taken to a suitable hanging facility.

Once a carcass has properly cooled, it can be hung for several days (up to a week), provided that the air temperature does not go above 45°F (7.2°C). At higher temperatures, the meat needs to be refrigerated.

The Hide

Moose hide can be used to make a variety of clothing such as mitts, vests, moccasins, slippers and jackets. With this in mind, consideration should be given before the hunt to taking salt to place on the raw hide (which, from large bulls, can weigh as much as 100 pounds [45.4 kg]), thus preventing spoilage. If salt is not available, all excess flesh and fat should be removed and the hide placed over shrubbery for drying. It should not be placed in plastic bags. If the hunter





To cover moose meat or quarters hung near camp, fly-proof netting can be sewn as a shroud (left) and made to fasten at the top with Velcro (right). *Photos by Vince Crichton.*

Ontario hunters are encouraged to contribute their moose hides to First Nations people who produce smoke-tanned hides or manufacture leather goods, such as mittens and slippers, from commercially tanned hides that they purchase. In turn, the hunters receive blaze-orange caps, which feature a different emblem each year. In recent years, First Nation peoples have assumed the responsibility for collection and distribution of donated hides. Although not part of that cottage industry, moose antlers are valued by artists that carve them into a variety of forms and scenes. They also are used to make buttons, picture frames, furniture, lamps, etc. *Photo by H.R. Timmermann.*

is not intent on making use of the hide, consideration should be given to donating it to someone who will. The cost of commercial tanning in 1996 will be about $10.00 per square foot ($100/m^2) Canadian for hair-on hide and $95.00 Canadian for a dehaired hide. In many jurisdictions, there are organizations who collect the hides (and antlers) and sell them, and the funds generated are used for assorted wildlife projects (see also Chapter 17).

Aging and Butchering

The final process is to age meat properly and then have it butchered and wrapped for freezing. Persons inexperienced with butchering techniques should seek help or have it done by a professional. Most butchers also have facilities for hanging and aging the meat.

Aging meat at a few degrees above freezing for 10 to 14 days allows the muscle fibers to cure and become more tender. This process is not as critical with young moose as it is with older ones. Butchers should be advised of the length of time the animal hung in the bush and under what temperatures. This will dictate how long the meat should hang before cutting. The butcher also should be informed if the meat got wet, which will alert him to cut and freeze the meat before spoilage occurs.

Most moose meat is butchered similar to beef, with many muscle bundles cut into a single piece. An alternative to this, although more time consuming, is to separate the larger muscles by groupings on the carcass and make meal-sized portions. The advantages are that the meat is not as likely to accumulate freezer burn and the unique flavor of different muscles is not diminished (Figure 235).

Whatever technique is used to package moose meat, the wrapping must be air-tight to prevent freezer burn. Each package should be marked, dated, and the cut identified.

Nutritional Value

Moose meat that has been properly handled from kill to freezer is very palatable and nutritious. In contrast to domestic beef cattle, which have about 30 percent fat, moose have about 1.1 percent fat in the muscle. Some moose can have up to 20 percent fat, but most of this is contained in the omentum and on the muscles. This does not compromise the protein content of moose meat, which amounts to 25 percent, compared with about 26 percent for cattle (Rowland 1989).

Lean roast beef has about eight times more saturated fat than does an equivalent amount of moose meat. Saturated fats result in the human body making more cholesterol.

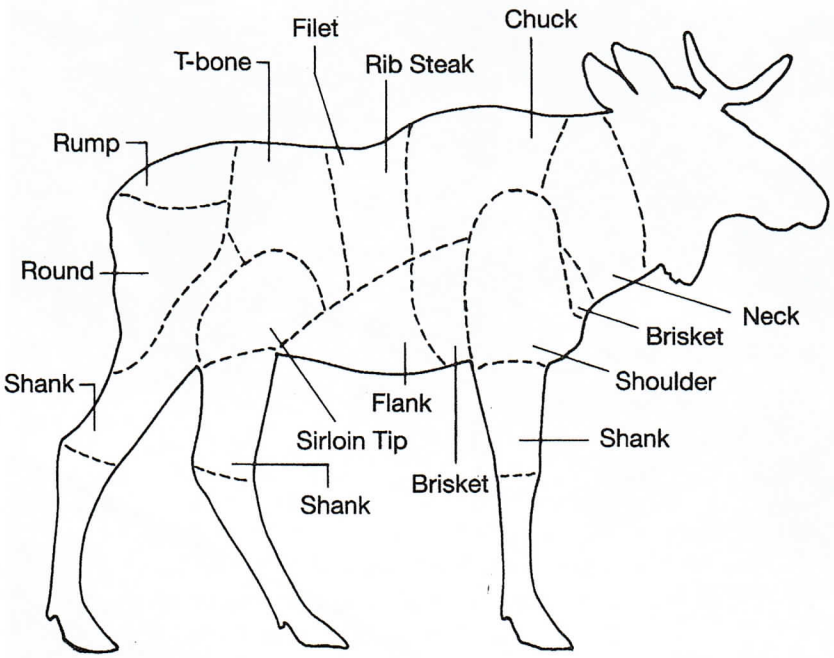


Figure 235. Primary meat cuts from a moose carcass. Roasts, steaks or both can be secured from the round, sirloin and chuck. Rib meat generally is converted to mooseburger, and shank and neck meat usually becomes mooseburger or stew meat.

Substituting moose meat for beef in the human diet can lower cholesterol levels, assuming other high-level cholesterol foods are not added.

Wild game contains relatively high levels of eicosapentaenoic acid (epa). This protective fatty acid, not found in domestic animals, improves the flow characteristics of blood. It equates to a natural antifreeze to ensure the fluids and organs of well-nourished wild animals do not stiffen in even the most frigid weather. Among others, Rowland (1989) suggested that epa in the human diet can protect against heart attack, atherosclerosis (hardening of the arteries) and certain forms of arthritis.

Moose meat also is an excellent source of calcium, vitamins B-1 and B-2, at levels 16, 0.02 and 0.37 milligrams (mg) per 100 grams (g), respectively. Comparable values in beef are 11, 0.07 and 0.19 mg per 100 g, respectively.

Unusual Conditions and Anomalies

During the process of field dressing a moose, hunters invariably will discover various anomalies, ranging from broken bones to disease conditions. The intent of this section is to alert hunters to them although the presence of parasites, diseases or broken bones, while perhaps aesthetically unpleasant, rarely makes the meat inedible. It may be necessary, however, to discard portions of meat immediately around an affected area. For further discussion of parasites and diseases with which hunters should be familiar, see Chapter 15.

Of particular importance is the fact that moose lungs, liver and muscle should *not* be fed to dogs unless those parts are well cooked, because parasite larvae may develop into adult tapeworms in pets.

Broken Bones

On occasion, moose limbs are broken and healed, leaving a large hard lump around the broken bone as a result of ossification. If the break makes the limb unusable, the associated muscles become atrophied. This meat is still edible. The lump itself and any abnormal-looking tissue in the vicinity should be trimmed away.

Rib bones frequently are found broken but healed over. Such injuries can occur from fighting or falls. This is particularly true for bulls, because they pull calcium from rib bones during antlerogenesis (see Chapter 2).

Fat Deposits

Rutting bull moose stop eating during the rut and have been reported to go without food for up to 3 weeks at this time (Schwartz et al. 1985, Miquelle 1991). During this time, they lose up to 20 percent of their body weight (Schwartz et al. 1987a); most of this loss is due to the metabolism of fat deposits. Adipose tissue (fat) is a form of connective tissue that forms when body cells take up fat for storage within the cytoplasm. The tissue associated with these fat cells is known as "areolar connective tissue" and provides both cushion and flexibility as needed. Within the subcutaneous tissues, a layer of loosely arranged areolar connective tissue fibers attaches the skin to the adjacent muscles (Frandson 1965). Moose store large quantities of fat

High-quality meat is a primary motivation for some moose hunters, but for most other moose hunters, meat is one of many desirable by-products of the hunting experience. The value of moose meat—which is high in protein, calcium and iron, and low in fat content compared with beef, pork and most other domestic meats—can easily offset the cost of most hunting trips. For example, at a conservative value of $4 per pound ($8.81/kg), an average yield of 352 pounds (160 kg) of edible meat from a single moose (Hamilton 1981) represents at least $1,408. For moose meat to have maximum value, it must be properly prepared and frozen, and consumed within a reasonable period of time. Before packaging, meat should be cleaned of all hair, clotted blood and fatty tissue, and dried (ideally, with absorbent towels). Meat then should be well-chilled, wrapped or double-wrapped in air-tight moisture/vapor-proof freezer paper or bags, and placed in a freezer away from its walls, and frozen as rapidly as possible at the freezer's lowest setting (to prevent formation of ice crystals in the meat fibers). Preferably, meat can be frozen with air space around each piece (stacking causes differential freezing). Once frozen completely, the meat should be kept frozen at 0°F (–18°C). At lower temperatures, there is greater risk of freezer burn (dehydration that discolors and changes the fiber consistency, but does not ruin meat); at higher temperatures, storage life (i.e., palatability) is reduced. As a rule, properly packaged, frozen and stored moose meat can be kept up to 16 months before meat quality begins to decline gradually. The same applies to ground moose (burger), unless beef or pork fat has been added, in which case, the mixture should be consumed within 6 to 8 months. *Photo by H.R. Timmermann.*

at these sites and these deposits frequently are associated in moose with the rump, loin, ribs and brisket. When fat is burned rapidly, as seen during the rut, the areolar tissue remains as a yellowish sometimes slimy-appearing tissue. Eventually, it shrinks and disappears. But it is burned so rapidly in rutting bulls that the tissue remains, and the yellow-brown slimy appearance is common. Hunters may attribute this to injury, and tend to discard the meat as being unfit for human consumption. However, muscles associated with this anomaly are not negatively affected and are suitable for human use.

Cadmium

The heavy metal cadmium has been found in the liver, kidneys and muscle of moose in Manitoba, Newfoundland, Ontario, Quebec and the northeastern states (Crête et al. 1986b, Scanlon et al. 1986, Glooschenko et al. 1988, Brazil and Ferguson 1989). Highest concentrations generally are in the kidney, followed by liver and muscle. Regardless of gender, older animals have higher concentrations of the metal. In some instances, the source is industrial pollution; in other cases, cadmium is naturally occurring. Concentrations in the liver and kidneys may exceed daily intake levels recommended for humans, and some jurisdictions have warned hunters not to eat the kidneys of moose or to consume no more than one meal of liver per week. Most hunters only have one or two meals of moose liver per season, and this amount does not pose a health concern. The safest course, however, is not to eat moose liver or kidneys at all.

Pus Pockets

Pus-filled cysts may be encountered in the butchering of a moose carcass. These result from infections of cuts, punctures and other wounds. In some cases, these "pockets" are totally enclosed and can be easily cut out. In other cases, where sinus tracts lead into adjacent tissue, hunters are advised to remove all the infected meat and some of the adjacent healthy meat.

Hunters and butchers may encounter large cysts filled with a clear, amber fluid. This is a seroma, and the fluid is blood plasma, also the result of an old injury, and can be readily removed.

Fatty Liver

Hunters sometimes note that the livers of bull moose taken during the rut period look unhealthy, therefore discard this organ. The condition is known as "fatty liver," and is seen in most rutting bulls (see Chapter 2). The liver appears somewhat jaundiced, friable (easily broken), and has structures resembling small glass balls on the broken surface. The latter are liver cells containing fat. During the rut, bulls reduce their food intake and metabolize fat reserves accumulated over the summer period. Contrary to what most hunters believe, such livers are edible.

Fibrinous Liver

On occasion, a moose liver will appear whitish with small plaques of fibrin on the surface, especially the diaphragm (convex surface) side. This can be peeled off, or the liver can be eaten as is.

Liver Fluke

Moose that cohabit range with white-tailed deer or elk harboring liver flukes frequently become infected with these parasites, which cause major damage to the liver. Infected livers are discolored and have large cysts containing pussy, dark-colored material. Such livers often are enlarged and as much as twice as heavy as a normal adult moose liver (about 10 pounds [4.5 kg]). Moose livers so infected are unfit for human consumption and should be discarded, but the edibility of other meat is not affected. For a more detailed discussion of this condition, hunters should consult Chapter 15, especially those who hunt in an area where the condition is endemic in moose.

Liver Tapeworm Larva

The thin-necked bladderworm is found frequently in the liver of moose taken in areas inhabited by gray wolves. The latter functions as the definitive host in the tapeworm life cycle. The cyst—ranging in number per liver from 1 to 12, and averaging 4—resembles a water blister on the surface of the liver and on occasion internally. The white head of the larva is visible inside each cyst. These larvae do not develop in humans, and can be readily removed from moose liver with a knife and destroyed. Like wolves, domestic dogs can be hosts in the life history of this parasite, therefore should not be fed liver with the cysts or suspected of possible infection, as noted earlier.

Muscle Measles

The term "muscle measles" is used to describe the presence of the larval form of the tapeworm *Taenia krabbei* in muscle (both skeletal and heart) and connective tissue. These larvae are about pea size and do not pose a risk to those eating moose meat, but they are not aesthetically pleasing. Everyone who has eaten moose meat from areas inhabited by gray wolves likely has consumed these parasites, as wolves are the definitive host in this tapeworm's life cycle. All members of the canid family function as hosts for the parasite, so again it is recommended that uncooked moose meat not be fed to dogs. The larvae commonly are found on the outer surface of the heart ventricles, and the presence of the parasite here is a sure sign of infection in other muscles. However, absence in the heart does not signify absence in the skeletal muscles. The larva also may occur in the tongue. In heavily infected moose, there can be as many as two to three larva per square inch (0.31–0.47/cm^2) of muscle.

Winter Tick

The winter tick is an external parasite that generally attaches to moose during late September and early October. By November and December, they are well established on moose. Small rust-colored larval ticks, about the size of the head of a pin, can be seen at the base of hairs. Some develop to about the size of a pea.

The presence of this parasite does not make moose flesh inedible. As the moose carcass cools, the larvae drop off. On occasion, hunters brush against vegetation where larvae have concentrated, and these larvae will attach to clothing. Larval ticks are rust-colored and can be brushed off readily. They do not live on humans.

Damaged Antlers

Damaged moose antlers are not uncommon. Damage can occur during the growing period or the rut. In the former instance, the antler may cease to grow; a bull can have one fully developed antler and a stub (see Chapter 2).

Antlers damaged during the rut have broken tines or portions of various size broken off the main beam. In some cases, the beam may break a short distance from the pedicle. Such occurrences are commonplace and should cause no concern to the hunter in terms of meat edibility. Furthermore, the presence of peruke antlers also does not affect meat edibility.

Weight

Most hunters have heard stories of 2,000-pound (907-kg) moose. But the stories are just that. The only 2,000-pound moose on record is every one that has been carried, quartered or whole, more than mile (1.6 km) to camp.

Crichton (1979, 1980) found that the average live weight of adult bulls from Hecla Island, in Lake Winnipeg, Manitoba, in early December, was 950 pounds (431 kg), with a maximum of 1,200 pounds (544 kg). Cows averaged 830 pounds (376 kg), and calves averaged about 400 pounds (181 kg) at that time of year. The weights of cow moose in eastern Manitoba were similar to those from Hecla Island, but bulls from eastern Manitoba were significantly larger than Hecla Island bulls, with some exceeding 1,600 pounds (726 kg) in early December.

Quinn and Aho (1989) reported that the mean weight of adult bulls in Ontario was 999 pounds (453 kg); that of cows was 959 pounds (435 kg). It should be noted that these animals were captured in winter, after antler shedding.

The largest subspecies of moose is the Alaskan/Yukon moose (see Chapter 2). For Alaskan moose at the Alaska Department of Fish and Game's Moose Research Center, the heaviest bull (6 years old) weighed 1,697 pounds (770 kg) (D. Johnson personal communication: 1989). Several mature bulls at the Center have weighed more than 1,650 pounds (748 kg). The heaviest female weighed 1,323 pounds (600 kg), at age 5 years (C. Schwartz personal communication: 1993).

Hunters frequently speculate about how much of a moose's whole weight is lost to dressing. Crichton (1979, 1980) reported a 30 percent reduction from live weight to dressed weight for adult bulls and cows and a 38 percent difference for calves. By knowing the dressed weight (minus liver, heart, lungs, stomach, intestines and blood), the live weight of moose can be calculated by increasing the dressed weight of adult bulls and cows by 46 percent and by 61 percent for calves.

I suggest that the four quarters (including the ribs) without the hide, feet (removed at the knee) and head represent approximately 50 percent of live weight in early December.

Using the 50 percent rule of thumb, I have taken adult moose in Manitoba in late September that figured to weigh more than 1,500 pounds (680 kg) and a 2.5-year-old bull that was calculated to weigh 1,100 pounds (499 kg).

Trophies

Antler Scoring

Every moose taken legally and ethically is a trophy in many respects. In addition, some hunters—if not most—are fascinated with the prospect of taking a bull with large antlers. Supposedly, large antlers represent an animal of superior hunting challenge, because of its genetic make-up, elusiveness and scarcity. So intense is the fascination that the term "trophy" usually has referred to moose rated by antler size and conformation as the biggest and best ever since a standardized method of measurement was established. For North American big game, including Canada moose (*Alces alces americana* and *A. a. andersoni*), Alaskan/Yukon moose (*A. a. gigas*) and Wyoming or Shira's moose (*A. a. shirasi*), the trophy standards (official scoring system) were initiated by the Boone and Crockett Club, currently headquartered in Missoula, Montana, in the early 1930s. The Club has continued and refined the system and publishes revised lists periodically. Since 1958, the Pope and Young Club, in Chatfield, Minnesota, has certified trophy big game taken by bow and arrow. And since 1988, the Longhunter Association of Friendship, Indiana, has recorded trophy big game

Table 65. Minimum trophy antler scores for North American moose, 1995[a]

	Moose subspecies		
Source	Alaska/Yukon	Canada	Wyoming
Pope and Young Club[b]	170	135	115
Longhunter Association[c]	180	145	125
Boone and Crockett Club[d]			
Record book	210	185	140
All-time	224	195	155

[a] Based on the Boone and Crockett Club's Official Scoring System.

[b] Moose taken with bow and arrow.

[c] Moose taken with muzzleloader.

[d] Moose taken during current (latest) scoring period.

taken by muzzleloaders. Both Pope and Young and Longhunter use the Boone and Crockett scoring system (Table 65).

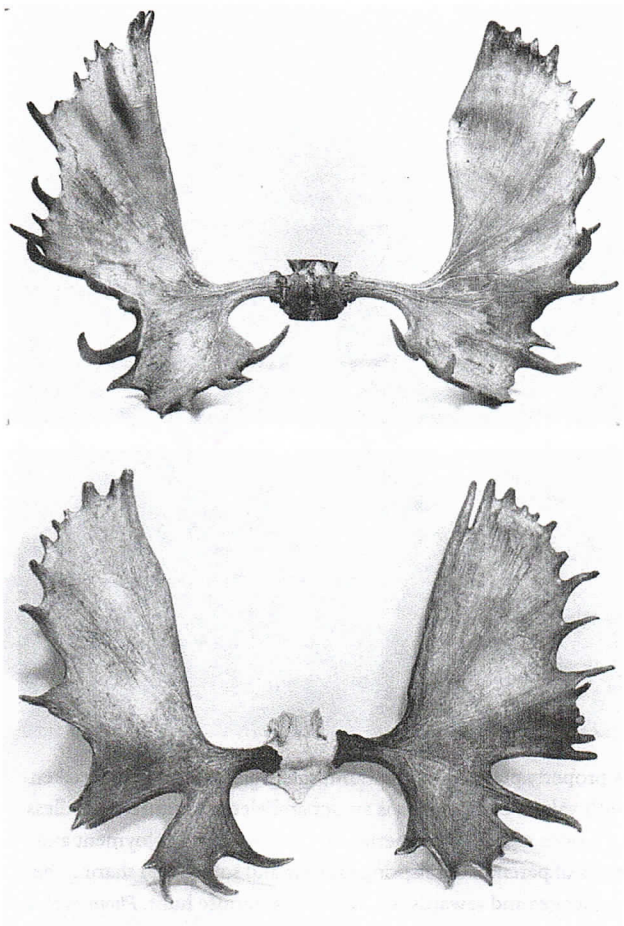
An antler score is cumulative, using the maximum width, number of points on each side, length and width of the palms, and circumference around the base of the antler. From this score, the difference between each palm is subtracted, and that result is the final score. All scoring is done to the nearest eighth inch. Because of anomalies and decisions as to what is or is not a point, all hunters interested in having the antlers scored are advised to contact the Boone and Crockett Club for a list of scorers in a particular area.

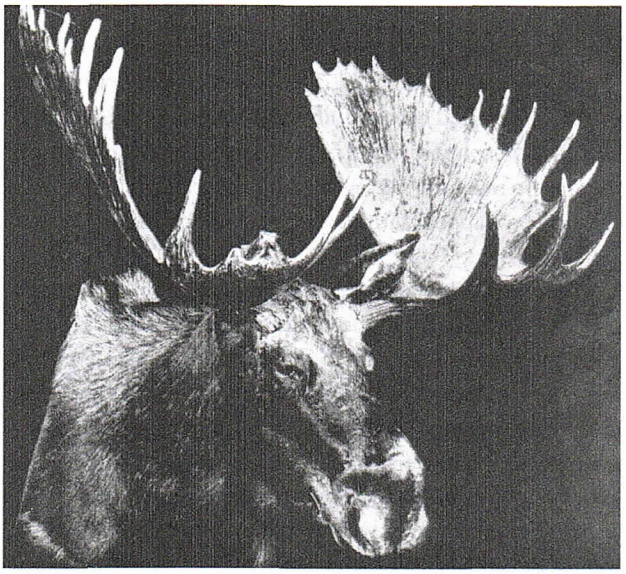
Mount Preparation

As noted earlier, a decision to have the animal's head mounted must be made before any skinning occurs. Also before skinning, photographs should be taken of the head from different angles, and circumference measurements taken of the neck immediately behind the ears, half way to the base of the neck and at the base. Obviously, the hunter who plans on mounting a moose head, if a trophy animal is bagged, should carry a camera that is not cumbersome and can be kept weather-proofed. Measurement also should be made of the length of the head starting at the hairless spot on the front of the nose to a point midway between each antler. These reference items will greatly aid the taxidermist. If a tape measure is not available, a piece of string will do, by tying knots in it at the appropriate spot and remembering which length is for what measurement. The very best advice is to consult with a taxidermist before the hunt about mounting and his recommendations.

Figure 236 illustrates the skinning cut lines to be used if a full head mount is desired. Skinning the neck and front shoulders is not complicated, but more caution is required with the ears, eyes and lips. If the hunter is unfamiliar with the procedure and technique, consultation with the taxidermist or simply taking it to the taxidermist as soon as possible for this delicate work is recommended. The head and hide should be kept cool, and the hide should not be wrapped around the head until it has cooled sufficiently, otherwise the hair may "slip" during tanning.

When incisions are made, the throat area must not be cut. All cuts should be made on top of the neck, with care





World record moose antlers (as of 1996) in the three Boone and Crockett Club categories include: (top left) Alaskan/Yukon moose (score 261 5/8), taken by John A. Crouse, September 1994, near Fortymile River in Alaska; (bottom left) Canada moose (score 242), taken by Michael E. Laub in 1980 near Grayling River, British Columbia; and (above) Wyoming or Shira's moose (score 205 4/8), taken by John M. Oakley in 1952 near Green River Lake, Wyoming. *Photos courtesy of the Boone and Crockett Club.*

Figure 236. Skinning cut lines (dashed line) for a moose head/cape mount and cut/saw line (dotted line) for antler mount (from Monk and Buss 1990). Such cuts should be made from the inside out to avoid cutting the hair shafts.

given to cutting outward, as discussed earlier, to avoid cutting the hair. Once the skin is free, any flesh adhering to it should be scraped off carefully. The head hide should then be salted thoroughly; if the hide can be frozen immediately, there is no need for salting. Finally, for transport, the hide should be wrapped with burlap or other cloth bag, *but not plastic*.

When removing antlers, enough of the top of the skull must be sawed off for the taxidermist to use as a guide when placing them on a form for mounting. Cuts should be from the back of the skull toward the front, exiting the skull in the eye sockets. This will ensure that enough bone remains with the antlers. If a bullet has caused damage, the antler can be repaired by a taxidermist.

Many hunters prefer simply to bleach the skull plate and mount the antlers on a plaque without any padding. Before bleaching, the skull plate should be boiled to remove any adhering meat, fat and connective tissue. Once this is done, bleaching can be accomplished with a commercial peroxide.

Cooking

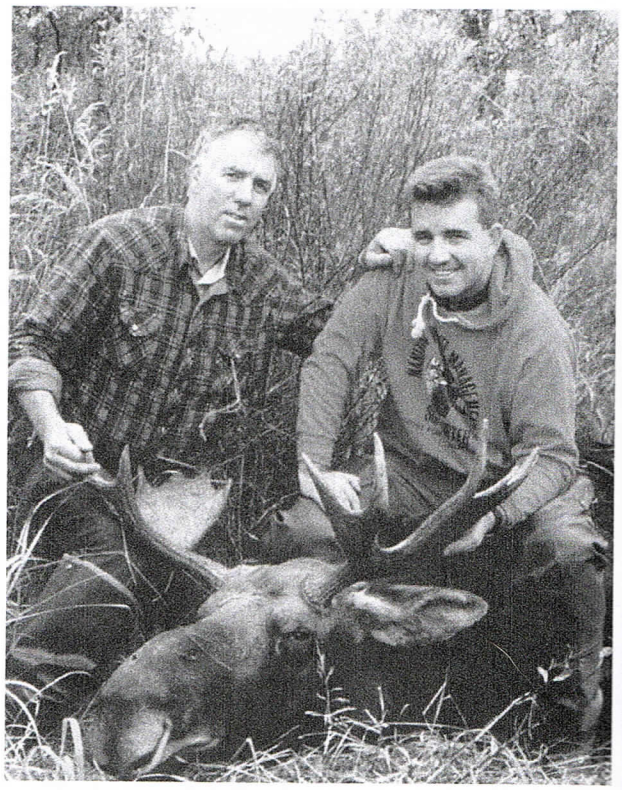
Moose meat is lean without much fat in the muscle bundles. Consequently, well-cooked moose meat tends to be dry. To overcome this, extra fluids or a source of fat should be added during cooking. Marinades add moisture and tenderize roasts and steaks. Incisions can be made in roasts and small strips of bacon inserted. But the best safeguard is not to overcook the meat.

For preparing ground moose (burger), some pork or beef fat may be added (15 percent is recommended for lean meat) to provide additional fat. Beef fat supplement usually is preferred because it preserves longer when frozen. Another alternative is to package ground moose without fat added, but mix it with ground beef when thawed for cooking. However, moose burger, by itself, is lean and tasty.

The key to freezer storage of moose and other meats is judicious wrapping. Also, meat to be frozen should be carefully packaged in high-quality freezer wrap, *not* freezer bags. The wrap can avoid freezer burning for 2 years or more; freezer burn is likely in less than a year with freezer bags.

Conclusion

Concern exists for the future of hunting in North America. Hunters and other advocates of this recreational pursuit must become more vocal in pressing the cause for main-



A properly planned moose hunt, safely and ethically undertaken with valued companions is an unparalleled adventure, regardless of moose taken. Few experiences can match the enjoyment and bond of parent and offspring (author and son above) sharing the challenges and rewards of a wilderness moose hunt. *Photo by Ross Singleton.*

taining hunting's values and traditions, for they mirror the best qualities of the environment. Proponents should be urged to address hunting as an integral aspect of wildlife management, and as an important economic, recreational and cultural contribution. Toward this end, hunters should encourage wildlife management agencies to provide short courses on wildlife biology and management.

Hunting is a pursuit, but it is also the mornings, the nights, the seasons, the lands, the waters, the animals and the sensory grandeur of the outdoors that is poorly articulated but wonderfully experienced. Hunting is a unique and incomparable kinship with North America's wildlife heritage and a foremost link to natural resource conservation. It is a privilege to be enjoyed and protected.