


3 copies

What you need to know before and after the hunt

930604 MINNESOTA

LEGISLATIVE REFERENCE LIBRARY
 SK302 .M56 1993
 - 1993 Minnesota moose hunt.



3 0307 0062 0669

E HUNT



SK
302
.M56
1993



1993 Minnesota Moose Hunt

Dear Moose Hunter:

Congratulations! You have been selected to participate in the 1993 Minnesota Moose Hunt. The moose hunt is now a once-in-a-lifetime opportunity. We hope your hunt is safe, enjoyable, successful, and memorable.

This booklet contains information on moose hunting regulations, orientation sessions, registration, and other provisions needed to legally hunt this big-game species. Please read this booklet carefully. It contains information that beginners and experienced moose hunters will find valuable, including map sources, equipment options, recommended rifle calibers, moose anatomy, and care of the moose after it is down. We hope you find this information useful as you plan and participate in your hunt.

Be careful to not let the excitement of bagging a moose overcome your awareness of hunter safety, etiquette, and ethics. Other large animals such as deer or domestic livestock may also be present in the area where you are hunting, so be sure of your target. And treat other moose hunters and outdoor users with respect.

Again, congratulations and good luck.

Sincerely,

A handwritten signature in cursive script that reads "Tim Bremicker".

Tim Bremicker, Chief
Section of Wildlife

Note: Illustrations on pages 16, 23-27, and 30 have been reproduced from The Moose in Ontario, Book II, and portions of information in the chapter entitled "Step-by-Step Field Care," pages 23-30, have been adapted from The Moose in Ontario, Book II with permission for the Ontario Ministry of Natural Resources.

RECEIVED
DEC 07 1993
LEGISLATIVE REFERENCE LIBRARY
STATE CAPITOL
ST. PAUL, MN. 55155

Contents

General Information 1

Regulations5

1993 Moose Hunter Orientation 11

Registration 14

Moose Hunt Facts.....15

Moose Anatomy and Shot Placement 15

Field Dressing and Care of Meat 18

Step-by-Step Field Care.....23

Sunrise/Sunset Table31



Leonard Lee Rue III

Minnesota is one of only a few states with a moose population large enough to sustain a hunting season.

General Information

MOOSE SEAL

Enclosed in this packet is your moose seal. Please handle the seal carefully. It is easily voided. Once it has been sealed, it cannot be reopened.

ZONE BOUNDARIES

Please study the map of your zone provided in the application booklet, and be familiar with your zone boundaries. If you have questions about a boundary, detailed descriptions of your zone can be obtained by calling the DNR Information Center at (800) 766-6000.

REPORT SICK OR DEAD MOOSE OR MOOSE REMAINS

Please report the location of any sick moose or moose remains you find while hunting to the nearest registration station. This information helps managers determine the incidence of disease and losses of moose from all causes.

NO REFUNDS

The moose hunt is conducted to manage moose populations and provide recreation. A

license is not a bill of sale for meat. If the moose your party kills is inedible for any reason, no license fee refund or replacement moose is allowed.

PROPER CARE OF MEAT

Do not allow your moose meat to spoil. Please study the field dressing and care of moose meat information in this booklet. Wanton waste laws will be enforced.

ORIENTATION SESSIONS

Orientation sessions are mandatory in the northeast and for Zone 2 in the northwest. In addition, voluntary sessions will be held for the northwest. See page 12.

RECOMMENDED FIREARMS AND BOW AND ARROW EQUIPMENT

Moose hunters should be properly armed and proficient with their arms to make a clean kill and avoid the possible loss of a wounded animal. The DNR requests that all hunters follow these arms recommendations:

Firearms

(See page 8 for a description of legal firearms.)

The following cartridges are adequate for hunting moose, if lightly constructed "varmint" bullets are not used and the bullet weight is at least 130 grains. Magnum cartridges are not necessary, but a bullet designed for deep penetration and

controlled explosion is recommended:

.270 Win., .280 Rem., 7x57 mm., .284 Win., .30-06 Sprfld., .30-40 Krag, .300 Sav., .303 British, .307 Win., .308 Win., 8 mm Mauser, .348 Win., .358 Win., and .444 Marlin.

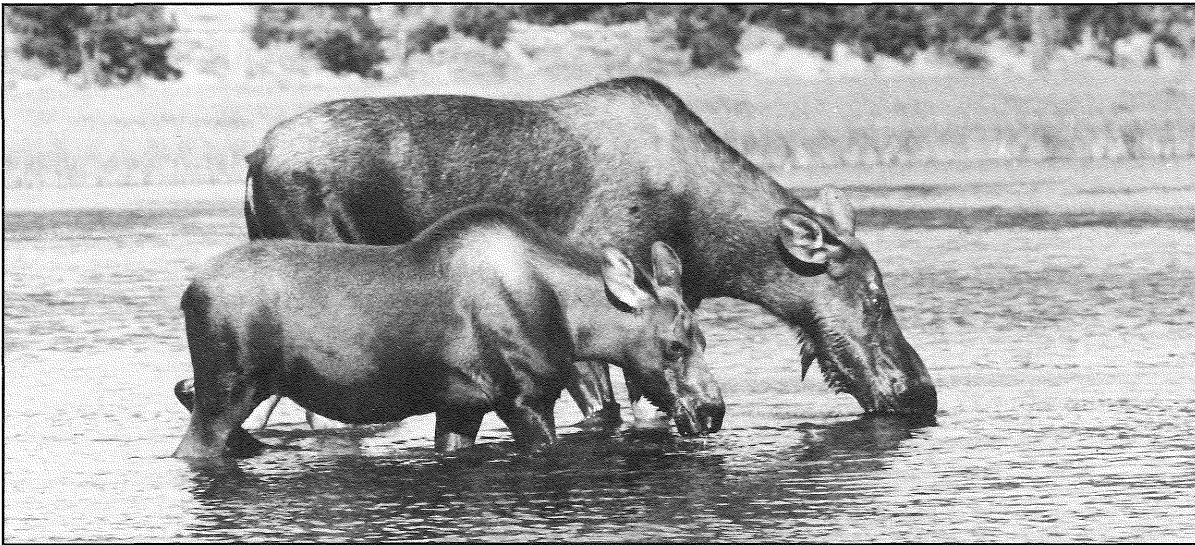
The DNR does not recommend the following cartridges for shooting moose: .243 or .244 (6 mm), .250 (.250/3000), .25-06, .257 Roberts, .30-30 Win., .30 Rem., .303 Sav., .32 Win. Spec., .32 Rem., .32-40 Win., .35 Rem., .352 Win., .38-40 Win., .38-55 Win., .44 Mag., .44-40 Win., and .45-70 Govt. (though this latter cartridge could be hand-loaded to an acceptable quality in a modern rifle).

Archery

The DNR urges that only highly qualified archers and experienced big-game hunters attempt to take moose with a bow and arrow. The Pope and Young Club considers a 60-pound draw weight the minimum for moose hunting. Arrows must conform to Minnesota legal standards for taking big game.

Muzzleloaders

Muzzle-loaded guns must conform to Minnesota legal standards. An effective moose load should deliver at least 1,500 foot-pounds of energy at 100 yards. Black-



Leonard Lee Rye III

Calves grow rapidly during their first eight months, especially when they have access to plenty of aquatic plants. After one year, a young moose can weigh as much as 500 pounds.

powder loading manuals describe how to achieve this power. Caution: Not all guns are safe with such loads.

Handguns

State law allows all species of big game to be taken with a handgun, but handguns are not recommended for taking moose. If used, handguns must use centerfire ammunition with a case length of at least 1.285 inches and a projectile diameter of at least .23 inch, except the .30 caliber M-1 cartridge may not be used. The .357 magnum is not adequate for taking moose and the DNR asks hunters to not use it.

HUNTER PREPARATION

Hunters must be prepared to maneuver a 600- to 900-pound animal. You'll need good knives, a saw or light axe to split the brisket and pelvis, plenty of strong rope, plus a block and tackle to move and hoist the animal. For equipment recommendations, see page 21.

MULTIPLE KILLS

To avoid taking more than one moose, each party should: 1) have pre-arranged signals to tell party members if a moose has been shot; 2) hunt close enough together as a party so the signals can be easily heard; 3) agree before the hunt on the age or sex of moose to take if multiple moose are observed at a site while hunting.

ZONE 2 INFORMATION

All parties hunting in Zone 2 are required to report to the Agassiz check station before they begin hunting. At the check station, local moose movements and hunting conditions will be discussed with each party. The check station is located at the Refuge Headquarters, 11 miles east of Holt on County Road 7.

All moose killed in Zone 2 must be registered at the Agassiz National Wildlife Refuge check station within 48 hours. Information on orientation and registration will be sent to Zone 2 hunters by Agassiz National Wildlife Refuge staff.

SUPERIOR NATIONAL FOREST INFORMATION

The U.S. Forest Service (USFS) is responsible for the management of Superior National Forest lands, including the Boundary Waters Canoe Area Wilderness. For information about campgrounds and regulations, contact: Forest Supervisor, Superior National Forest, P.O. Box 338, Duluth, MN 55801 phone: (218) 720-5324.

SPECIAL PROVISIONS FOR THE BOUNDARY WATERS CANOE AREA WILDERNESS (BWCAW)

Note: All or portions of northeastern Minnesota Moose Hunt Zones 20, 21, 22, 23, 24, 25, 32, 33, 60, 61, 62, 63, 70, 72, 73, and 74

are within the Boundary Waters Canoe Area Wilderness (BWCAW). The following regulations apply to all BWCAW users:

Motorboats

Outboard motors are permitted only on designated lakes and streams within the BWCAW. Most BWCAW waters within the moose hunt zones are off-limits for motor boats. Please call the Superior National Forest Headquarters in Duluth, (218) 720-5324, for information regarding motorboat use.

Other Mechanized Equipment

No machines are permitted in the BWCAW. The ban on machines includes wheels of any kind, chainsaws, and snowmobiles.

Wilderness Travel Permits

Information regarding travel permits (required for overnight travel from May 1 to September 30) and other regulations in the BWCAW may be obtained by calling the U.S. Forest Service in Duluth, (218) 270-5440, or by writing to: Superior National Forest, P.O. Box 338, Duluth, MN 55801. Reservations cost \$5.

Campsites

Camping in the BWCAW is restricted to designated sites.

Can and Bottle Ban

No cans and bottles are allowed in the BWCAW except those containing fuel, medicine, toothpaste, insect repellent, or other items that are neither food nor beverage. All empty containers and other refuse must be burned or packed out.

BWCAW Preparation

The BWCAW provides a high-quality moose hunt. However, BWCAW travellers must be prepared for wilderness camping and travel. The following suggestions will help you prepare for a BWCAW hunt.

- October is a month of extremely variable weather. Hunters must be prepared for days of rain or snow and freezing temperatures. Hypothermia is a real danger. Proper clothing and equipment are essential to survival if you will be more than one or two hours from warm, dry shelter.
- Do not wear cotton or down clothing. Wear only wool, polypropylene, or other synthetic materials which do not lose their insulative qualities when wet. You need head-to-toe waterproof covering. Waterproof boots or overboots at least knee-high are recommended for loading and unloading canoes, but footwear must also provide support for packing heavy loads. Wear wool or waterproof handwear.

- Your tent and packs must be truly waterproof and suited for early winter camping. Bring a waterproof tarp large enough to provide a canopy for eating meals or drying clothing. Test all equipment before you go.
- Your canoes must have at least six inches of freeboard with 1,000-pound loads. You need previous experience with rough-water, heavy-load canoeing. Be prepared and patient enough to wait out bad weather or other dangerous situations.

MAP SOURCES

Topographic maps are available from local outfitters, sporting goods or map stores, and the Minnesota Geological Survey office in St. Paul, (612) 627-4782.

County highway maps and Public Recreation Information Maps (PRIM) are available from the Minnesota State Document Center, (612) 297-3000 or (800) 652-3757.

BWCAW maps are available from local outfitters, sporting goods and map stores, and the Minnesota State Documents Center (see above).

Superior National Forest maps are available for \$3.25 from the U.S. Forest Service at its offices in Duluth, Ely, Tofte, Cook, Virginia and Grand Marais. For more information, call (218) 720-5324.

Moose Hunting Regulations

TRESPASS LAW

Always ask permission before entering private land. If you are convicted of violating trespass laws, you will lose your hunting license and may be subject to fines and possibly a jail sentence. All DNR conservation officers and all other licensed peace officers enforce trespass laws. The following is a summary of the Minnesota Trespass Law:

Restrictions

- A person may not enter legally posted land to take a wild animal without permission.
- A person may not enter agricultural land, including Conservation Reserve Program (CRP) land, to take a wild animal or operate a motor vehicle for recreation without permission. If in doubt whether land is CRP or not, ask the landowner.
- A person may not enter private land to take a wild animal after being told not to do so.

- On agricultural land or public right-of-way, a person may not take a wild animal with a firearm within 500 feet of a building occupied by humans or live stock without written permission.
- On non agricultural land, a person may not take a wild animal with a firearm within 200 feet of a building occupied by a human without verbal permission.
- A person may not take a wild animal with a firearm within 500 feet of a corral containing livestock without permission.
- A person may not wound or kill another person's domestic animal or destroy private property.
- A person may not pass through a closed gate without returning it to the original position.
- No person (including the lessee) may hunt on any land leased from the state that has been legally posted by the lessee to prohibit hunting.

Exceptions

- A hunter on foot may retrieve wounded game from agricultural land that is not legally posted, unless the hunter has been told not to do so.
- A person may enter any private land to retrieve a dog that has treed or is at bay with a raccoon, bobcat, coyote or fox.



DNR Staff Photo

Moose are often found in Minnesota's most isolated wilderness areas. Yet they also live near northern farms, towns, and resorts.

After retrieving the dog, the person must immediately leave the premises. This exception does not authorize the taking of the wild animal.

Definitions and Posting Requirements

“Agricultural Land” is land that is: plowed or tilled; has standing crops or crop residue; is within a maintained fence for enclosing domestic livestock; or is enrolled in the Conservation Reserve Program or the state RIM Reserve Program.

To be legally posted land must have signs posted along the boundaries every 1,000 feet or less. In wooded areas where boundaries are less distinct, signs must be posted at intervals of 500 feet or less. Signs must have lettering at least two inches high and have the signature of the owner, occupant, lessee, or authorized public land manager. An unauthorized person may not post land with signs prohibiting trespass.

Notification to stay off private land, or legal permission to enter private land or take wild animals near occupied buildings or corrals may only be given by the owner, occupant or lessee.

Penalties

Violating the Minnesota Trespass Law is at the least a misdemeanor. In addition, it is a gross misdemeanor to: knowingly disregard signs prohibiting trespass; trespass after being told not to do so; or violate the trespass law twice within a three-year period.

Anyone convicted of violating the trespass law while hunting, fishing, trapping or snowmobiling will have the applicable license for that activity revoked. Anyone convicted of a gross misdemeanor under this law will have all hunting privileges suspended for two years.

LICENSING

Moose hunting licenses are available to Minnesota residents only. License applicants must apply as a party of four. Successful applicants are chosen in a random drawing.

The license fee is \$275 per party of four persons. Licenses are valid only for the zone selected, except for taking nuisance moose under special permit (see page 11). All moose hunters must have their license and an unused seal in their personal possession when hunting or when transporting a moose or its parts.

Moose hunting licenses are not transferable.

Military leave papers cannot be used in lieu of a moose license and nonresident military personnel stationed in Minnesota cannot be considered as residents for purposes of moose license applications.

HUNTING SEASON

The 1993 moose hunting season dates are as follows:

Zones 20–80 (Northeast)

October 9–24

Zones 3–10, 14–17 (Northwest)

October 9–17

Zone 2* (Northwest)

December 4–12

*Zone 2 includes Agassiz National Wildlife Refuge and Eckvoll, Elm Lake and Mud Lac state wildlife management areas.

Hunters may hunt moose only in the zone for which they are licensed.

SHOOTING HOURS

Legal shooting hours are one-half hour before sunrise to sunset.

BAG LIMIT

The bag limit is one moose of any age or either sex per licensed party of four hunters. Under no circumstances shall any party take more than one moose.

LEGAL FIREARMS

Note: See page 1 for further information about firearms recommended for moose hunting.

A rifle, shotgun, muzzleloader, or handgun is legal for taking moose if:

- it is at least .23 caliber;
- it is loaded only with single projectile ammunition;
- the projectile used has a soft point or is an expanding bullet type;
- the ammunition has a case length of at least 1.285 inches, with the exception of a 10 mm cartridge that is at least .95 inches long;
- the smooth-bore muzzleloader used is at least .45 caliber; and
- the rifled muzzleloader used is at least .40 caliber.

Other Restrictions

- A person may not take big game with a .30 caliber M-1 carbine.
- Rifled barrels on shotguns are legal statewide.

Handguns

- Moose may be taken with handguns that meet the definition of legal firearms. However, the use of handguns to take moose is not recommended.

Muzzleloader

- Moose may be taken with muzzleloaders that meet the definition of legal firearms.

LEGAL BOWS AND ARROWS

Note: See page 2 for further information about bows and arrows recommended for moose hunting.

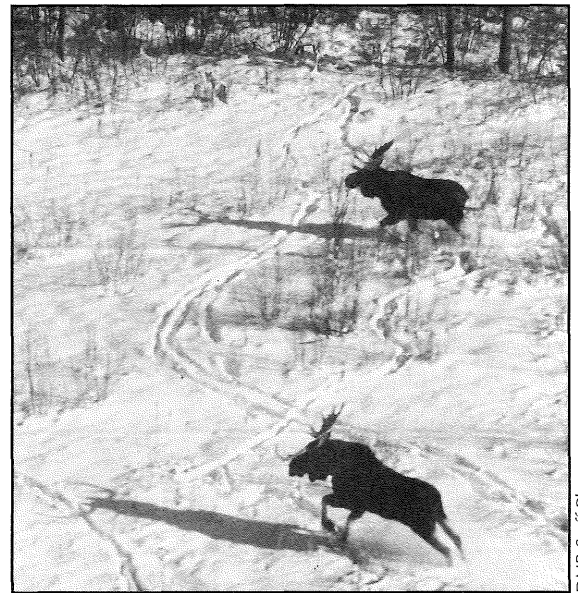
- Bows must have a pull no less than 40 pounds at or before full draw.
- Arrowheads used for taking moose must be sharp, have a minimum of two metal cutting edges, be of barbless broadhead design, and have a diameter of at least $\frac{7}{8}$ inch.
- No person may hunt with a bow drawn, held, or released by a mechanical device, except disabled hunters who have a crossbow permit.
- A hand-held mechanical release attached to the bowstring may be used if the person's own strength draws and holds the bowstring.
- No person may hunt moose with a crossbow, except by special permit issued to hunters unable to hunt by archery because of a temporary or permanent disability. This disability must be verified in writing by a licensed physician. The permit application is available from any DNR regional office.

Archery Restrictions

- A person may not take moose by archery while in possession of a firearm.

SHOOTING FROM ROADWAYS

No person may discharge a firearm or an arrow from a bow on, over, across, or within the right-of-way of an improved public highway (including but not limited to federal, state, county, and township roadways) at a big game animal or a decoy of a big game animal that has been set out by a licensed peace officer.



DNR Staff Photo

An adult bull moose can weigh five to ten times as much as a whitetail buck. To properly field dress an animal this big takes careful planning and far more equipment than most deer hunters are used to carrying.

REFUGES CLOSED

All game refuges are closed to moose hunting except the Agassiz National Wildlife Refuge in Marshall County (subject to federal regulations) in Zone 2, the Clay County Refuge in Zone 15, and the Rothsay Wildlife Management Area Sanctuary in Zone 16.

USE OF DOGS AND HORSES

A person may not use a dog or horse to take moose.

PARTY HUNTING

Licensees may not hunt moose without having the unused seal in their party's possession. Licensed parties may not assist other licensed parties in taking moose.

MIXED WEAPONS PARTIES

Licensed moose hunt parties may consist of individuals hunting with bow and arrow and individuals hunting with firearms.

BLAZE ORANGE OR RED REQUIRED

The visible portion of a hunter's cap, if worn, and outer clothing above the waist, excluding sleeves and gloves, must be bright red or blaze orange. Blaze orange includes a camouflage pattern of at least 50 percent blaze orange within each square foot.

TAGGING

A moose may not be transported or

possessed unless the seal bearing the license number of the party taking the moose and the year of its issue has been affixed to the carcass in one of the following locations: 1) between the tendon and the bone of a hind leg and fastened around either the bone or the tendon; 2) around the base of either antler; or 3) through a slit cut through either ear.

The seal must be fastened so it cannot be readily removed from the moose at the site of the kill. A person may field dress or hang a moose at the site of the kill, but may not remove it from the site without the tag being attached.

Moose may be skinned, quartered, or further divided before transportation and registration. However, all edible meat and all other parts not left in the field must be presented for registration at the same time, including that portion with the seal.

REGISTRATION

Each moose must be registered within 48 hours of taking. Registration stations are listed on page 14.

TRANSPORTATION OF HEADS OR HIDES

A resident who has a license to take moose may transport the head or hide of the animal within or out of the state for mounting or tanning.

NUISANCE MOOSE

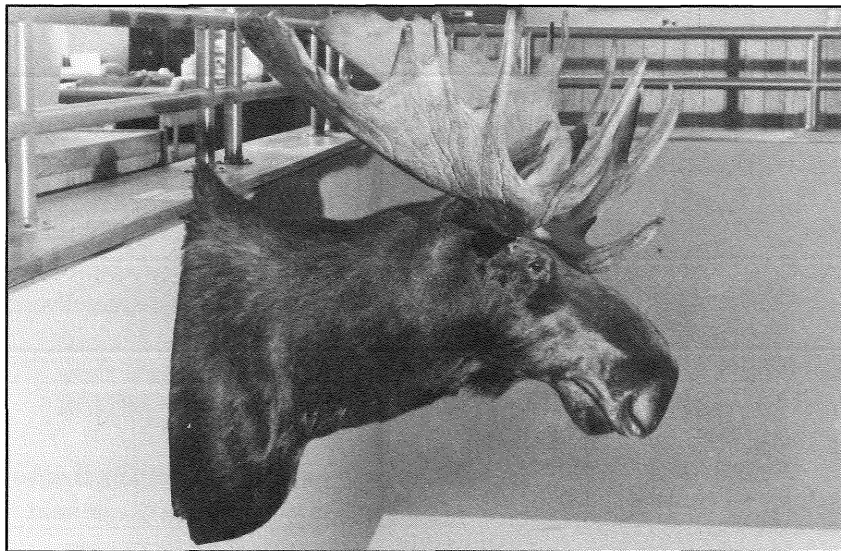
Nuisance moose may be taken under special permit by licensed moose hunters from September 1 to December 31. Permits are issued by DNR conservation officers on a case-by-case basis after the officer determines a nuisance moose problem exists and that killing the moose is the only practical way to alleviate the problem. Each permit shall be restricted to a specified location.

Permits shall be issued to parties of licensed moose hunters, with priority given to parties with licenses valid for the zone where

the damage is occurring. Only one party may hunt under each nuisance moose permit.

Any party taking a moose under a nuisance permit must register it with the officer (or designee) who issued the permit within 48 hours after taking. The moose must be tagged immediately with the locking seal provided with the license. The party may not hunt, kill, or tag another moose during 1993.

Nuisance moose permittees are subject to all provisions not inconsistent with this section and all laws relating to the taking of wild animals.



DNR Staff Photo

This mount, in the DNR headquarters in St. Paul, has a Boone and Crockett preliminary score of 197 $\frac{7}{8}$, number 3 in Minnesota state records. The bull was shot near Ely in 1906.

1993 Moose Hunter Orientation

NORTHWEST ZONES (Voluntary Orientation Attendance Except Zone 2)

Moose hunter orientation is required for Zone 2 (Agassiz National Wildlife Refuge). Refuge officials will notify hunters regarding dates of orientation sessions.

Voluntary moose hunter orientation sessions will be held in both Karlstad and Thief River Falls for hunters in northwest

zones. While these orientation sessions are not mandatory, hunters are encouraged to attend. Information covered during the sessions will include many aspects of moose hunting that should help you increase your chances of finding and bagging a moose. Topics will include moose hunt regulations, moose biology and management, moose hunting methods, and suggested equipment.

	LOCATION	DATES	TIMES
Northwest Zones Orientation	Karlstad (Eagle's Club Meeting Room, Hwy. 59 North)	Thursday, Oct. 7	7 p.m.
		Friday, Oct. 8	1 p.m., 7 p.m.
	Thief River Falls (Northland Community College Auditorium)	Saturday, Sept. 25	1 p.m. only
Saturday, Oct. 2		1 p.m. only	
Friday, Oct. 8		7 p.m. only	
	Thief Lake Check Station	Friday, Oct. 1	7 p.m. only

**NORTHEAST ZONES
(Attendance Required!)**

You must attend an orientation session before hunting in Northeast Zones (Zones 20-80). The purpose of the orientation sessions and their scheduling is to provide information on equipment needs and care of moose meat, and to make moose hunters aware of U.S. Forest Service regulations for the Superior National Forest and the Boundary Waters Canoe Area Wilderness (BWCAW). The sessions also give hunters the opportunity to scout their hunting zone before the hunt starts. Individual licenses are validated at the sessions.

The schedule below shows the locations, dates, and times of the orientation sessions.

Hunters may attend at any given time or location that is convenient to them. All members of a party need not attend at the same time, and those party members not intending to hunt are not required to attend orientation sessions.

For more information on northeast orientation sessions and moose hunting, contact:

Ely Area Wildlife Manager
Fred Thunhorst (218) 365-7280
 Grand Marais Area Wildlife Manager
Bill Peterson (218) 387-2370
 Eveleth Area Wildlife Manager
Jeff Lightfoot (218) 749-7748
 St. Paul DNR, Toll-Free (800) 766-6000

Note: You must bring your license to the orientation session to have it validated.

Northeast Zones Orientation	Location	Dates	Times
	Ely (Vermilion Community College, NE corner of town)	Saturday, Sept. 18	8 a.m., 11 a.m., 2 p.m.
		Saturday, Oct. 2	8 a.m., 11 a.m., 2 p.m.
		Thursday, Oct. 7	7 p.m. only
		Friday, Oct. 8	7 p.m. only
Isabella (Isabella Community Center)	Saturday, Sept. 18	8 a.m., 11 a.m., 2 p.m.	
	Saturday, Oct. 2	8 a.m., 11 a.m., 2 p.m.	
	Friday, Oct. 8	7 p.m. only	
Silver Bay (Kelly High School)	Saturday, Sept. 18	8 a.m., 11 a.m., 2 p.m.	
	Saturday, Oct. 2	8 a.m., 11 a.m., 2 p.m.	
	Thursday, Oct. 7	7 p.m. only	
	Friday, Oct. 8	7 p.m. only	

Moose Registration

Moose must be registered within 48 hours of taking at one of the following registration stations:

Northeast Registration Stations

Ely	DNR Fish & Wildlife Headquarters East End Shagawa Lake, County Rd. 88	9 a.m.-6 p.m. daily
Isabella	U.S. Forest Service Ranger Station, State Hwy. 1	9 a.m.-6 p.m. daily
Tofte	U.S. Forest Service Ranger Station, Hwy. 61	9 a.m.-6 p.m. daily
Eveleth	Wildlife Office Jct Hwy. 37 and 53, south of Eveleth	8 a.m.-4:30 p.m. Monday-Friday

Northwest

Crookston	Paddy & Paul's Phillips 66	Hwy. 2 E.	7 a.m.-9 p.m. Mon-Sat; 8 a.m.-9 p.m. Sun.
Hawley	Riverside Inn	Hwy. 10	11 a.m.-1 a.m.
Karlstad	Hanson Oil (Phillips 66)	Jct. Hwy. 11 & 59	7 a.m.-8 p.m. Mon-Sat 8 a.m.-8 p.m. Sun.
Mahnomen	Ed's 59 Service	Hwy. 59	7 a.m.-11 p.m. Mon-Thurs; 7 a.m.-1 a.m. Fri-Sun.
Roseau River	WMA Headquarters	13 mi. N. of Badger on CR 3	8 a.m.-4:30 p.m. Mon-Fri; Sunrise-Sunset
	(Additional hours if arranged by phone)	(218) 463-1557 or (218) 463-2237	(Opening Weekend)
Thief Lake	WMA Headquarters	10 mi. E., 3 mi. N. Middle River	8 a.m.-6 p.m. daily
Thief River Falls	Amoco 24 Station	1580 Hwy. 59 E.	24 hours daily
Twin Valley	Standard Station	Hwy. 32	7 a.m.-9 p.m. daily

Moose Hunt Facts

- Based on aerial surveys conducted in the winter of 1993, there are an estimated 4,292 moose in a 5,200-square-mile area in the northeast, and an estimated 3,452 moose in a 2,166-square-mile area in the northwest.
- Past moose hunts have been designed to take from 8–15% of the herd in the northeast every two years, and from 10–26% of the herd in the northwest.
- Success rates for the past moose hunts have averaged 93% in the northwest since the first hunt in 1971, and 83% in the northeast.
- In 1989, the last year there were moose hunts held in both the northwest and the northeast, a total of 16,496 party applications were received for 994 available permits. The odds for obtaining a permit ranged from 1 in 9, to 1 in 156.
- Average dressed weights of moose are:
 - Adult bulls—500 to 900 lbs.
 - Adult cows—400 to 600 lbs.
 - Yearlings—300 to 500 lbs.
 - Calves—200 to 300 lbs.
- The moose rutting season in Minnesota begins in early September and extends through late November, with the peak in late September and early October.
- Under a 1988 agreement with the State of

Minnesota, the Bois Forte, Grand Portage, and Fond du Lac Chippewa Indian bands agreed to limit their moose harvest and conduct seasons at the same time as state seasons. The agreement also called for the state to make annual payments to the bands. Since that time, the Fond du Lac band has dropped out of the agreement and now sets its moose seasons independent of the state and other bands. The remaining Chippewa bands in the moose range also set moose seasons and quotas for band members on reservation lands separate from state regulations.

Moose Anatomy and Shot Placement

The moose is the largest game animal in North America and the largest deer in the world. Yet despite the large size of a moose, the vital area for making a quick and humane kill is relatively small. Study the following diagrams of moose anatomy and proper shot placement carefully so you can make your first shot count.

MAKING THE SHOT

When shooting a moose, always aim for the heart-lung area (Figure 1). In addition to these organs, this area also contains the highest concentration of blood vessels. Hits to this area will cause heavy bleeding that cannot be stopped, and death occurs quickly.

Hits to the heart cut off the blood supply to the brain, and the animal becomes unconscious in seconds. Hits in the lungs are also fatal, but the moose may travel a considerable distance before going down—especially if pursued immediately. Most of the bleeding is internal. The animal's movement may cause the skin to move over the entry hole, preventing an obvious blood trail. Blood from the arteries is bright red. If the hit includes the lung area, the blood may also be frothy.

The visible amount of heart-lung target area changes depending on the position of the moose relative to the hunter (Figure 1). All hunters, especially archers, should be aware of the location of the humerus, the large bone between the shoulder and the elbow. When the moose is walking or running, this bone partially protects the heart-lung area. In some positions none of the target area is visible, so the hunter must wait for the moose to move and expose it. For archers, a moose facing away at a 45 degree angle presents the best access to the target area. This shot is not obstructed by ribs or shoulder bones.

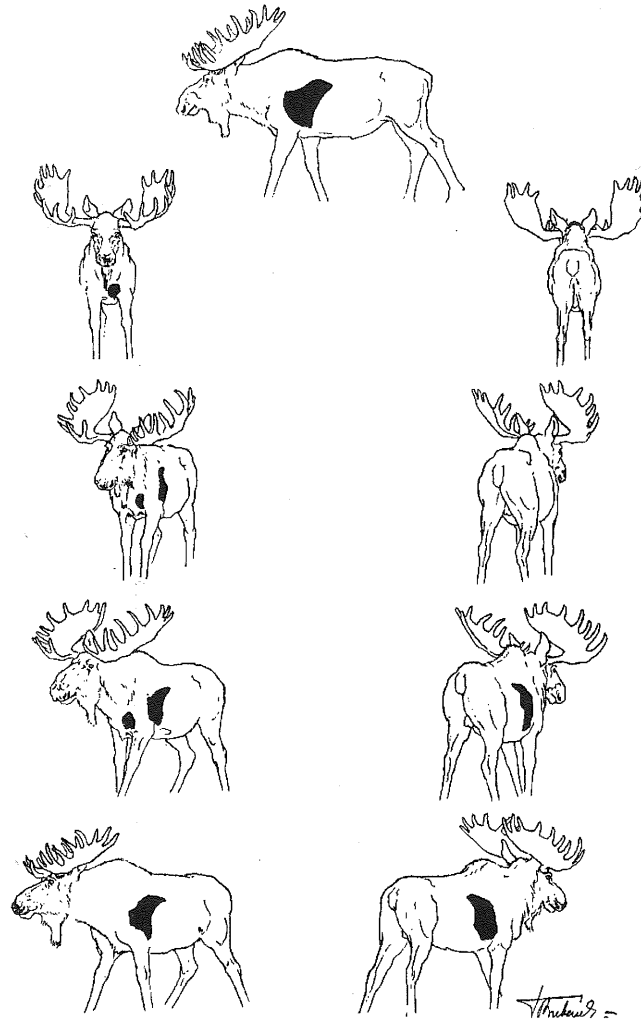


Figure 1. The exposure of the heart-lung target area changes depending on the position of the moose relative to the hunter.

SHOTS TO AVOID

Hits to the liver and spleen cause heavy bleeding, but the moose may still travel a considerable distance after being shot. Blood from such a wound is dark red.

Hits to the rumen (paunch) and intestines are eventually fatal, but the moose may travel a considerable distance and a hunter's chances of recovering it are slim. Never take these shots deliberately. Blood from these "gut shot" wounds often contains stomach contents and appears brown or greenish. Hunters who suspect they've made such a shot should allow at least two hours before following the animal. If undisturbed, the moose will lie down, bleed internally and be unable to rise and travel further.

Do not try shots to the brain and spinal cord. These areas are small and difficult to pick out on a moose. In addition, the brain is well-protected by heavy bone on bulls. A close miss can cause nonfatal wounding.

If the animal's body is obstructed from view, do not use the head position to guess where the target area may be. And all hunters should avoid running shots. Archers should even avoid shooting at a moose that is walking quickly.

AFTER THE SHOT

Moose often give little or no indication that they have been hit. Unlike deer, moose

may stand in one place until collapsing or move off and bed down. If the moose moves off, wait 30 minutes before following it to allow time for the animal to bed down. Moose have heavy hair which absorbs blood from the wound, so following a blood trail may be difficult. Always assume you've made a hit and make every effort to recover the animal.

Field Dressing and Care of Meat

The challenges of moose hunting do not stop once you have bagged the animal. In any but the easiest situations, field dressing and care of the moose is a major task. The carcass may be up to five times larger than a deer. The weather will be warmer and wetter than during November deer hunts. And the terrain over which the moose must be moved is especially difficult.

However, hunters are ethically and legally bound to ensure the meat of a game animal is not wasted. Having the proper equipment and a basic knowledge of meat handling techniques will help you get the meat to the dining table in good condition.

ESSENTIAL REQUIREMENTS

1) Cool meat quickly and age properly.

Temperatures during moose season have a direct bearing on what must be done to preserve the meat. In late September to mid-October the **average minimum** temperatures are 32°–40° and the **average maximum**

temperatures are 54°–64° across the Minnesota moose range. This is warm weather, so you must take extra precautions to ensure the meat stays cool.

To produce tender, tasty meat, the carcass should first be cooled to under 40° as soon as possible after the animal is killed. In a commercial cooling room at 38° it will take at least 24 hours for a freshly killed and skinned quarter of moose to reach the room's temperature. Any situation with warmer temperatures will approach this cooling rate only if you reduce the size of the individual meat masses. Unless it is a calf moose, you need to also age the meat to make it tender. Normally, an older animal should be aged from 7 to 14 days at 36°–38° in a cooling room. The aging process begins as soon as an animal is killed. At temperatures higher than 36°–38° meat will age faster. Above 40° it can be expected to age as much in 2–3 days as it would in a week in a commercial cooling room.

Because of the speed at which spoilage can take place at body temperature, a moose should be dressed out immediately after it is killed—even in winter temperatures. Once that has been done and you are within an hour or two of a commercial meat processor, you might do no more than haul your moose in one piece to that establishment. However, most moose hunters will not be able to get their moose into a cooling room in much less than 36 hours after killing the animal. Moose

taken in the canoe country can easily be 72 hours away from refrigeration.

It is absolutely essential to skin the moose the same day it is killed. Moose hide and hair are excellent insulators that will prevent proper cooling. Therefore, any moose that cannot be placed in a commercial cool room the same day it is killed should be skinned within a few hours. Skinning will also reduce the weight to be transported by 60 to 90 pounds, unless you wish to save the hide. Adequate cooling under normal temperatures also requires that shoulders and hams be separated from their respective quarters. Any moose that cannot be refrigerated the same day it is killed should be divided into pieces as described beginning on page 23.

The skinned and divided pieces of meat need protection from dirt and flies. However, cooling should be accomplished before the meat is closely wrapped or confined in a boat, plane, or vehicle. It should be hung in the shade with good air circulation. It would be best for a moose shot and cut up one day to be cooled overnight before transportation to the registration station begins. Cloth meat sacks or cheesecloth (see equipment section, page 21) are recommended for covering the meat (30 yards of cheesecloth required for good coverage). Never stack pieces of meat before chilling to below 40°. Never use plastic for covering meat except when placing in a freezer or as a very loose, ventilated cover for

rain protection.

Plan to have your moose meat in refrigeration within 3–4 days if nights are above 45°. If daytime temperatures are in the 60°–70° range the moose should be fully butchered and frozen within three days.

To avoid last-minute problems, make arrangements with a meat processor before you leave home for your moose hunt.

2) Prevent dampness by keeping meat dry.

Meat will sour faster if it gets wet and is allowed to remain wet. The following suggestions will help you avoid that problem. The meat and the bags that contain it must be kept off damp ground. Cut brush (do not cut trees) to lay meat on while butchering and cooling near campsites in the Superior National Forest. When meat bags must be transferred during transportation, place them only on dry surfaces such as rocks, logs, or your other equipment. Air circulation around each piece of meat must be maintained throughout the transportation to refrigeration.

Sometimes getting the meat wet is unavoidable, as when washing off contaminated pieces, when it is raining while you cut up the carcass, or if your moose falls in water. Whenever meat gets wet, dry it off as soon as possible. Keep meat dry during rain by putting it under cover such as a tent or a tarp. Plan to have material of some sort along for wiping the meat dry.

Do not try to keep meat dry by wrapping

with plastic or other waterproof material. Moisture from within the meat itself will collect under the plastic. Any waterproof covering must allow full air circulation.

If you are traveling by canoe you will need some way to keep your meat sacks off the bottom and some kind of canoe cover in case of rain.

3) Keep the meat clean and untainted.

The moose hunting season coincides fairly well with the moose breeding season. During this time a bull moose digs wallows in which he urinates and sprawls. The odor of an active wallow can be detected from as far as several hundred feet. Therefore, if you do not skin your moose at once you should be careful that the hair does not touch meat surfaces. Also, do not use cloth that has covered unskinned parts of a moose to cover skinned meat.

When dressing out your moose, separate the windpipe and esophagus by running a knife between them and then tie a knot in the esophagus to keep stomach juices from flowing out.

Take care not to puncture the stomach or intestines. If you do, or if the moose has been gut-shot, wash out the body cavity after dressing and wipe it dry.

The anus should be cut free from the body and tied to prevent intestinal contents from spilling out. Search for the bladder and tie it off with a string to prevent spilling urine. If these precautions fail, clean soiled areas at

once. Blood clots and damaged meat should be removed right after quartering to prevent premature spoilage of the good meat.

Take care to cover the meat or place it in a vehicle so that dirt and exhaust fumes are excluded while providing plenty of ventilation. Never stack pieces of meat before chilling below 40°F.

4) Keep flies off meat

Flies are active during the day throughout autumn. Fly eggs can develop rapidly and spoil the meat. The process of dressing out, skinning, and quartering or further division for backpacking or canoe portages can take many hours, and on a mild sunny day, flies will soon arrive.

At this stage of handling, it is difficult to cover the meat with cheesecloth or meat sacks. Liberally sprinkling the moose with black pepper keeps flies away, but it covers up the hair and can damage the meat. A wash of white vinegar will discourage flies and not harm the moose meat. The problem with vinegar is that a gallon weighs more than 8 pounds. Enough pepper to keep flies away weighs just a pound.

While meat is hung or transported during the day it should be covered to keep flies off. Cheesecloth (about 30 yards per moose), old sheets, or special meat sacks will work. This covering around the meat should be closed to keep flies from crawling in, but it should be as loose as possible to let air circulate to cool and

dry the carcass. A fly-proof tent covering works well for this.

During the night when flies are inactive, the covering should be removed to allow better air circulation and chilling. Do not reuse any cloth for covering meat if it has been covering hair. Flies will deposit eggs where blood soaks through a covering, so beware of reusing the other side of such cloth. Cheese-cloth is too fragile for re-use to be practical—if you use it, leave it on.

EQUIPMENT

Minnesota moose are bagged in locations ranging from farm fields to remote wilderness. Regardless of the location, field dressing and moving a moose is rarely easy. Therefore, the equipment recommendations are essentially the same regardless of where you hunt. A party of four hunters should carry the following equipment:

Pack frames—Preferably the “freighter” type with a load shelf, these are the best way to move 500 pounds of moose meat from the field. Even if you plan to use an All Terrain Vehicle (ATV) to haul the animal, remember that the location where the moose is downed may be accessible only by foot. Soft packs are unsuitable for carrying large chunks of moose meat, because heavy loads are difficult to balance and carry.

Nylon rope—This is used to lash the meat

to a pack frame or other carrier, and to hold the moose in position when you field dress it. Carry at least 200 feet of ¼- or ⅜-inch-diameter rope.

Meat sacks—Sacks are used to keep insects, dirt, and debris off the meat. You can buy inexpensive meat sacks from sporting goods retailers or make your own from muslin or cheese cloth. The sacks should be about 30 inches wide and 40 inches long. You will need at least eight sacks.

Plastic trash bags—Use 39-gallon bags to cover moose meat when transporting it in the rain or to carry the liver, heart, and kidneys. Meat can spoil when contained in plastic, so be sure to keep the bags open and remove them immediately when they are not needed. Because these sacks tear easily, bring a good supply.

Tarps—Use two lightweight, coated nylon tarps, 10 foot by 10 foot in size, to cover meat in camp. Place the quarters on the tarp when field-dressing the moose.

Block and Tackle—A small block and tackle may be needed to move the downed moose to a place where you can field-dress it. Two lightweight sets generally work better than one heavy set.

Pepper—Sprinkle a quarter-pound of black pepper or several cups of vinegar on the meat as a fly repellent.

Saws—Carry at least two bone saws,

preferably one each of the bow and sabre types. Be sure the saws are sharp before leaving on the hunt. Bringing spare saw blades is a good idea. Some hunters use a chain saw to field dress moose, but the result is messy and you may taint the meat with oil and exhaust.

Knives—Heavy butcher knives work best for separating joints or cutting through large masses of muscle. Butcher knives should have a 5- or 6-inch blade. Carry at least two, so you can work with one while the other is being sharpened. You can also use butcher knives to clear brush in your working area.

Skinning knives are necessary to take off the hide. Bring at least two. Moose hide is much thicker than that of a deer and can quickly dull a knife.

Sharpeners—Knife sharpeners allow you to touch up your knives as you work. Diamond sharpeners work with water rather than oil, making them somewhat easier to use in the field.

Lights—Flashlights, headlamps, and camp lanterns are needed if you shoot a moose in the late afternoon, because it will be after dark before you finish field dressing the animal. Bring a sufficient supply of batteries and lantern fuel.

Waders—Hip boots or chest waders may be necessary if you shoot your moose in a marshy area. Try to avoid shooting a moose that is standing in water.

Cloth—Wiping cloths are needed to remove water, debris, and blood from moose meat, you, and your equipment. Use cloths that are absorbent, and can be rinsed and wrung out.

Ice—Use large ice chests to store the meat when you travel home after the hunt. An entire, boned-out moose will require four to six ice chests.

Packs—Wear small day packs to carry field-dressing equipment, food, water, and extra clothing. For deer hunters who are accustomed to carrying little more than a gun, knife, and rope, this may seem excessive. However, not having the above items on hand when you need them will greatly increase the difficulty of field-dressing a moose.

Salt—Use non-iodized salt to preserve the moose head for mounting and the hide for tanning. You will need about six pounds to salt down the head and cape. To preserve the entire hide you will need an additional 12–15 pounds. The salt supply can remain at your vehicle.

Step-by-Step Field Care

Step 1. Notify the other hunters in your party using a pre-arranged signal. Carefully approach the downed moose. If the animal is dead, most likely the eyes will be open and glazed. While standing clear to avoid being kicked, prod the moose with a stick. If the animal is still alive, finish it with a shot to the head, neck, or heart. If the eyes do not glaze over within a couple of minutes, shoot the moose again. Do not shoot it in the head if you are planning to have the head mounted.

Step 2. Make sure to tag your moose before you move it from the site. Prepare the site for field dressing. Clear away any brush which may interfere with your work. If the area is swampy, you may have to move the moose to dry ground before you begin.

Step 3. Because of its thick hide and large size, a moose cools slowly. Even with chilly fall temperatures, it takes nearly two days for a moose carcass to completely cool. Don't delay the cooling process by wasting time before starting to field dress the moose. Get to work! Even with four hunters, it takes several hours to complete the task.

Step 4. Roll the moose on its back. If possible, get the front quarters higher than the

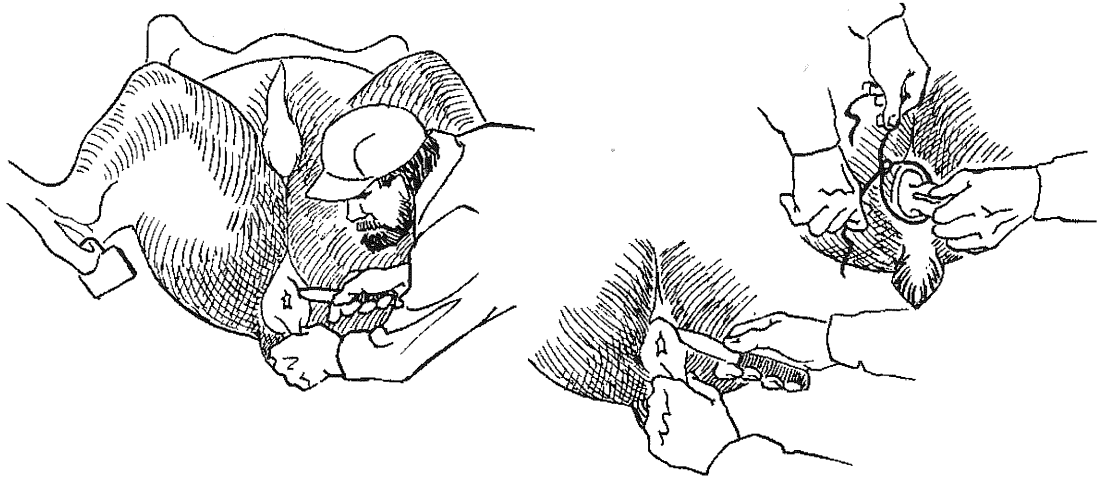


Figure 2. Cut around the anus and colon, and tie the anus off with a string.

rest of the carcass, which will make it easier to remove internal organs. Use rope to tie off the legs to nearby trees in order to steady the carcass. If you are alone, roll the animal on its right side. The attachment of the paunch is on the left side of the body cavity, so it is easier to remove if you can reach it without probing under the entire weight of the paunch.

Step 5. Begin opening up the moose by cutting around the anus and colon, freeing them from the tissues and bone that surround them (Figure 2). A long-bladed knife is best for this job. Tie the anus off with a string, so the droppings won't spill on the meat. Once you've cut around the anus, you can free most of the colon by pushing your hand along and around it.

Step 6. Have an assistant hold one hind leg or tie the leg back so you can make the main incision. Beginning between the hind legs, cut through the skin and thin muscles that cover the abdominal cavity. Use your knife with the cutting edge up to avoid puncturing internal organs (Figure 3). Take special care not to puncture the paunch. Pressing down on the rumen with one hand while you cut will help prevent accidental puncture. Continue cutting forward to the breastbone. Cut through the breastbone using a saw and continue the cut to the base of the neck. You have now exposed the entire body cavity (Figure 4).

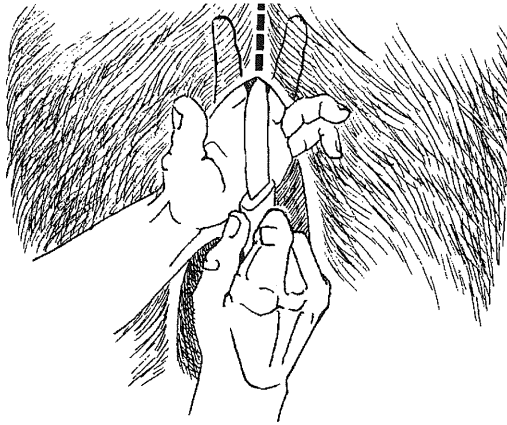


Figure 3. To avoid puncturing internal organs, hold your knife with the cutting edge up while pressing down on the rumen with your other hand.

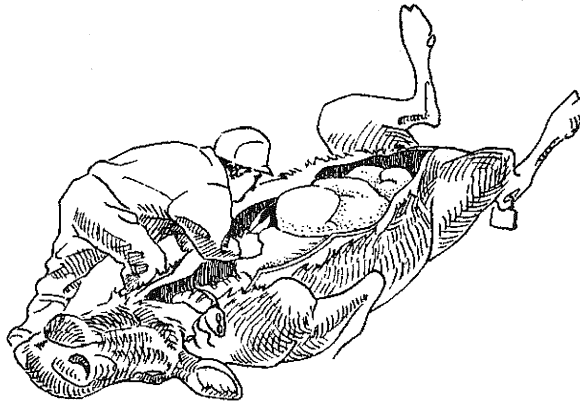


Figure 4. Using a hand saw, cut through the breast bone and continue the incision to the base of the neck.



Figure 5. Cut around the diaphragm where it attaches to the breast bone.

Step 7. Cut completely around the diaphragm where it attaches to the rib cage and breast bone (Figure 5). Pry open the rib cage by either tying one front leg to the side or having an assistant pull the front legs apart. Cut off the esophagus and windpipe at the neck and tie them off (Figure 6).

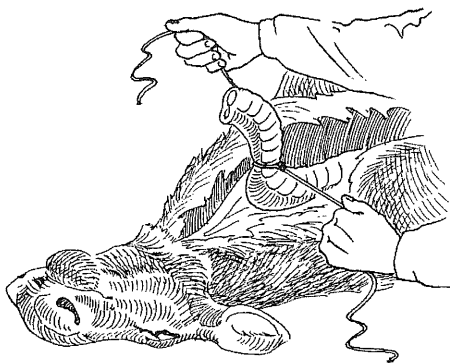


Figure 6. Cut off the esophagus and windpipe at the neck, and tie them off with string.

Step 8. By pulling back on the windpipe and esophagus you can remove the heart, lungs, liver, and finally the paunch, intestines, and kidneys. The colon and anus can be pulled through from the inside. Very little cutting is necessary once you begin pulling the organs out. Be careful not to cut the tenderloins along the backbone when freeing the paunch and intestines. Set aside the heart and liver, allowing them to cool as quickly as possible. See page 29 for recommendations on eating internal organs. Prop the carcass so that blood drains from the body cavity. Open the cavity using a stick to promote cooling.

Step 9. Now you must decide whether to: a) haul your moose intact; b) quarter the moose without skinning; c) skin the moose and quarter it; or d) skin the moose and cut it into pieces smaller than quarters. Carefully consider which option will make it easiest to haul the meat without undue strain to the hunters or risking spoilage. The following suggestions should help you decide.

a) Haul your moose out whole only if you can go to a commercial cool room on the same day the moose is killed and if you can drive to the moose with the transport vehicle and a mechanical loader.

b) Quarter your moose without skinning only if there is time to get the moose quarters to a cool room on the same day, but there is no mechanical loader. You will probably be able to drag the quarters to a vehicle if the terrain is

gentle and the distance is no greater than one-half mile.

c) Skin and quarter your moose if it will be the next day before you can reach a cool room. Skinning also allows you to save the hide.

d) It is necessary to skin the moose and cut it into pieces smaller than quarters whenever: temperatures do not fall to 40° at night or rise above 55° during the day; it will take two days or more to reach a cool room; or the meat must be backpacked.

Step 10. Remove the legs and head. If you wish to make a head or antler mount, see page 29 for further information about care of trophies. It is best to separate the head and neck at the point where the neck joins the body. Cut through all the hide and muscles to reach the spine, then disjoin the neck by cutting with a bone saw. Now cut through the hide on the top of the neck to a point between the antlers. Next use the cut to skin out the neck. Then cut through the neck muscles where the skull and vertebrae join and cut the head and neck apart with a bone saw. The neck section averages 40 pounds and is used for hamburger and stew meat.

The lower legs can be removed with just a heavy knife, if you can locate the joints. Look for them low on the knee bend and just below the hock joint. Do not cut the hock tendon, because it is handy for hanging the quarters and is one of the places where your moose tag can be attached. After you cut through the

hide and ligaments at the joint, it will separate if you exert enough pressure. You may find it easier to wait until the moose is quartered and skinned before removing the lower legs.

Step 11. Skinning before quartering is usually preferable, because it lowers the risk of spoilage. Also, skinning is easier when the animal is still warm and fresh. However, if you decide not to skin your moose before quartering, continue to Step 12.

Begin skinning by make a cut through the hide along the inside of each leg from where the lower legs were removed to the body cavity incisions (Figure 7). Cut from inside the hide, which will keep your knife sharper and the meat cleaner than cutting through the hair from the outside. The hide will easily pull away from the body, and you can use a curved blade skinning knife to free it where it

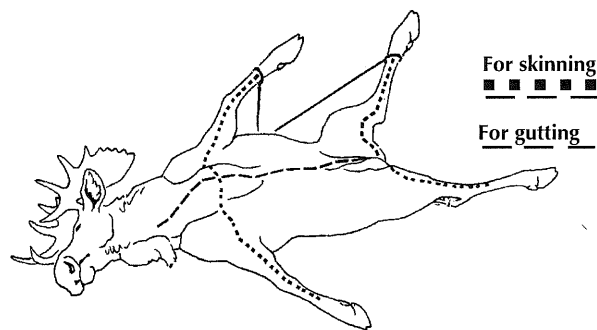


Figure 7. Location of cuts to beginning skinning and gutting

sticks. Skin out the legs and both sides as much as possible, then roll the animal on one side to skin along the back. Roll the animal the other way, lying the carcass on the skin side of the hide, to complete the skinning. You will know have the carcass lying on the spread-out hide, which provides you with a clean working area.

Step 12. The procedure for quartering a moose is the same whether the hide is on or removed from the carcass. However, cutting is more difficult and messy if the hide is left on. If you decide to cut the meat into smaller pieces to facilitate cooling, skip this step and proceed to Step 13, because the cuts are different.

To begin quartering, cut the moose in half (crosswise) just behind the last rib. Stand the front half neck end up and saw down the center of the backbone to separate the two front quarters. To separate the hind quarters, saw through the pelvis first. Then stand the back half on the rump and saw down through the backbone. You now have four quarters and the neck piece (Figure 8).

Step 13. This step begins with the moose gutted, skinned, and lying on the hide. The average moose carcass will weigh about 400–500 pounds, but it can be moved quite easily on the hide. Pull the carcass to one side of the hide so you don't have to stand on the hide. Two hunters can hold the carcass steady while a third pulls a front leg away from the body so

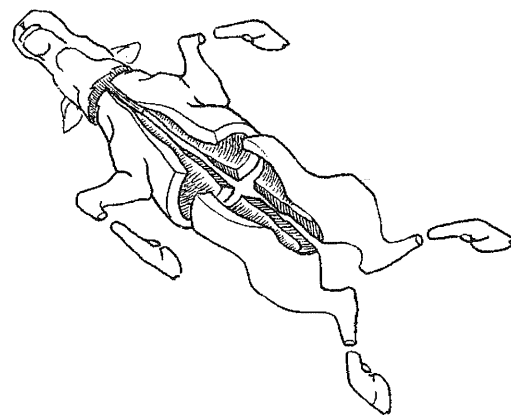


Figure 8. Location of cuts for quartering.

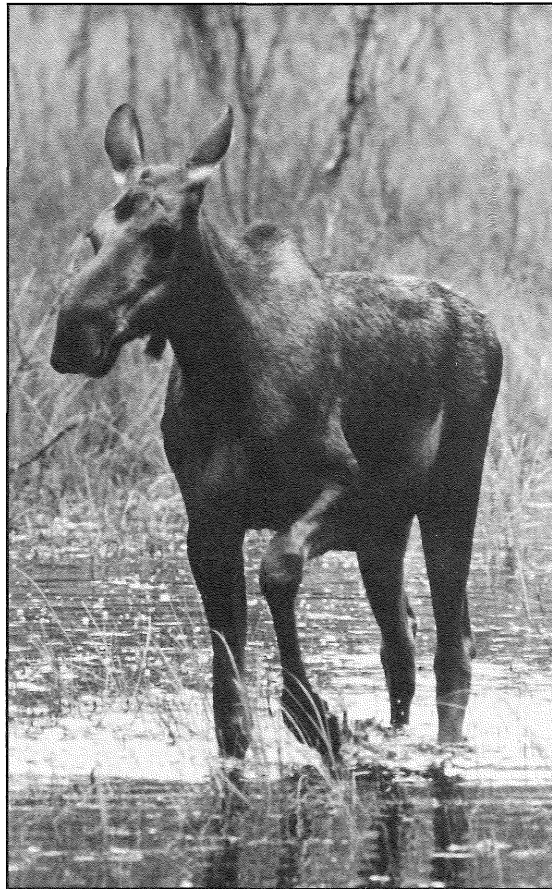
the fourth hunter can remove it with a cut between the leg and the chest. Continue cutting to remove the leg with the shoulder blade attached. Repeat the procedure on the other front leg. Each leg will weigh about 40–50 pounds.

The most effective way to cut the hams free of the pelvis is to locate the ball and socket joint by moving the leg. This joint separates quite easily once the muscles are cut. The hams will generally be somewhat lighter than the front quarters.

Boning out the ribs is the preferred method. First, cut away the flesh from the ribs all the way to the backbone on both sides. Try to keep the meat in one piece, rather than cutting off small pieces. Then score the joints between the ribs and backbone with your heavy knife and bend the ribs outward to

break them free. You may instead saw them off about 6 inches from the backbone. You now have the back of the moose, with the meat cut from the ribs attached. Either bone this out or cut this section into two or three pieces to make it easier to carry. You can either saw through the backbone or use your heavy knife to separate it at the vertebral joints.

You now have eight or nine pieces of moose meat, each weighing from 40–70 pounds. This represents about 60 percent of the animal's total weight. By further boning out the meat, you can remove an additional 50–75 pounds of bone. This is an important consideration if you must pack across several portages or plan to carry out a trophy head.



Leonard Lee Rue III

An adult cow weighs 900–1,000 pounds. When field dressed, it weighs 400–600 pounds.

INTERNAL ORGANS AND OTHER EDIBLE PARTS

Heart

On the moose heart, you may find cysts, which come from a life stage of tapeworm which infects the intestines of canines such as dogs and wolves. The cysts appear as small whitish balls the size of a pea. They may be filled with a clear fluid or be calcified and have a yellow color. No stage of the tapeworm infects humans, but the cysts should be sliced out. If there is a heavy infection of cysts, the heart may be inedible. Approximately two percent of the moose taken in northwestern Minnesota and approximately 17 percent taken in northeastern Minnesota are infected with heart cysts.

Liver

The giant liver fluke is a leechlike parasite that can cause extensive liver damage. About 51 percent of moose livers from northwestern Minnesota and 15 percent from the northeast are infected with flukes. You can find liver flukes by slicing through the liver. You may see either live flukes or pockets of blackish matter within light-colored pockets of tissue. Do not discard a liver because of

color alone. A wholesome liver may vary in color from sandy to blackish red.

Moose livers sometimes carry the larval stage of a parasitic worm found in both the dog and cat families. These cysts are usually less than one-half inch in diameter and are filled with a clear fluid surrounding the larva. If there are only a few cysts they may be cut out with no harm to the liver. The cysts have been found in 24 percent of samples from the northwest and in 38 percent from the northeast.

Note: Normal cooking procedures will kill any parasites.

Caution: Do not feed any raw, wild animal organs to your pets. Parasites are as infectious to dogs as they are to wild carnivores, their usual hosts. Also, the eggs of a deer or moose lung parasite passed through a dog can infect humans.

Other Edible Parts

Other edible parts not commonly consumed are the muzzle, tongue, kidneys, and testicles. Of this group, boiled moose tongue is especially delicious. The tongue can be removed most easily from the underside of the jaw. If you plan to have the head mounted, remove the tongue after the head has been skinned. Otherwise, cut open the underside of

the jaw and cut the tongue free from its connections. Prepare as beef tongue.

CARE OF TROPHIES

If you plan to have your moose head mounted, consult a taxidermist before the hunt for recommendations about caring for your trophy in the field. Figure 9 shows where to make the cuts to skin out the cape. You may wish to save just the antlers and mount them

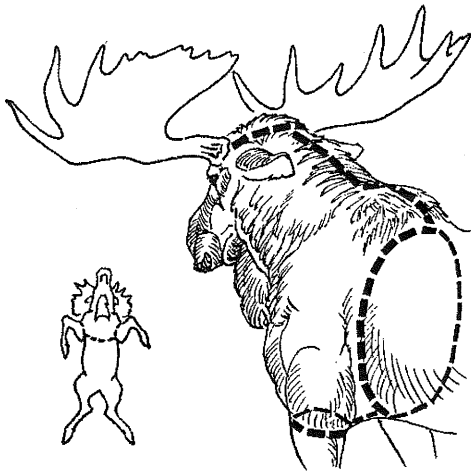


Figure 9. Approximate location of cuts to skin out the cape of a moose for a trophy.

on a plaque. Moose hides may be tanned and made into leather products.

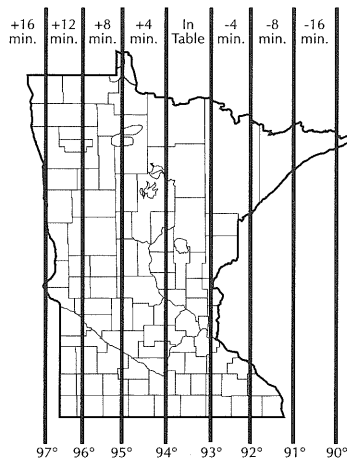
BUTCHERING AND PREPARATION

If you plan to have your moose meat commercially butchered, make arrangements with your butcher before the hunt. Butchering a moose yourself is a lengthy, but rewarding task. Whatever route you choose, make sure the meat is wrapped in airtight packages to prevent freezer burn and marked with the date and cut of meat.

Moose meat generally has less fat content than beef. Many cooks prefer to add extra fat or liquid when preparing moose meat, or to use a marinade to moisten of the meat. Slow-cooking recipes retain moisture and tenderize the meat. Properly prepared moose meat has exceptional table qualities. Enjoy this flavorful reward of your hunt!

Sunrise/Sunset Table

Nine hunting time zones are shown on the map below. Sunrise and sunset times to be used for hunting purposes in the zone titled "In Table" are shown in the table to the right. To determine times for other zones, add or subtract, as appropriate, the minutes shown at the top of the map to the times shown in the table. Times shown are Central Daylight Saving Time through October 30, 1993 and Central Standard Time thereafter.



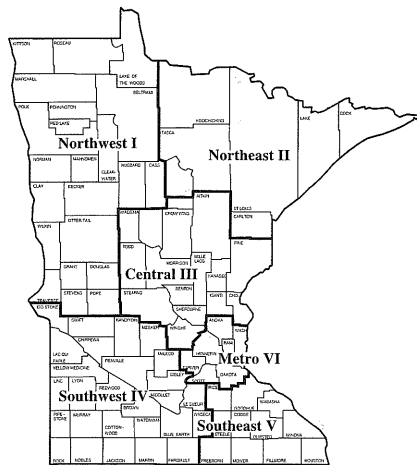
Time Zone

DAY	OCT.		NOV.		DEC.	
	Rise AM	Set PM	Rise AM	Set PM	Rise AM	Set PM
1	7:11	6:54	6:51	5:02	7:31	4:33
2	7:12	6:52	6:53	5:00	7:32	4:33
3	7:13	6:51	6:54	4:59	7:33	4:33
4	7:14	6:49	6:55	4:58	7:34	4:32
5	7:16	6:47	6:57	4:56	7:35	4:32
6	7:17	6:45	6:58	4:55	7:36	4:32
7	7:18	6:43	6:59	4:54	7:37	4:32
8	7:19	6:41	7:01	4:53	7:38	4:32
9	7:21	6:40	7:02	4:51	7:39	4:32
10	7:22	6:38	7:04	4:50	7:40	4:32
11	7:23	6:36	7:05	4:49	7:41	4:32
12	7:25	6:34	7:06	4:48	7:42	4:32
13	7:26	6:32	7:08	4:47	7:43	4:32
14	7:27	6:31	7:09	4:46	7:44	4:32
15	7:28	6:29	7:10	4:45	7:44	4:32
16	7:30	6:27	7:12	4:44	7:45	4:32
17	7:31	6:25	7:13	4:43	7:46	4:33
18	7:32	6:24	7:14	4:42	7:46	4:33
19	7:34	6:22	7:16	4:41	7:47	4:33
20	7:35	6:20	7:17	4:40	7:48	4:34
21	7:36	6:19	7:18	4:39	7:48	4:34
22	7:38	6:17	7:20	4:39	7:49	4:35
23	7:39	6:16	7:21	4:38	7:49	4:35
24	7:40	6:14	7:22	4:37	7:50	4:36
25	7:42	6:12	7:24	4:36	7:50	4:37
26	7:43	6:11	7:25	4:36	7:50	4:37
27	7:44	6:09	7:26	4:35	7:51	4:38
28	7:46	6:08	7:27	4:35	7:51	4:39
29	7:47	6:06	7:28	4:34	7:51	4:39
30	7:48	6:05	7:30	4:34	7:51	4:40
31	6:50	5:03			7:51	4:41

NORTHWEST REGION 1
2115 Birchmont Beach Rd. NE
Bemidji, MN 56601
(218) 755-3958

NORTHEAST REGION 2
1201 E. Highway 2
Grand Rapids, MN 55744
(218)327-4413

CENTRAL REGION 3
1601 Minnesota Drive
Brainerd, MN 56401
(218) 828-2615



SOUTHWEST REGION 4
Box 756, Highway 15 South
New Ulm, MN 56073
(507) 359-6000

SOUTHEAST REGION 5
2300 Silver Creek Road NE
Rochester, MN 55901
(507) 285-7435

METRO REGION 6
1200 Warner Road
St. Paul, MN 55016
(612) 772-7942



Department of Natural Resources
500 Lafayette Road
St. Paul, MN 55155-4040

© Copyright 1993, State of Minnesota,
Department of Natural Resources

Equal opportunity to participate in and benefit from programs of the Minnesota Department of Natural Resources is available to all individuals regardless of race, color, creed, religion, national origin, sex, marital status, status with regard to public assistance, age or disability. Discrimination inquiries should be sent to MN-DNR, 500 Lafayette Road, St. Paul, MN 55155-4031; or the Equal Opportunity Office, Department of the Interior, Washington, D.C. 20240.



This paper contains a minimum of 10% post-consumer waste.

This information is available in an alternative format upon request.

