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Moose

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Moose are widespread throughout the majority of the boreal regions of North America and were a very important food source for many cultures. Slavey, Sahtu or Hare harvested moose in lowland or riverine regions [28, 116]. Moose were found in the forests inhabited by the Woodland Cree and Chipewyan, and also in the mountainous zone of the Yukon First Nation in the interior regions of Alaska [66, 67]. In the Beaver First Nation region, moose are found in the timber regions near the Tahltan region in the willow region of the Teslin River, along the Tuya River headwaters, and the Taku River [128]; for the Chipewyan in wooded areas of the Mackenzie River district [123, 130]. Moose are plentiful in the thin northern areas of the Anishnabeg (Anishinabek) Ojibway, the Plains Ojibwa (Bungi) Turtle Mountain Band (Chippewyan), Assiniboine, Rapid Indians, Blackfeet, and the Cree [104, 107]. In Gwich'in regions, moose occur in specific regions: upper Porcupine River, especially at its junction with Johnson Creek, along the swamps and lakes north of the Porcupine below Old Crow Village and east of the lower Bluefish River [112]. In the Tsimshian region, moose occur near the coast in autumn. In the Nuuksut region, during June - September moose travel north along the upper Colville and Skeena [127, 145]. In the Shuswap region of British Columbia, "moose were found only in the extreme northeast hunting areas. Moose were reported to be abundant in the Saskatchewan River delta of the Red Earth Cree of Saskatchewan and in the northern areas [68, 139]. Moose are found in the forests near the Western Abenaki, Montagnais-Naskapi (Innu) north of the Saguenay River and in the Lake St. John region [87, 88]. In the late 1700s and early 1800s, moose were found in the foothills and prairies east of the Rockies, where they were hunted by Sekani [33]. In the Alaska Plateau area, moose were hunted by Tanana and other Athapaskan peoples at lower elevations and in valley lowlands where young vegetation was abundant [39, 41].

Hunting

Moose are usually hunted in late summer and early fall (rutting time), and/or late winter and early spring [4, 6, 7, 25, 27, 35, 37, 38, 41, 42, 44, 45, 51-55, 59, 62, 71, 79, 82, 84, 91, 105, 107, 108, 110, 116, 121-123, 127, 133, 137-141, 143].

Many cultures are reported to travel, sometimes long distances, to hunt moose [6, 12, 16, 17, 19, 25, 35, 38, 42, 52, 134, 137, 139, 145]. Travel by boat and camping in hunting areas is common [10, 27, 35, 38, 52, 54, 55, 127, 133, 139]. Many cultures typically harvest moose while participating in other activities such as trapping; however, specific moose hunting may be organized [25]. Women may accompany men during the hunt in order to skin and slice the meat [145]. The Montagnais-Naskapi hunt moose in winter, are reported to move seasonally from the coast when winter arrives to specific hunting districts primarily inland to the lakes and forests to hunt moose, often with family hunting groups of ten to fifteen people.

The Algonquian and Iroquoian were reported to hunt moose on hunting territories owned by each family or band. Kootenay and Tlingit hunt on expeditions with family units or the entire community (men, women and children) [148].

Moose can be hunted by individual hunters, in small teams of two or three, or in big groups [6-8, 12, 22, 27, 51, 9, 137]. The Malecite are reported to drive moose into rivers, presumably using drive hunting, a technique that involves people [8].

Moose hunting has typically been a male endeavour, although among the Chipewyan, both men and women participate. Mistissini Cree women also hunt moose [6, 7, 22, 25, 27, 71, 84, 116, 124, 133, 145]. Every Kootenay man, it is reported to have participated in the moose hunt [12].

Hunting techniques

Snares, moose calls, semicircular tracking, corrals, clubs, spears, bows and arrows, knives, in later times guns, or any of these methods and tools have been reported to be used to hunt moose [24, 30, 36, 41, 44, 90, 102, 105, 123, 146]. Moose hunting methods are adapted to moose behaviour as moose do not congregate in large numbers. During the summer they are usually solitary. However, during winter period of deep snow accumulation, moose may congregate in small sites [140]. Since moose tend to stay in one region at some times of the year, each feeding within a home range of 100 square miles, they can be stalked and slaughtered by a solo hunter [94]. Moose hunting on foot and/or canoe can be divided into two categories based on the hunting method utilized, either extensive or intensive. In the extensive method, hunters cover a huge region to increase the likelihood of encountering moose. Hunters use their accumulated knowledge of the moose's habits when deciding where and when to hunt (e.g. moose usually visit lakes and swamps in the summer to consume water lilies to evade insects; they also swim across water in summer, particularly in narrows between island and mainland) [140]. When a moose on shore or in the water is identified, it is shot with a rifle. If a moose is in the water, it may be coerced or killed, as it is difficult to pull the large animal from the water. The intensive moose hunting method involves targeting specific areas and particular moose using semicircular tracking, taking advantage of the moose habit of slightly doubling back in order to get wind of any predator following it [7, 121]. To circumvent the moose catching his scent, the hunter follows a moose track is on its leeward side [121]. When the moose track reverses, it shows that the moose had paused to rest. The hunter cautiously approaches to slaughter it. With this method, it is easier to hunt in very windy conditions and wind sounds are rustling so the moose cannot hear the hunter approaching [7]. The actions of a bull moose are different from those of a cow with a calf, in that a bull moose moves quickly and deliberately, sometimes running long distances through the brush before resting. A cow moose with a calf does not traverse such a huge area, but remains in a comparatively restricted area for a few days. As a result, one of the key strategies for intensive hunting of a cow moose with a calf is to set an ambush near the moose's feeding area [121].

Semicircular tracking has been performed by the Chipewyan, Slavey, Sahtu, Hare, Yukon Flats and Peel River Kutchin, Montagnais of the St. Lawrence River, Athapaskan, Cree of Hudson Bay, Ojibwa Plains Turtle Mountain Band, Mistissini, James Bay Cree, Dogrib, Upper Liard Kaska and Dease River Kaska, Han, Beaver and Tanaina [7, 15, 20, 25, 27, 38, 71, 121, 130, 133, 135, 138, 140]. Semicircular tracking can be done by a single hunter or by a team of two [116]. Once a moose was typically killed with bow and arrow, spear, and in later years, gun [7, 15, 25, 27, 38, 71, 130, 133, 140]. Sahtu are reported to slaughter with bow and arrow, aiming behind the shoulder of the animal. [116]. Dogs are also used to hunt moose [38].

Up until the late 1800s, bows and arrows were used by the Sahtu to hunt moose. The bow was made of dry-willow and while the arrow was made of hard spruce with the head made of caribou bone, moose bone or loon's beak. In later years, moose were shot with rifles [27].

Snares or natural obstacles are reported to be commonly used to hunt moose. The Chalkyitsik Kutchin, Peel River Kutchin, Yukon Flats Kutchin, Chipewyan, Fort Nelson Slavey, Slavey, Shuswap, Tutchone, Tsimshian, Ahtna, Han, Mount Kaska, Dogrib, Abitibi, and Kootenay used snares or natural obstacles to trap moose [6, 7, 12, 25, 30, 31, 36, 38, 44, 116, 123, 126, 133, 145]. The Tutchone are known to have hunted moose with snares located along trails or in hollows or corrals [36]; a snare 3 or 4 feet wide could be attached to a large tree on one side, and to two support snares connected to a smaller tree [126]. The Kutchin hunted moose with snares by lakes where moose licked salt piles or ate grass [7]. Snares are positioned between fences made of willows on moose trails or runs, and the moose driven into natural holding areas or ravines [133].

The Kootenay are reported to have used drive hunting to kill moose. A specific area was located where the moose was steered to, such as an area flanked by two mountains or hills, and at times, a barrier that they had created between the mountains. Men drove the moose towards the barrier, and women, children and elderly men positioned themselves to drive the moose into the enclosed space where it was slaughtered. [12]. The Abitibi are also reported to have used drive hunting. Men drove the moose into a pen made of poles forced into the ground, where it was easier to kill [102]. The Montagnais are reported to drive moose many miles before it was slaughtered so that the carcass would be in a convenient location.

transportation [137]. The Dease River Kaska also used human surrounds when catching moose: a circle of men c towards areas where snares are placed. The Tselona Kaska set snares in the summer, and at times, a line of men the same time to drive a moose toward a sequence of snares [84].

The Ingalik, Waswanipi, Slavey, Chipewyan, Malecite, Cree, Yukon and Northwest Territories First Nations, Athap Alaskan Plateau, Mistissini Cree, Koyukon/Tanana River Peoples, Hare and Chalkyitsik Kutchin of Alaska practice hunting [6, 8, 27, 31, 39, 42, 71, 91, 95, 105, 122, 139]. In many regions in summer, to escape the mosquitos, moos lakes, marshes, rivers and open sandbars [6, 39, 105, 122, 139]. They can be killed when swimming or browsing [4

The Chalkyitsik Kutchin of Alaska hunt moose in rivers in the fall. The hunt entails a great deal of travel and prep village before heading to moose country, which is several days' boat, ride up the Black River. Often, the owner o motor decides when he would like to go moose hunting and through word of mouth and discussion with family friends, interested parties approach the hunter for his itinerary and ask if they could accompany him. The plans are made several days in advance, but are always weather-dependent. The gear carried by each individual is usu: shooting moose, a shotgun to kill ducks encountered along the ride, a moose scapula to attract the male moose, for axes and knives, sleeping bag, ground cloth and matches and a food box consisting of utensils, a teapot or ke Communal equipment consists of sundry items including a tent, candles, lantern, tarps, axes and perhaps an ext engine. Because boat travel is cold even when the climate is warm, hunters often wear winter clothes including v pants, long underclothing, heavy socks, flannel or wool shirt, waterproof leather or rubber boots, a warm cloth j heavy cloth parka, which is typically a winter jacket. At dusk or dawn, coveralls or heavy cloth pants can also be v

Deep snow facilitates hunting moose, because hunters wearing snowshoes and/or travelling by dog sled can cov with less effort. The Athapaskan First Nations and the Montagnais of the St. Lawrence River found moose was ea when the deep snows of late winter arrived, and they slaughtered it with spears [15, 140]. In earlier times, in very Peel River Kutchin, Kaska and Fort Nelson hunters removed their moccasins so as to make less noise when track

On snowshoes and/or by dogsled, the Chipewyan hunter uses the intensive hunting method (semicircular tracki "running-down" strategy (tiring out the moose in deep snow). This strategy relies on the hunter's endurance anc as the snow conditions. The best condition for this method is spring snow: the ice on the top layer injures the m walks [121, 122]. In winter, the Chipewyan also hunt moose without their snowshoes. The hunter removed his sn other times, his leggings as well, and stalked the moose, usually during heavy wind so that the moose would not l catch his scent. In spring, when the snow is heavily crusted, the Chipewyan drive the moose into snowdrifts to b [123].

In the Dogrib region, during winter, moose are slowed because their mass causes them to break through the sno hunters could pursue and overtake the moose on snowshoes [25]. After heavy snowfall, Beaver hunters on snow moose much easier, and the eastern Algonquian easily pursue the moose in the deep snow [10, 20].

The Waswanipi are able to hunt moose more easily when there is early, intense, continual snow cover [91]. They moose in January in deep snowfall by searching for moose signs and then tracking them on snowshoes. Also, a li preferred because it masks low sounds made by the hunter. The moose tires because of the deep snow and ofte Late March and early April are also good because the sun melts the top of the snow, which then freezes during c causing an icy slab to form. The moose crashes through this crust and scrapes its legs against the edges of the ice assist the hunter by cornering the moose or forming semicircles around it [59]. The West Main Cree hunt moose them down in soft snow and the Montagnais of the St. Lawrence River find moose easier to track when the deep winter arrive [15, 144].

Yukon and Northwest Territories First Nations hunters are reported to remove part of their clothes, which typic wood smoke, even in winter, and also try not to make any sound when hunting moose [105]. For the Chalkyitsik Tanana of Alaska winter hunting involves hunting in the hills and flats because at this time moose move back into flats. The first snowfall after freeze up is a good time to go north to the Porcupine River or south to some large n for groups of moose. The moose tend to remain in groups of three to five at least until mid-winter [6].

Fall is also a preferred time to hunt moose because this is moose mating season. Moose make unique sounds du and hunters can mimic them. The male moose is typically lured by imitating the sound of a female moose (cow), the sound of a male moose (bull) [6, 7, 9, 16, 20, 27, 53, 71, 84, 90, 93, 102, 105, 107, 108, 133, 139, 140, 146]. In fact, (Mi'kmaq) language, the month of September is called "moose calling" [16]. Some cultures such as the Beaver ar would rub a big bone, such as a dry shoulder blade or antler, against a tree, imitating a male moose, which cause male moose to challenge the supposed intruder in his territory. Others use rolled birch bark to imitate the bawli moose mating call to entice the opposite sex [20, 84, 105].

The Western Abenaki also hunted moose using moose calls, the Interior Salish have used hollowed-out bones to calls to lure moose, and the Dease River Kaska hunters used a birch bark horn to call moose or rubbed a moose

a tree” to lure moose [53, 84, 90]. Sahtu Hare used a dry shoulder blade from a moose to lure moose, and “in sea Tselona Kaska used a dried moose scapula to call moose [27, 84].

The Fort Nelson Slave are reported to make a moose call by rubbing a moose antler or shoulder blade across a t animal think that there was another animal in the area, or they would use a true call, in which the hunter called t up portion of birch bark to imitate a bull [133]. The Micmac also used a roll of birch bark to imitate a moose call moose within shooting reach [9]. The Shuswap hunt moose by luring them by blowing with the hollow part of cc Indian celery, *Heracleum maximum*) and the Red Earth Cree of Saskatchewan called moose to within shooting r bark cones [6, 7, 46, 102, 105, 107, 108, 139, 140, 146].

Preparation

Many First Nations butcher the moose at the slaughter site, though others butcher it when they return to camp [71, 124, 133, 137, 139, 145].

The Mistissini Cree hunter is reported to skin and butcher the moose at the slaughter site and usually return to c tokens of the slaughter in his hunting bag. In the winter, the hunter would bury the flesh and hide it in the snow (weather, with spruce branches to protect it from scavengers. Sometimes it was necessary to make a cache out o hunter to remain at the slaughter site in order to protect the meat from scavengers. The tokens returned to cam the abdominal cavity, the heart and lower intestine, and two types of fat, called wiis (the thin layer of fat located : cage), and wiikw (the thick white fat around the internal organs), in particular the kidneys. Any fetuses found we morsel of wiikw fat in their mouths during butchering, and then carried back as tokens. At times, the lower legs v brought back as tokens because they contained another highly prized kind of fat called wiin, which is found encl leg bones. This type of fat was eaten as a delicacy, and was the focus of the most important feast among the neig Naskapi. When the men returned to camp, the women unpacked the hunting bag, the tokens were displayed for admire and a meal was prepared from these tokens later that same day. The fetuses were not always consumed : they were skinned and butchered as if they were full-sized animals. Sometimes, the fetus meat was dried on raft stove, and then boiled and consumed, with everyone at the meal receiving a piece. The day after the hunter’s ret bodied individual helps to carry the moose meat back to camp and it is displayed in the hunter’s home. The heac placed facing the door (so that the animal may see how the hunter went out when he left to go hunting). The raw shared with the whole community, with the muscle meat portioned equally among all families. If one family was another private distribution occurred for this family [137].

If more than one moose were slaughtered, it was not usually possible to dress and carry the entire carcass to car the viscera and organs were removed. In winter, the carcass would be topped with snow and spruce saplings. Du seasons, only spruce saplings were placed on the carcass. The hunter would then return to camp and announce exhibiting the heart, liver, and part of the meat and then he would give some of the meat to every family in the c of the liver was consumed because it was deemed “strong” food. The men and boys in the return trip each butcl portion of the moose and it was skinned and butchered with knives and axes. The blood was not consumed, bec deemed too “strong”, but could be given to dogs. The meat was carried back on sleds and/or toboggans in the w canoe [71].

When the Sahtu slaughtered a moose, the hunter sliced off the ears and threw them into a tree for spiritual purp then skinned the moose, butchered it and carried home the intestines and skin. If it were winter, the meat would snow so that it would not freeze until returning the next day. If the hunter feared predators, he would cache it o wood [27].

The Peel River Kutchin hunter would cache the meat, usually by hanging it in a tree. If there were great need for would carry some of the flesh back to the camp. If he had a family, he would inform all people that he had slaug and then gave some meat to a respected hunter, normally a member of his wife’s clan or his own. If the hunter v he informed his father about his success and his father made a commendation speech in honor of his son in froi Later, the father distributed the meat freely [7].

The Fort Nelson First Nation hunter returned to camp with a bit of the meat, announced the kill, and his wife dis friends. A party of people, which could also include the hunter, went to collect the rest of the game, following tra hunter. The carcass was packed in rawhide packsacks, or if going by horse, wrapped in tarpaulins. Once back at t moose was distributed to each member of the community. If traveling on water, the hunter and his hunting com home the moose themselves, typically by boat. If traveling on land, he still relied on others to aid him to pack ho [133].

After taking some flesh for his immediate needs, the Han hunter cached the remainder of the meat in a tree afte went back to his village and presented the moose to a respected man in the opposite clan. This man retrieved or meat, and the meat was prepared for a feast for everyone [38]. When the Tanana slaughtered a moose, it was no:

the spot, although a good hunter killed more than he needed at the moment, and dried the excess meat [110].

Many Waswanipi Cree cached the meat they had hunted in the winter to add variation to their summer diet [59]. Han cached the dried meat in convenient spots where younger men could retrieve in winter for supplies or the f to these caches [35]. The Slavey cached their moose meat as moose meat was vital for winter survival [37, 89].

The Gitksan (Gitksan) and Wet'suwet'en hunted moose in fall and winter because the meat was better at this time easier to preserve, and there was a greater need for the meat [62]. The Chalkyitsik Kutchin of Alaska concentrate hunt in the last two weeks of September because it was the easiest time to kill moose, and because moose killed could be preserved without drying. Also, during this time, moose bulls were less cautious. They slaughtered barr year-old bulls in autumn, and larger bulls prior to the rut. In the winter, they slaughtered adult cows, preferentia a calf, and in late winter, they slaughtered young bulls [6]. The early part of mating season was prime time for the Kutchin to hunt bulls because they were very fat in this season [7].

Meat preparation

Moose meat is sweet and soft, and is considered very good meat, but if not well fed or if the animal suffers a viol before dying, the meat is hardly edible [123]. Moose meat is highly prized. The Algonquian and Iroquoian consid their beef [19]. Aside from caribou meat, the Hare craved moose meat the most; if they had not eaten moose or for three or more days, they felt their stomachs were not "satisfied" [27]. In addition to using the meat for huma the Red Earth Cree of Saskatchewan used it to feed their dogs [139].

Many cultures boiled or roasted the flesh for instant consumption [6, 9, 14, 71, 101, 104, 110, 145]. Moose meat, c and boiled in kettles, or boiled in shallow pans with vegetables and thick sauce. Slivers of moose meat can be frie used to make gravy with added flour. The flesh could be roasted, primarily outdoors. The brisket, hindquarters a considered delicacies [6, 9]. The meat can be boiled to make a soup and stock [14]. To cook meat at the kill site, t made a large impromptu cooking vessel by slicing part of a tree trunk, and hollowing the interior with fire and la or stones. When the vessel was complete, it was loaded with moose flesh and water, and hot stones in the vessel the meat. A bark ladle or the hand could dip the broth. The fresh meat could be roasted on skewers or straight o [14]. Moose meat was served on bark plates [16]. The Tanana used the moose skin or moose stomach as a boiling making a pit, lining it with the moose skin or moose stomach, which was pegged into the ground and added wat and the moose meat. The Assiniboine, Rapid Indians, Blackfeet, and the Cree boiled or roasted the meat in bark stones, and they roasted it skewered on a sharpened stick anchored in the ground angled near a fire [104].

Meat preservation

Moose meat is typically preserved by drying, salting, smoking or, at times, freezing [6, 7, 12, 15, 18, 19, 25, 27, 70, 110, 117, 121, 126, 133, 135, 137-139, 145, 149]. The Chalkyitsik Kutchin of Alaska are reported to cut the meat into thick by 2 to 3 inches wide by 12 to 24 inches long and hung them inside a domed drying rack to dry, often with a quicken the drying process and repel insects [6]. After drying, moose meat can be pounded and combined with c fat to make pemmican [139]. The Montagnais smoke-dry the flesh by slicing it from the bones, pounding it to ext slashing the meat to get it thin enough for the smoke to infiltrate, and extending it on sticks over a fire; the dried collapsed for storage [15]. Pemmican can also be made by grinding the dried flesh with bone marrow grease [13]. Liard Kaska also made pemmican. The Kaska are known to dry moose meat, pound it, and mix it with fresh berr babiche. After adding melted grease, the pemmican can be stored in untanned groundhog skins or in a casing m intestines" [84]. The tenderloin is considered a choice cut of meat and the Kutchin dried, pounded, and mixed it and perhaps berries, to serve at potlatches [7].

In summer, the Sahtu slice the flesh and sun-dry it, or dry it in a tent over a wood stove, and then smoke it to for that can be pounded to make pemmican [27]. In winter, the flesh froze rapidly, self-preserving it. With the intro freezers in home, moose flesh is frozen in summer for later use. The Tsimshian preserve the flesh by hanging m and then smoke: these were consumed dry or boiled for a few minutes to soften. Today, the flesh is preserved by freezing, jarring or canning [145].

The Tutchone make pemmican, pounding it with a hammer until it reaches a flour-like consistency. Moose fat c tiny pieces fried, and stirred into the crushed dried moose meat with added salt for pemmican [126].

The Cree and Kaska cut the meat into thin strips for drying in the sun and/or over a slow fire. It was then boiled consumption or made into pemmican with berries and melted moose fat or lard [71]. Pemmican could be store woodchuck hide or a casing of cleaned moose intestine [84]. Pemmican is also reported to be a popular prepara Chipewyan, Han, Tagish, Tutchone, Montagnais, Kootenay, Mi'kmaq, Penobscot and Nuxalk. In recent times, m home freezers has reduced the extent of pemmican preparation [12, 14, 18, 101, 110, 117, 121, 135, 139, 149].

Uses of bones

Moose bones have been important for preparing marrow, oil/lard and broth [6, 7, 9, 14, 17-19, 25, 27, 33, 44, 68, 84, 110, 111, 113, 117, 126, 133, 137-139, 150, 151]. Moose bones are prepared similarly by many cultures, including Chipewyan, Metis, Sahtu, and Gwich'in [6, 7, 18, 19, 44, 78, 82, 110, 139, 150]. The Dogrib consumed the marrow, cracking the bones into small pieces, and boiling to render lard and marrow [25]. The Mistissini Cree cracked the vertebrae to remove the marrow, which was typically eaten immediately; the cracked leg bones were used for soup and could be boiled several times to be consumed as soup or "tea" [71]. A special food called muuskamii, which is a boiling cracked moose' long bones was reported to be consumed cold, typically between meals. Muuskamii was prepared and cooled with clean snow. It was portioned first to the eldest male, then to other men in the family, and finally to the women. When initially prepared, a spoonful offering was placed in the stove [137].

The Kutchin made oil from moose byproducts by cutting fat from around the heart and kidneys, the lower back region, the front of the stomach, and the marrow. The fat was heated to make an oil, which was stored in viscera stomach sacs or sacs consisting of an inside-out intestine. Small intestine fat was conserved and used for soup [7]. The Kutchin made oil from bones and then placed it in a separate vessel, often the insides of a caribou stomach; this oil can keep well for two or three years [7, 111].

The Algonquian, Iroquoian and Slavey used extracted oil from the bones [19] to seal their birch bark food storage vessels. The hot grease was poured above food in the birch vessels, forming a wax-like substance [133, 151].

In addition to being a delicacy, oil/grease from moose bones is reported to serve as a medicinal by the Mi'kmaq and also used for feeding dogs by the Dogrib [9, 14, 25, 27, 110, 138].

The Tanana, Champagne and Aishihik, Gwich'in and Tlingit are reported to highly appreciate the moose broth [6, 117].

The bones were also reported to be used to make utensils, such as knife handles, spoons and bowls. Tools for hunting equipment, such as arrowheads and fish hooks were also made [9, 17, 27, 33, 84, 120, 123, 126].

Uses of other parts

All parts of the moose have been used by Indigenous Peoples in the sense of conservation and prevention of waste. Uses include the nose, tongue, head, organs, stomach, heart, genitalia, intestines and other entrails [6, 119, 139].

Moose nose is considered a delicacy by many cultures [13, 76, 82, 110, 120, 123, 150]. The Tutchone are reported to consider moose nose a delicacy and prepare it by placing the nose on a fire, allowing the hair to be singed off before taking it off. After removing any remaining hair, cooling it and slicing it into six to eight pieces. These pieces are boiled for about an hour from the boiling water and salted to complete the dish. The Tutchone also make a special dish called moose head cheese by skinning the moose leaving the eyes intact, placing the head in a roasting pan, and roasting covered for about four hours at 300 degrees Fahrenheit. While roasting, the head is basted with water every hour. Once done, the head is removed, the skull, the meat cut in tiny pieces and the eyes removed. The meat is then placed in a large pan, covered with the fat from the roasting pan and cooled to form moose headcheese. They also made moose liver and blood soup by cutting liver into small pieces, adding four cups of moose blood, and boiling the mixture. Small pieces of dried moose fat were fried in oil and added to the liver and blood with some water [126].

The Gwich'in are reported to eat the ears, fat, lungs, eyes, nose, tongue, kidney, heart, the cartilage surrounding the head and the liver. They consider moose nose, boiled or broiled a delicacy, and considered moose eyes an even greater delicacy especially among the children. They highly favor the kidneys and these were typically the hunter's reward. [7]. They are reported to eat the fetus, ribs, kidney and intestines, and considered the fetus a delicacy, usually reserving it for special occasions [71, 137]. They cooked the ribs and kidneys on a spit and smoked the intestines on skewers over an open fire [71].

The Hare are reported to relish moose mammary glands when the female is lactating in summer. [27]. Other moose parts reported for particular cultures are: Mi'kmaq eating small intestine [14], Kaska and Cree eating antlers and antler velvet [15], Han eating moose feet [38], Gwich'in eating roasted head [112]. The Kaska drank moose milk, and blood was a particularly effective medicine to recover from extreme hunger [84].

Moose stomach and hardened skin are reported to be used for cooking vessels (with hot rocks) and storage containers [34, 44, 84, 110, 117]. The Upper Tanana usually used a birch bark container to boil moose meat, but if there was no birch bark present, for example on the hunting trail, they used the moose skin or moose stomach as a boiling vessel. When using moose skin or stomach as a vessel, they made a pit, lined it with the moose skin or moose stomach, which was pegged in place and added water, hot stones and the moose meat. Sometimes, they steamed pieces of moose meat in the moose stomach container over a small fire [110, 120]. Moose hide is reported as having been used for making canoes by several

Many cultures shared moose meat [6, 7, 12, 18, 22, 25, 27, 29, 71, 84, 110, 117, 133, 137], and it was an item of trade [115]. Sharing continues to be an important cultural value, and moose meat was often used as a gift. Among the Kootenay, if the moose hunt was very successful, moose was shared with all. The Mistissini Cree hunter gave some of the head and some of the token meat to every family in the camp [71]. After the remaining carcass was returned to camp, the hunter distributed the raw meat with the whole community, with the muscle meat portioned equally among all the families, and if the hunter was running short, another private distribution occurred for this family [137]. After a productive moose hunt, the Salween Cree distributed moose among all the members of the same camp or presented some to his relatives as a gift. In early times, moose meat was given to his hunting companion or a fellow camper distributed it among the households in the camp [137].

Beliefs and taboos

There are various ideologies and rituals associated with moose that are summarized from the ethnographic literature. Before moose hunting, the Kootenay participated in a religious ceremony consisting of singing, dancing and chanting. After a successful hunt and the Malecite set up powwows in locations where moose had been unsuccessfully hunted in order to ensure a better success on the next hunt [8, 12]. To obtain optimum weather for hunting moose in winter (stormy weather and heavy snow), the Cree performed rituals such as shaking a rattle and tambour and singing to the Great Spirit and the Mountain Winds, placing sweet smelling herbs on a tiny fire for the Manito, and smoking and singing to him for a wind [10]. For the Beaver, moose hunter success was ascribed to supernatural power or the supposed inclination of the moose toward the hunter [20]. The Kaska believed that if a woman saw the hunter's moose scapula the hunter could lose his ability to hunt. During the moose-calling season, a Kaska man never brought his moose scapula into the camp in case a woman looked at it [84]. The Peel River Kutchin utilized scapulimancy (divination using a moose scapula) to aid them in hunting. The Ahtna believed that for three days after the slaughter, the moose flesh and hides were still connected with their spirits. If babies touched them during this period, the babies would become sick. They never carried the meat and hide through the door of the house, only through the smoke hole, and in latter times, the window [44]. The Algonquian and Iroquoian cultures forbade menstruating women to touch discarded moose bones and they kept discarded bones away from the fire, and never burned moose bones and never let dogs eat the bones [19, 44]. It was taboo for the Hare to discard moose bones; they were allowed to throw them in lakes or woods [27]. It was taboo for Dogrib boys or girls to eat moose head. The Dogrib believed that if they did so, the children would suffer headaches as adults [25]. They also believed that if a girl ate moose hair her hair would turn prematurely white. Children were also not supposed to eat moose fetuses or udders and it was taboo for anyone (child or adult) to eat moose brain; if he did so, he would never be able to slaughter moose again [25]. The Kootenay carefully displayed moose antlers at the campsite, hanging them on a stump near camp soon after its slaughter, and kept them until the next spring, and the Montagnais hung the antlers with the skull attached on a tree out of respect for the moose [152]. The Mistissini Cree placed them near the shore, always facing the east or southeast, no matter the direction of the wind [71]. There is inconsistency as to whether Sahtu Hare women were allowed to kill moose. One informant said women were successful moose hunters, while another said it was taboo for women to slaughter moose [27]. Prior to moose feasts, the Malecite hung the moose on a scaffold in a gigantic wigwam [8]. The moose is featured in Algonquin legends and is featured in Micmac tales [151, 153].

Feasts

Moose is an important component of feasts by many First Nations, including the Malecite, Han, Gwich'in, Dogrib and Kootenay [7, 8, 12, 25, 27, 38, 112, 137]. Among the Gwich'in it is reported that the person who killed the moose was the organizer of the moose feast. Rather, if the hunter was a member of one clan (e.g. the Crow), he would give the feast to a different clan (e.g. the Wolf) whom he knew wanted to give a feast, for example to celebrate the birth of his child. The moose was butchered near the feast giver's home with the help of several men and women, stoves were placed outside, and the moose was cooked in large kettles with the feast giver's firewood. The feast would occur in the evening at the community table. The table was placed in the center and people encircled the table on benches. The moose meat along with other food was distributed to everyone present, with some reserved for those who were absent. The moose meat was shared among all members of the community in a ceremonial mode, and the amount of shares was proportional to the amount of land owned or living in a household [112]. As noted earlier, the Kootenay are reported as one of the few cultures in which the entire community- men, women and children- went on a moose hunting expedition. After the moose was slaughtered, the hunters and children used jagged rocks to skin the moose and prepared its flesh and pelt, and they all feasted on the moose until all families had had their fill [12].

Conservation and ecological change

Most indigenous cultures are reported to practice conservation practices while hunting moose [19, 59, 62, 97, 107]. The Waswanipi Cree believed that keeping a limit to the hunt was their responsibility. They practiced conservation by rotating hunting territory, with the premise being that by not exploiting a given hunting region each year, the hunters gave the moose population a chance to grow. Some habitually rotated their land use, others let their land "rest" intermittently, and others observed rotation by sectioning their land into subsections so that each section could be used in turn [59]. Algon

Iroquoian peoples are reported to undertake a constant game census on their hunting territory to identify the location of moose. They would section the territory into four parcels, and hunt one section each year so that the population in other sections could be replenished. At times, they reserved a fifth section in the middle of the territory they hunted only in times of enormous need. The Cree noted frequency of moose signs, twin birth rates and age to monitor moose counts and used this knowledge to practice conservation by instituting hunting restraints [97,

Ecological change can result in increase or decrease in moose populations. Forest fires, transitional forests, char deciduous plants upon which moose thrive, changing density of other large mammals (e.g. North American elk) Hydro projects creating dams that disturb shore lines, climate change, and human population density have all affect numbers moose in habitat areas [21, 27, 35, 36, 48, 56, 62, 97, 106, 114, 116, 125, 128, 135, 139, 144, 154].

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Moose (*Alces alces*) are a very large, blackish brown, hooved mammal present in the boreal forests of North America and Scandinavia. In North America, moose are found from Newfoundland in the east (where they were introduced) to the Pacific coast in the west, from New England and northern Rocky Mountain states in the south to above tree line in Alaska and Canada. North American moose are frequently subdivided into 3-4 subspecies including the smaller-sized moose in the northern Rocky Mountains, the enormous Alaska-Yukon moose in the extreme north-west of the continent, and the intermediately-sized Canadian and/or eastern subspecies spread across the rest of the range.

Like in other members of the same family, including deer (*Odocoileus* spp.), North American elk (*Cervus elaphus*) and reindeer (*Rangifer tarandus*), velvet covers male antlers as they grow in late spring and summer, then is rubbed off and shed in late summer prior to the autumn mating season referred to as the rut. Bull moose shed their antlers in winter, well after the completion of the rut. The Latin name *Alces* means “elk”, which was erroneously used by the first American settlers. The common name is original.

Moose are tall, long-legged, and hump-shouldered with big ears and an enlarged overhanging snout. Despite the odd and gangly appearance, they are impressive when encountered in the wild. Adult moose typically weigh 462 kg, with the largest individuals exceed 700 kg and 2 m tall at the shoulder. Moose are largest in Alaska-Yukon, smallest in the northern Rocky Mountains states, and of intermediate size in the rest of their range across the mixed and boreal forests of the northern U.S. Bulls are notably bigger than females (cows). Adult male antlers develop into large flat palms with long points projecting from the front, and shorter, rounder points projecting from the sides and back. Antlers can be nearly 2 m wide and weigh up to 25 kg. Moose have a distinctive skin flap extending down from their throat, called a bell or dewlap, which is much larger in males than in females.

Moose lives in a wide range of habitats consisting of boreal forest, mixed forest, large delta floodplains, tundra and shrub, and stream valleys. They are most abundant in habitats with abundant new vegetation growth, including areas recovering from recent forest fires or other forms of disturbance. Moose are browsers that consume vast quantities of leaves and twigs from shrubs and trees, typically from willow, aspen, and birch. They also eat grasses and aquatic plants in summer. They are commonly found near lakes, streams, ponds, marshes, and swamps. In winter, moose avoid deep and heavy snow by traveling less and by using habitats with more over-story cover. Some moose are resident and use the same home range year round, but some moose are migratory and use separate winter and summer ranges. Migratory moose tend to have high fidelity to their seasonal home ranges and will return to the same location year after year. Wolves, grizzly bears, and humans are the principal predators of moose, but tend to target young or weak animals and are less of a threat to prime-age moose.

Cows first breed between one and two years of age and are receptive to bulls once a year during the autumn rut. Cows are brown and are born in spring and weaned in late summer. Cows give birth to a single calf, or occasionally twins. Calf calves are less likely to associate with other moose, but become more social towards the autumn rut. Bulls associate with each other in summer, but with cows only around the rut. In most moose populations, rutting bulls wander and are solitary, receptive females, with both sexes vocalizing and relying on scent to locate each other. However, some moose populations have a more communal mating system with bulls occupying individual mating areas and scent marking them. Multiple females attracted to a given bull mating area. Moose can live as long as 20 years in the wild and females live longer than males.

There are an estimated one million moose in North America. Populations are thought to be stable on a continental scale, but trends vary widely from region to region in relation to forest fires, forestry, harvest intensity, predation, and disease.

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