Įłts′usi Thëlai (Dëne)

Wanihikewin (Cree)

Trapping

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A unit in the series:

Rekindling Traditions:
Cross-Cultural Science and Technology Units

Series Editor

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CURRICULUM CONNECTION

Grades 9-11: energy, pressure, and structure & design

OVERVIEW

Beginning with a foundation in the Aboriginal science and technology of trapping small, fur bearing animals, students examine Western scientific ways of explaining forces, pressures, and energies, at work in the contemporary hunter's trap mechanisms. The unit culminates in the economic and political elements of trapping. We can care for Mother Earth by living the principles of conservation applied to people and animals. Duration: about 2 weeks.

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PURPOSE

This unit is designed to enrich students' appreciation of Aboriginal science and technology related to trapping small, fur bearing animals (such as beaver, marten, mink, red fox, wolf, and coyote). The main aim is to pass on to students a lifestyle of past generations whose survival depended on trapping. Today this lifestyle can be learned for recreational or for scientific wildlife management purposes. The unit should demonstrate to students that they can achieve at Western science without setting aside their Aboriginal values and knowledge. Another aim, therefore, is to create an interest in Western science concepts and thereby encourage students to continue their studies in school science. A Western education is needed for success at commerce. The unit makes a connection between everyday life in a northern Saskatchewan community and physics content in the school curriculum. Knowledge of trapping (past and present) forms a bridge between Aboriginal and Western views of nature. The unit invites students to think in two worlds – the world of Aboriginal culture and the world of Western culture – helping students resolve the issue of how to care for Mother Earth. Technological literacy is given special emphasis by embedding the technology of trapping in economic and political realities of today. Students are expected to critically analyse social issues around trapping, as well as investigate Western scientific explanations of small animal traps.

GOALS

1. To connect students with their community's heritage.
2. To connect the technology of traps to a specific animals and their environments.
3. To see the influence of social values on how technology is designed.
4. To impress upon students the importance of the care and proper maintenance of tools and equipment.
5. To instill in students the sense to think ahead to avoid dangerous situations.
6. To construct the scientific ideas of pressure, kinetic and potential energy, forms of energy, and

conservation of energy.

7. To relate scientific terms and concepts to everyday knowledge.
8. Science ideas are like useful stories.
9. To increase a student's understanding of technology and the political/social/economic forces of change in today's world, such as the whims of the market on a resource-based industry.
10. To show students that trapping, fishing, and hunting are no longer viable industries for employment for most people, and so other occupations must be pursued. This positions education (access to those occupations) as central to students' well being and in their best interest.
11. To experience a real trap line.
12. To get students to interact with their environment and their community.

OBJECTIVES

1. Students will be able to describe several incidents that represent normal events that occurred in the old days.
2. Students will be able to explain how snares, pitfalls, and cages have been used for survival.
3. Students will be able to identify several different types and sizes of traps (Conibear, leg-hold, live traps).
4. Students will be able to identify which animals are trapped by different examples of traps.
5. Students will explain why animals' habits and habitats influence the method of trapping and the type of trap used.
6. Students will define criteria for humaneness of traps.
7. Students will develop a facility to handle traps safely.
8. Students will be able to describe "striking force" (i.e. kinetic energy in Western science) and "impact force" (i.e. "pressure" in Western science) as applied to traps and as applied to other everyday events.
9. Students will be able to calculate the pressure involved in some everyday events.
10. Students will be able to design and carry out a scientific experiment to test the pressure of different traps.
11. Students will distinguish between commonsense language and Western science language, and will be able to know which one is being used at any given moment.
12. Students will be able to describe energy as taking one of several different forms: kinetic, heat, electrical, light, nuclear, sound, chemical, etc.)
13. Students will recognize that the physics idea called "conservation" is a cultural assumption in Western science (similar to a cultural myth); e.g. conservation of energy.
14. Students will be able to describe potential energy and relate it to kinetic energy, as it applies to traps and other occurrences.
15. Students will construct various causes and effects associated with economics and politics in the fur trade industry.
16. Students will realize that trapping is no longer a sustainable industry in the north today.
17. Students will discover the extensive hard work it takes to maintain a trap line.
18. Students will read at least part of a novel (fiction or non-fiction) related to trapping.
19. Students will write a personal analysis of their reading.

BACKGROUND INFORMATION

The Dëne and Cree for “trapping” are *įłts ́usi thë̀lai* and *wanihikewin*, respectively. These original words are used in this unit. You should accumulate other indigenous words and expressions to incorporate into your lessons and student assessments (e.g. names of animals), learning them yourself as you go along. The validity of a community’s knowledge and a student’s cultural identity is underscored by the non-trivial use of appropriate language.

A Brief History of Traps (a Western European viewpoint based mainly on Bateman, 1971)

As far back as 40,000 BC, a time before *Homo sapiens* appeared on earth, cave dwellers likely used foot traps, pitfall traps, and snares to catch animals. Evidence for this comes from cave drawings, analysed by archaeologists. For instance, stone age Cro-Magnon people with their unpolished chipped stone tools, probably used branches, plant fibres, and animal parts to creatively design and produce their snares and foot traps. Trapping was all about survival. It not only brought in food (mammals, birds, insects, and fish), but it also helped to protect against dangerous animals and pests.

Much later, during the period 4000 - 2400 BC in Europe, people began growing crops and rearing stock. (This occurred much earlier in Asia, 9000 - 6000 BC). At the same time, tools improved and so did the traps used by the community’s hunters. The improvement of traps continued during the bronze age (about 1000 BC) and the iron age (about 250 BC). In the ancient cultures of Egypt, Greece, and Rome, traps were not considered important enough to be part of their recorded history, and consequently little is known about their traps.

Europeans became interested in mousetraps to control rodent pests. The development of iron mousetraps (traps with metal spring mechanisms) in Europe was just beginning in 1500 AD, about the same time Europeans began colonizing North America. Explorers’ stories about the rich furs in the “New World” may have speeded up the development of iron traps in Europe for use in the North America. The first European “settlers” surely would have brought with them common iron traps of their day. These would need to have been fixed by the local blacksmith, thus giving impetus to the technology of iron traps and to a future industry in North America.

Survival was the colonists’ main preoccupation at first. They survived, in part, by learning how to trap using First Nations technology. Aboriginal people generously shared their knowledge of trapping and shared the technology that their culture had creatively designed with materials provided by Mother Earth (plant fires, logs, rawhide, animal sinuses, etc.). First Nations peoples had had a long history of trapping large fur bearing animals (buffalo, bear, elk, ungalates, etc.). Pelts were used for clothing, of course, but they were also used as barter in the inter-nation trading that had long been established in North America (Turtle Island) before Europeans appeared on the scene. Thus, it was natural for Aboriginal people to exchange their furs with the first European colonists in return for useful manufactured items from Europe.

However, the Aboriginal peoples had no way of knowing the extremely high value placed on furs by European culture. In Europe, before contact, ermine fur had decorated the robes of the highest church and state dignitaries. Other favourites included mink, sable, and blue fox.

The European colonists were not nearly as generous in sharing this cultural knowledge as the First Nations peoples were at sharing their cultural knowledge of trapping. As a result, Aboriginals were exploited by the settlers and fur traders from all European countries involved in North America. Thus, the very first chance for economic development by Aboriginal peoples in competition with Europeans was not conducted on an “level playing field.” In the early days, the cost of transporting pelts back to Europe was very high and there were many “middle men” to pay along the way. To be profitable to European merchants, the fur business had to have a high volume of pelts at the trapper end of the industry.

Over the next three hundred years (the 1600's, 1700's and 1800's), the trapping industry grew. It took at least a century for European trappers to become competent with the Aboriginal skills of trapping, even with their European technology. The most popular trap for Europeans was the “log dead-fall” trap (taught to them by First Nations trappers) in which an animal would trigger the fall of a heavy log onto itself. Europeans also used English rat traps (called “gin” traps in England). These were spring traps made of iron. Although some Europeans became excellent trappers, their survival was not all that good. Bateman (1971) describes how 300 trappers went into the Rocky Mountains to open up “new” territory in 1820, but only 3 could be found by 1850.

By 1850, the fur trade industry had reached an all time high and there was a great demand for steel traps. This motivated a new manufacturing industry in North America. The new industry can be traced back to a farm boy named Newhouse, in upper state New York. In the early 1800's, Newhouse grew up on the family farm adjacent to an Iroquois reservation where bear, deer, and wolves roamed at the time. He learned Aboriginal science and technology from the Iroquois hunters (including a respect for nature and a knowledge of nature) which he creatively combined with his Western cultural knowledge to invent new types of traps, much improved over the English traps. By 1823 at the age of 17, Newhouse was producing 50 spring traps a year with the help of a local blacksmith shop. Because of their high quality and dependability, his traps increased in popularity and his production rose to 2,000 traps per year by 1850. Then he sold his trap design to a company called the Oneida Community which mass produced them, known as the Newhouse trap. In turn, this company was bought out by bigger companies. Eventually the Animal Trap Company of America became the leading manufacturer of Newhouse traps.

Newhouse was respected by his Iroquois neighbours for his gentleness and for his knowledge of nature. Obviously he was also very knowledgeable about iron and steel and about designing mechanical things – knowledge from his Western culture. He ended up integrating some of his Aboriginal and European knowledge. His creativity and his economic success were both improved by his cross-cultural approach to trap design. Newhouse exemplifies the potential advantage of a bicultural science and technology education for both Aboriginal and non-Aboriginal students.

The next major development in trap design came in the 1930's and 1940's as a result of government legislation that encouraged “quick kill” trapping. Verbail and Havahart traps were invented as humane traps. Paraphrasing Bateman: whenever we engage in a practice that puts the lives of our fellow creatures in jeopardy, we have a moral obligation to examine our motives and to assess our methods. Elders in Aboriginal communities have always instructed their people on the proper respect for fellow animals on Mother Earth.

Throughout the history of fur trading industry in North American, as trading expanded animal populations diminished dramatically. For example, when the under wool of a beaver pelt became popular in Europe, suddenly trappers in North America (Aboriginal and non-Aboriginal) sought this high paying pelt. When the beaver became scarce (almost extinct), the muskrat was a popular substitute. Then the muskrat numbers soon diminished. Sustainable development was a problem back then.

tsá (beaver)

dzën (muskrat)

The first organized effort in Canada to use conservation principles came in 1821 when a Hudson Bay Company manager put a quota on beaver pelts, banned the trade in cubs and summer beavers, reduced the number of trading posts, and implemented trapping seasons. The manager also organized trap lines that he assigned to various Aboriginal bands. Furs that came from outside these trap lines were refused by the Hudson Bay Company.

Wildlife Management

Regulations increased in the 20th century with the introduction of wildlife management. Wildlife scientists and engineers have tried to collect data on animal populations and to conduct experiments on population dynamics, but not enough human and financial resources have been provided to do a proper job. Scientific investigations depend on support from businesses and governments.

Sustainable development involves managing each population of fur bearing species. In addition to this management, however, we need laws to prevent over-exploitation and we need policies to secure stable habitats for those fur bearing animals. All of these are important to a management plan.

Animals living in a healthy natural habitat are able to produce a sizeable offspring each year. Compared to big game animals, smaller fur bearing animals tend to reproduce more quickly. Sometimes their populations literally explode. The young animals, if not harvested, will soon die because of a lack of good food and safe cover. When a population is too large, over crowding and massive die-offs occur due to disease, failure to breed, adults eating the young, etc. After such a population crash, large regions may be virtually without a species for several years. The annual harvest of fur bearing animals helps to prevent major population fluctuations that would otherwise occur. Where populations are well managed through harvesting, and their habitat is in kept in good condition, disease rarely reaches epidemic proportions, litter sizes are large, the general health of all animals is improved, and the population growth rate is stabilized.

A lack of trapping can lead to other kinds of problems. In northern Saskatchewan, for instance, too many beavers cause flooding, which in turn results in damage to commercial timber, upland habitat, and roadways.

Gilbert Proulx, in his book *Mammal Trapping*, shows that different animals have different capacities to recover from a reduction in their population. This characteristic he calls "resiliency." Highly resilient animals include the muskrat, coyote, red fox, and short-tailed weasel; while the swift fox and wolverine have low resilience. The highly resilient animals have a gestation period (time between breeding and birth) between just 30 and 60 days. Wildlife scientists such as Proulx suggest that if sustainability in populations is to be achieved, fur bearing animals should be classified in terms of their resiliency, and then be managed according to their resiliency.

Trappers must learn about animal behaviour so that they can put together good "sets" (the immediate vicinity where traps are placed). Good sets lure animals. Bait, scents, specific location, and the visual surroundings are all important to keep in mind. However, knowing animal behaviour and understanding their ecological relationships within their habitat is only part of good wildlife management.

Fur bearing animals, like all wildlife, need a secure home (stable habitat). In northern Saskatchewan most of the habitat is in the form of boreal forests. The different species of trees and shrubs, and the variety of sites they grow on, provide many different habitats. Animals depend on food and cover available in the habitat. In the forest, moisture conditions are generally excellent and provide for rapid growth of vegetation in the summer months. But other conditions limit northern plant growth: the short growing season, soils low in fertility (sandy or acidic), extensive Precambrian bedrock with no topsoil to sustain healthy plants, and severely cold winters. Because the land is constantly changing (e.g. due to forest fires), the ecological makeup of an area will change over time. A typical change over 200 years in a northern Saskatchewan boreal forest is shown in Figure 1. It also indicates which animals tend to live within each type of plant community. The "succession" process over 200 years creates a variety of habitats available to wildlife populations.

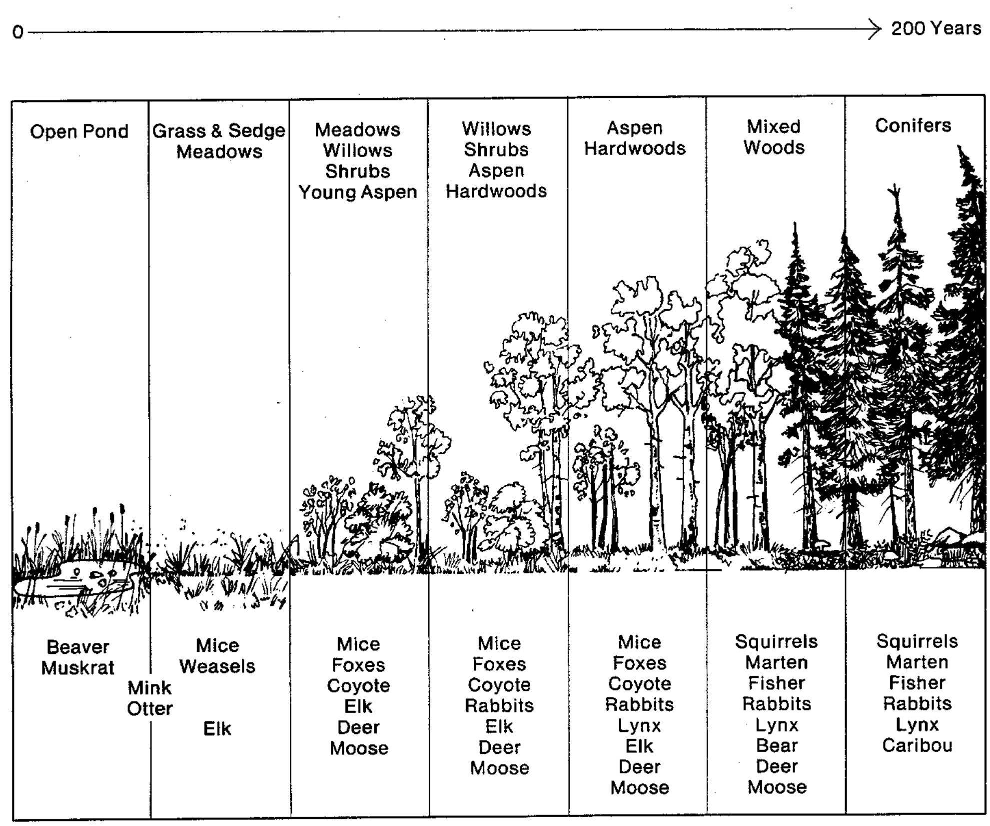

Figure 1. Plant Succession and Wildlife Population (Source: *Saskatchewan Trapper Education Manual*)

Secure habitats of fur bearing animals can also come under strain from humans. Some of the most important habitat areas are along streams, rivers, and lakeshores, which can be damaged by road construction, logging, mining, agriculture, and real estate development. In order to prevent more wildlife habitat being lost to human development, the Saskatchewan government in 1985 designated 1.2 million acres of crown land containing important habitat areas for protection under the Critical Wildlife Habitat Protection Act.

Today, trapping continues to be a source of income and a way life for some people in northern Saskatchewan, a recreational activity for others, and an important sustainable development technique for scientists and engineers working in the science of wildlife management.

For more details on the history of trapping and wildlife management, consult Bateman's *Animal Traps and Trapping* (1971), but be vigilant. Bateman's point of view reflects an earlier generation British culture in which colonizing viewpoints and colonizing language flourished. For an American point of view, see Sydney Greenbie's *Frontiers and the Fur Trade* (1929), a book as much about individualism versus the big companies, as it is about fur trading. Proulx (1999) provides a Canadian scientific perspective on wildlife management, but he has few historical details. The *Saskatchewan Trapper Education Manual* gives many tips on wildlife management specifically for Saskatchewan.

Limits of Western Science

There is an excellent lesson about the nature of Western science to be learned from the history of trapping. At no time in the history of trapping could inventors of traps apply scientific knowledge of their day (e.g. Newton's laws of motion) to the task of designing a better trap. Instead they relied on their technical knowledge of past traps (prototypes) and on their community's knowledge of animal behaviour. Western science had been pre-occupied with *taxonomic* relationships among animals (how to classify them all) and had given little attention to a theory of animal behaviour. In other words, scientific knowledge was not useful to the everyday trapper. Scientists had been asking the wrong kinds of questions about nature. As a result, Aboriginal knowledge was far richer and more useful to trap designers. A knowledge of trapping was not important to the European intellectuals who institutionalized science in the 1600's.

The intellectuals apparently valued colonizing much more. Their taxonomic studies in science indirectly encouraged colonization by spurring the search for new species world wide (so they could test their classification schemes) and by dismissing Aboriginal knowledge of animals (Mendelsohn, 1976). The *behaviour* of animals was not, until recently, a particular concern to Western scientists.

Therefore, we can see that the content of Western science was influenced by the culture of Western European nations: taxonomic studies were valued over a knowledge of animal behaviour, and as a result, taxonomies prevail as privileged knowledge in science class rooms today. As a consequence, Aboriginal knowledge struggles to be recognized as a valid description of nature. Recently, a number of ecology scientists have begun to learn the rich knowledge that resides with some Aboriginal Elders (Corsiglia and Snively, 1995). Their knowledge is called "traditional ecological knowledge."

Resources

BEST:

Proulx, Gilbert. (1999). *Mammal Trapping*. 229 Lilac Terrace, Sherwood Park, AB, T8H 1W3, Alpha Wildlife Management Ltd. ISBN 0-9686235-0-6

Saskatchewan Education, Northern Division. (1990). *Saskatchewan Trapper Training Manual*. La Ronge, Saskatchewan Education, Northern Division. **Appendix A.**

Saskatchewan Parks & Renewable Resources. *Saskatchewan Trapper Education Manual*. (No publication date or source. OUT OF PRINT)

New Brunswick Fish and Wildlife Branch. (1971). *Humane Trapping Methods*. Fredericton, NB: Dept. of Natural Resources, Fish and Wildlife Branch. (OUT OF PRINT)

Nadashy, Paul. (1999). The Politics of TEK: Power and the "Integration" of Knowledge. *Arctic Anthropology, 36* (1-2), 1-18.

OTHERS:

Bateman, James A. (1971). *Animal Traps and Trapping*. Harrisburg, PA: Stackpole Books. Excellent history. Written from the author's UK perspective. ISBN 0-8117-0103-4.

Runge, Wayne. (1995). *A Century of Fur Harvesting in Saskatchewan*. Prince Albert, Sask.: Saskatchewan Environment and Resource Management.

Readings for Students
In the following books, each chapter can stand alone. Some are about individual persons. At least one of the chapters is bound to match the interest of each of your students.

Karras, A. L. (1975). *Face the North Wind*. Don Mills, Ont.: Burns & MacEachern. ISBN 0-88768-064-X

Karras, A. L (1970). *North to Cree Lake.* New York: Trident Press. SBN 671-27071-0

Tetso, John, (1970). *Trapping Is My Life*. Toronto: Stoddart. ISBN 0-7737-5705-8.

The internet web sites deal with organizations and outfitters. None are recommended at this time.

References for "Background" section

Proulx, Gilbert. (1999). *Mammal Trapping*. Sherwood Park, AB, Alpha Wildlife Management Ltd.

Bateman, James A. (1971). *Animal traps and trapping*. Harrisburg, PA: Stackpole Books. Excellent history. Written from the author's UK perspective.

Corsiglia, J., & Snively, G. (1995). Global lessons from traditional science of long-resident peoples. In G. Snively & A. MacKinnon (Eds), *Thinking globally about mathematics and science education*. Vancouver, Canada: Research & Development in Global Studies, University of British Columbia.

Greenbie, Sydney. (1929). *Frontiers and the Fur Trade*. New York: John Day.

Mendelsohn, E. (1976). Values and science: A critical reassessment. *The Science Teacher*, *43*(1), 20-23.

ACKNOWLEDGEMENT

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tsádhëth kanįdhëni dënë (trapper)

Lesson 1: *Hunting Before Metal Traps*

nunië (gray wolf)

Timing
1 class

Goal
To connect students with the community's heritage.

Objectives
1. Students will appreciate the old way of life.
2. Students will be able to describe several incidents that represent normal events that occurred in the old days.
3. Students will be able to explain how snares, pitfalls, and cages have been used for survival.

Aboriginal Value to be Conveyed
respect for Mother Earth – reverence for the animals

Instructional Strategies
direct

Lesson Outline
1. Have a trapper or Elder come in to tell students how people trapped in the old days.

CELs / Subject Integration: Social Studies

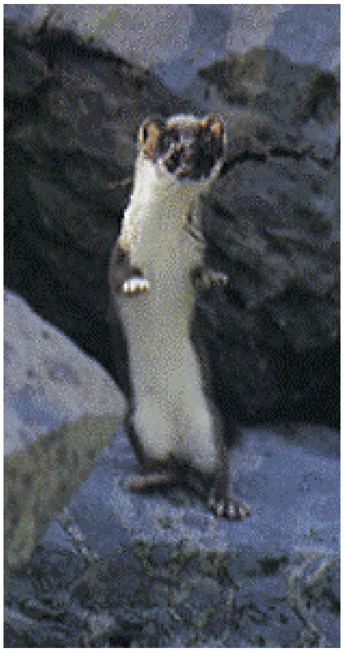
Resources
local expert,
materials to create interest (hides, fur and hide clothing, traps, photos)

chízë (lynx)

Teacher Notes
Before the speaker comes in, have students draft questions that they would like to ask; e.g.:

What types of animals did you trap?
How was the animal useful to the people?
How important was life on the trap line?
How hard was life on the trap line?
How would people trap animals before metal traps?

Lesson 2: *Traps*



tëłk´aiłi (weasel)

Timing
1 to 3 class periods

Goals
1. To connect the technology of traps to a specific animals and their environments.
2. To see the influence of social values on how technology is designed.

Objectives
1. Students will be able to identify several different types and sizes of traps (Conibear, leg-hold, live traps).
2. Students will be able to identify which animals are trapped by different examples of traps.
3. Students will explain why animals' habits and habitats influence the method of trapping and the type of trap used.
4. Students will define criteria for humaneness of traps; e.g. striking an animal with sufficient energy and in a vulnerable spot so as to render the animal irreversibly unconscious within 3 minutes
5. Students will describe how the designs of traps have changed as a result of the criteria of humaneness.

Aboriginal Value to be Conveyed
respect for Mother Earth – reverence for the animals

Instructional Strategies
individual, direct

dlíë (squirrel)

tëhjuzi (mink)

tha (marten)

nąghai (wolverine)

Lesson Outline

1. Students, individually of in pairs, research the different traps that are used in trapping; e.g. quick kill, leg-hold, recovery traps; etc. If at all possible, show and demonstrate real traps. Reference books need to be available. (See Resources, below. Background information is found in the Teacher Notes section, as well.)
2. Students make a class or public presentation of their findings. The following chart may help.

Animal	Habitat	Habits	Type(s) of Traps	Type of Set
1				
2				
etc.				

CELs / Subject Integration: communication, Biology, structure & design

Resources

various types of traps
books and pamphlets listed in the "Background" section, especially:
Appendix A: *Saskatchewan Trapper Training Manual*.
Proulx, Gilbert. (1999). *Mammal Trapping*. Sherwood Park, AB, Alpha Wildlife Management Ltd.
Saskatchewan Parks & Renewable Resources. *Saskatchewan Trapper Education Manual.*

Teacher Notes

- Encourage students to get information from people in the community on an animal's habits and its habitat. Ensure that students show the proper respect whenever they gather this traditional (indigenous) information. Providing a small gift to the person giving the information may be appropriate. Instruct students on the community's traditions and protocol. Be sure that the person giving the information also gives their permission to use their knowledge in the classroom.

BACKGROUND INFORMATION FOR LESSON 2

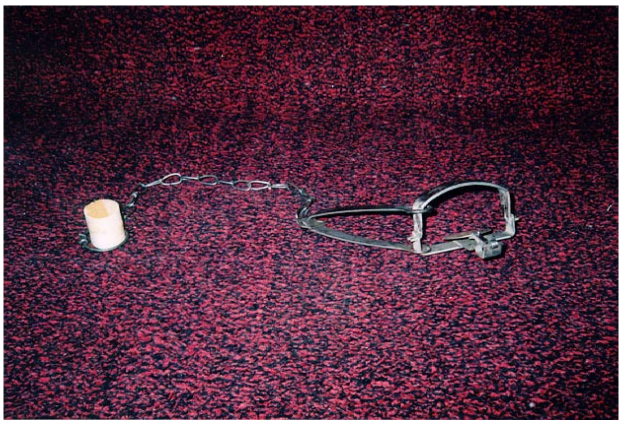
Traps are designed to either kill or to restrain animals. In this unit, I concentrate on (1) some quick kill traps for fairly small animals, and (2) a few restraining traps for larger animals. I do not cover the whole domain of trapping. For instance, I do not deal specifically with mousetraps, snares, cage traps, or killing box traps, or the techniques of hiding and baiting a trap. But these topics could certainly be extensions to the unit, and they would be good for a local trapper to talk about. The basic information here is to prepare students for understanding what a trapper is talking about, and to prepare students to ask good questions in Lesson 7.

Gilbert Proulx classifies traps as "conventional" technology or "state-of-the-art" technology, depending on how well a trap meets performance standards related to animal welfare. His *standard for humane trapping* can be summarized like this: striking an animal with sufficient energy and in a vulnerable spot so as to render the animal irreversibly unconscious within 3 minutes. The larger the animal, the more energy it takes to render it unconscious within 3 minutes. (Proulx discusses his standards on pp. 32-36 in *Mammal Trapping*.) A state-of-the-art (humane) trap will render $\geq$70% of animals unconscious ≤ 3 minutes 95% of the time. Scientific studies are conducted on new designs for traps to determine which trap and which size is best for which animal (see Table 2 at the conclusion of this Background Information for Lesson 2, p. 23).

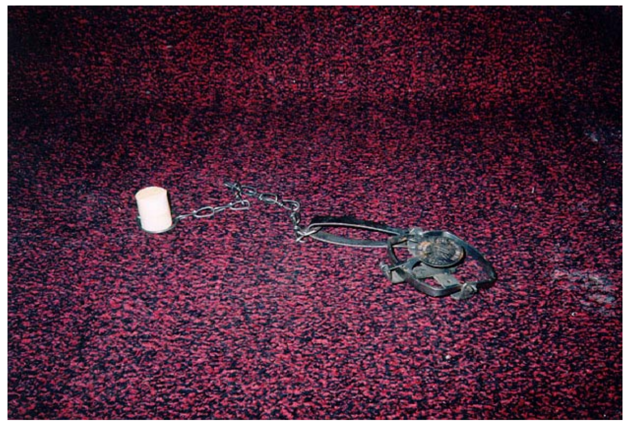
The types of traps conventionally used in the La Loche area have been the leg-hold and Conibear traps. More state-of-the-art technology, recently designed, is now available, such as the C120 Magnum and the Bionic traps. These are all mentioned in the following pages.

Leg-Hold Traps

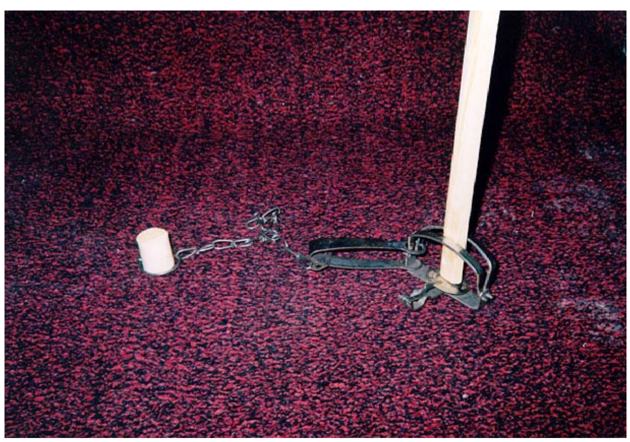
The three photos below show a conventional, small, leg-hold trap (size 1½) designed with a steel jawed, coil spring mechanism. This trap would be set for a marten, skunk or small fox.



Small leg-hold trap: unset



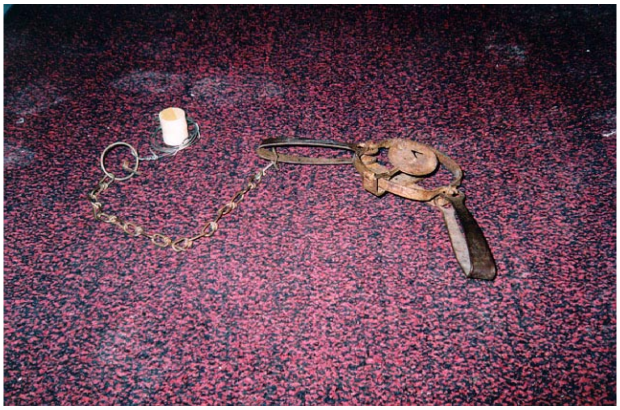
Small leg-hold trap: set



Small leg-hold trap: sprung

These leg-hold (foothold) traps are manufactured as steel-jawed coil-spring traps, as padded coil-spring traps, or as long-spring traps. Each type of led-hold trap comes in different sizes (1 to about 5) for trapping different sized animals. The small leg-hold trap shown above is a steel-jawed number 1½ .

The next two photos show a conventional, large, leg-hold trap (about size 2½) used for a fox, coyote, or wolf.

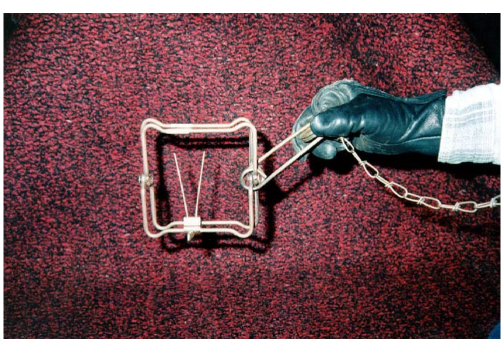


Large leg-hold trap: set

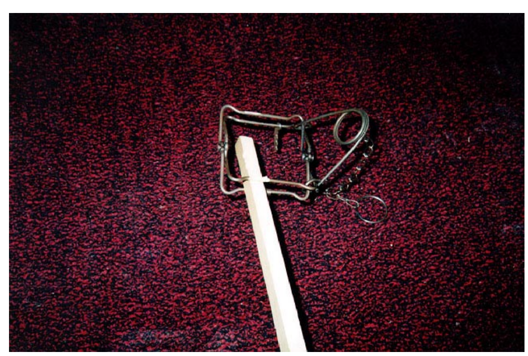
Large leg-hold trap: sprung

Leg-hold (foothold) traps are set with their jaws open at 180° and then they snap together straight up. They serve as a restraining trap for larger fur bearing animals such as red fox, coyote, or wolf. As a killing trap, however, the coil springs are often unable to produce enough energy to consistently render a marten unconscious within 3 minutes (not enough "potential energy" can be stored in a coil spring – see Lesson 5). Leg-hold traps are usually set under some bait or round scent marks, to catch an animal as it is snooping around. Leg-hold traps set underwater ("drowning sets") could render an animal unconscious more quickly, but tests on drowning sets have shown that some animals will still struggle underwater longer than 3 minutes. Proulx classifies leg-hold traps as conventional for most purposes. However, the Canadian General Standards Board classifies the size 1½ leg-hold trap as state-of-the-art. Besides companies also sell padded coil spring traps. These are considered more humane when restraining an animal.

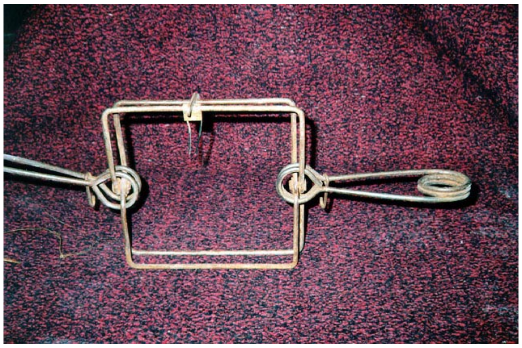
Conibear Traps



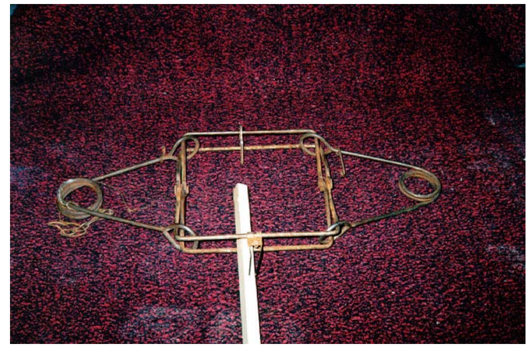
Small Conibear (size 120) trap: set



Small Conibear (size 120) trap: sprung

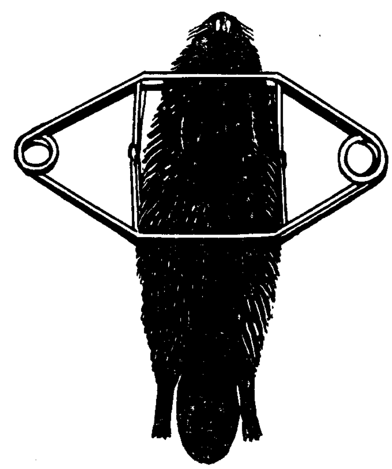


Large Conibear (size 330) trap: set



Large Conibear (size 330) trap: sprung

As shown in the photographs above, a Conibear trap is designed with two metal frames that rotate when set off, powered by one or two torsion springs. Figure 2 (next page) gives a few more details. A Conibear trap is sometimes called a body gripping trap because it grips the whole animal not just a leg, as shown in the diagram at the right. A Conibear is also known as a quick kill trap because animals are often rendered unconscious quickly when hit in a vulnerable spot (see Figure 3, p. 17) when the two metal frames snap closed (see Figure 4, p. 17).



A beaver trapped in a Conibear 330.
(Source: *Humane Trapping Methods*)

Of all the quick kill traps, the Conibear became the most popular conventional trap. Not only is it more humane than the leg-hold trap, it is more effective in many situations. Conibear traps can usually be set easier, there is less escape, and there is seldom any fur damage. They come in several sizes. State-of-the-art Conibear traps are listed in Table 1. The smallest Conibear, size 110, is not considered state-of-the-art by the Canadian General Standards Board, and so it does not appear in Table 1.

Table 1. Conibear Traps

Size	# of Springs	Suitable for Trapping
120	1	muskrat, mink, weasel, marten, skunk
160	1	racoon
220	2	fox, fisher, skunk, muskrat, racoon, marten
280	2	badger
330	2	beaver, otter, lynx, fox, wolverine

Compiled from *Humane Trapping Methods, Mammal Trapping,* and *Saskatchewan Trapper Training Manual.*

In order to use a Conibear trap successfully, you must attract an animal and get it to pass through the trap, or at least place its head or neck into the trap (to get at the bait you set). A number of different sets are shown on the pages 18-21, following Figure 4. See Appendix A for many more examples. Innovations to the design of a Conibear trap are discussed next, pages 22-23.

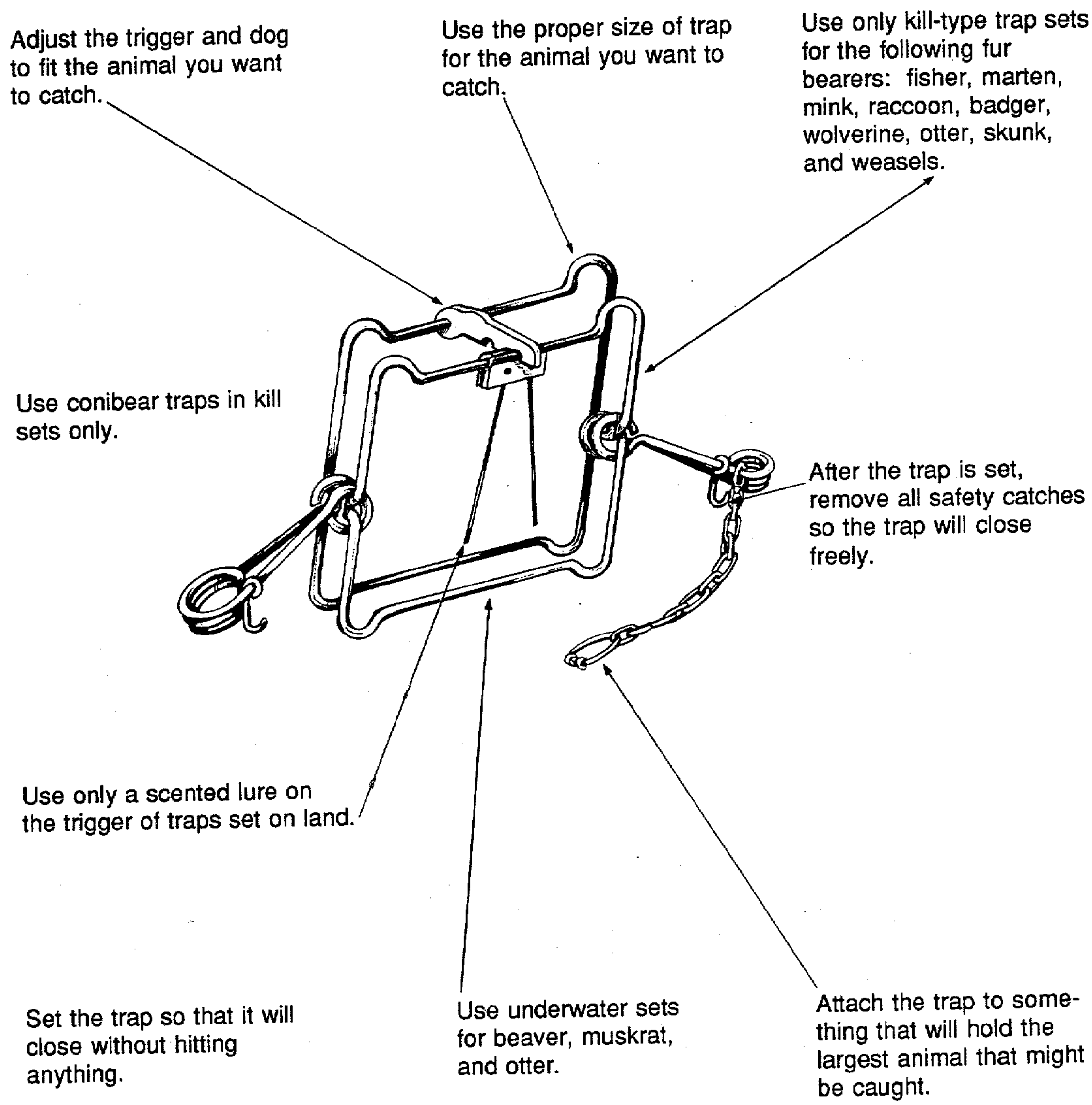
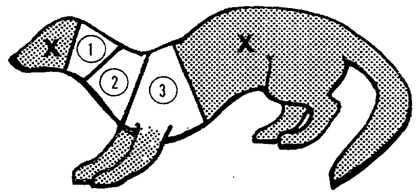


Figure 2. A Conibear trap with two torsion springs. (Source: *Saskatchewan Trapper Training Manual*)

For killing traps to be humane and effective, it is important that the jaws strike the animal from top and bottom in a vital location and with maximum striking and clamping force.



Strike Zone 1 animal becomes unconscious almost instantly and death is quick.

Strike Zone 2 rapid death but animal is less likely to be unconscious immediately.

Strike Zone 3 rapid death but animal is less likely to be immediately unconscious and chance that the animal may not stay unconscious.

Strike Zone X a slow death and inhumane capture.

The most humane strike area is the area just behind the ears to the upper rib cage. Every humane trapper should try and strike in zone 1. This way the full force of the strike kills the animal quickly.

Figure 3. Proper strike location (Source: *Saskatchewan Trapper Training Manual*)

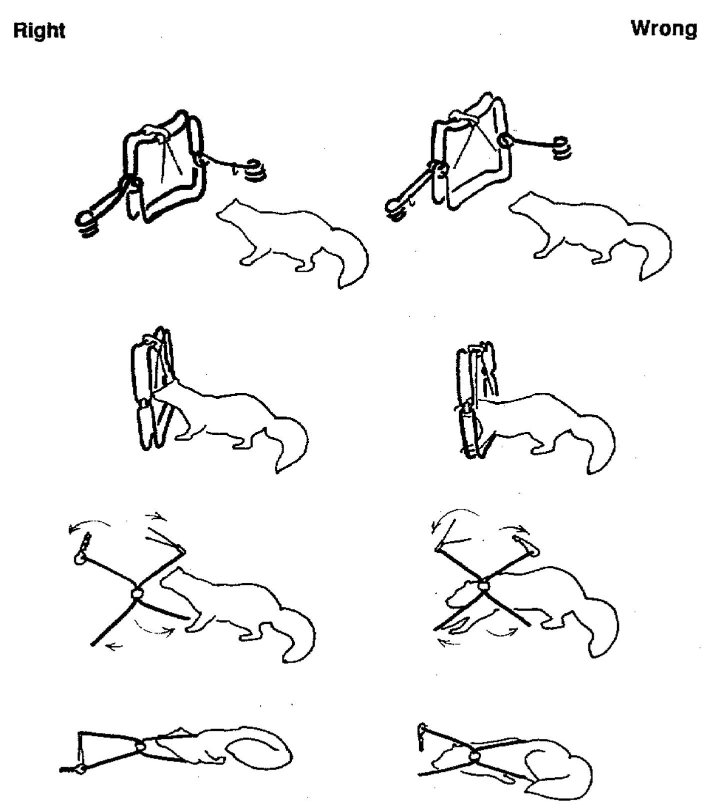
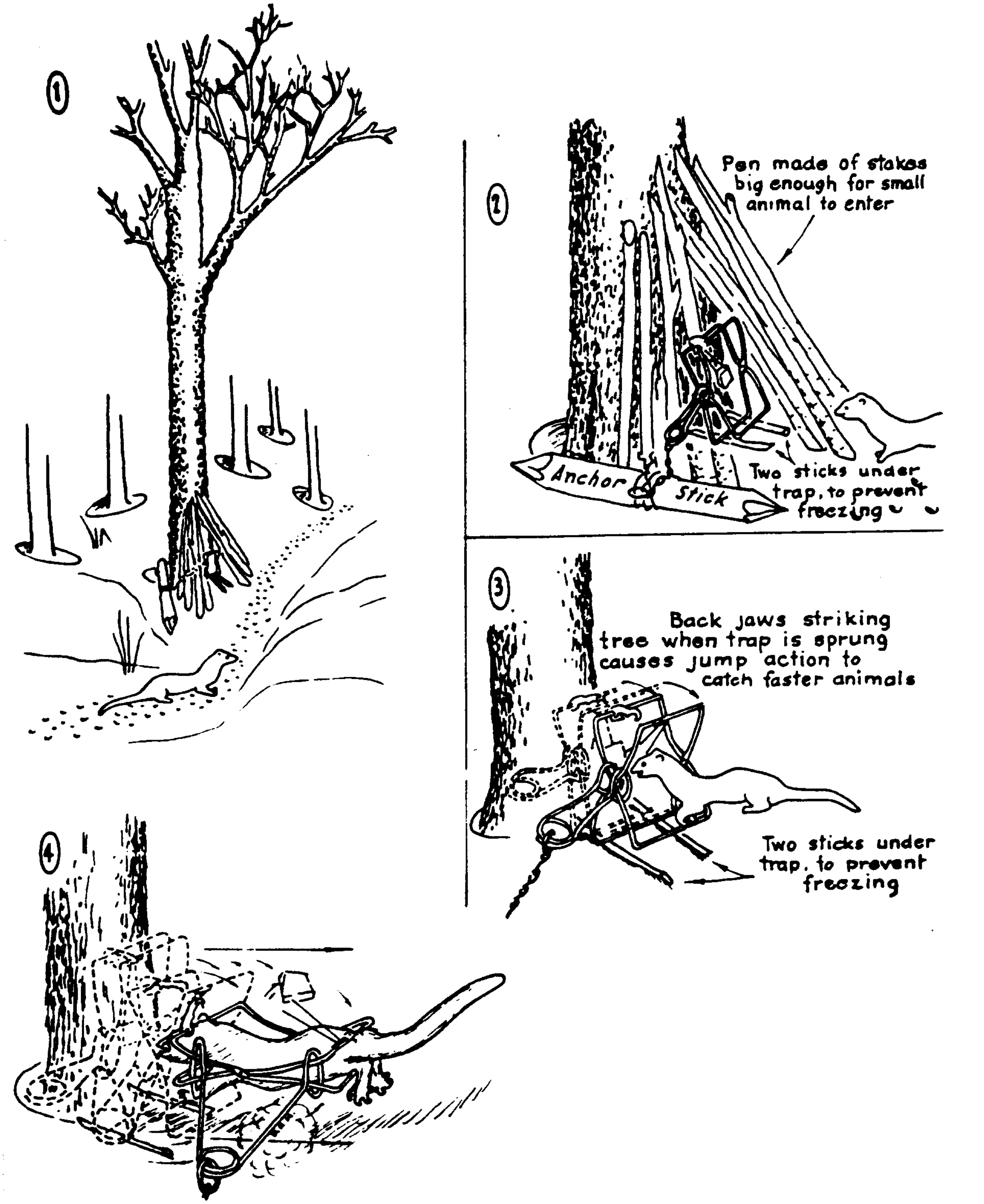
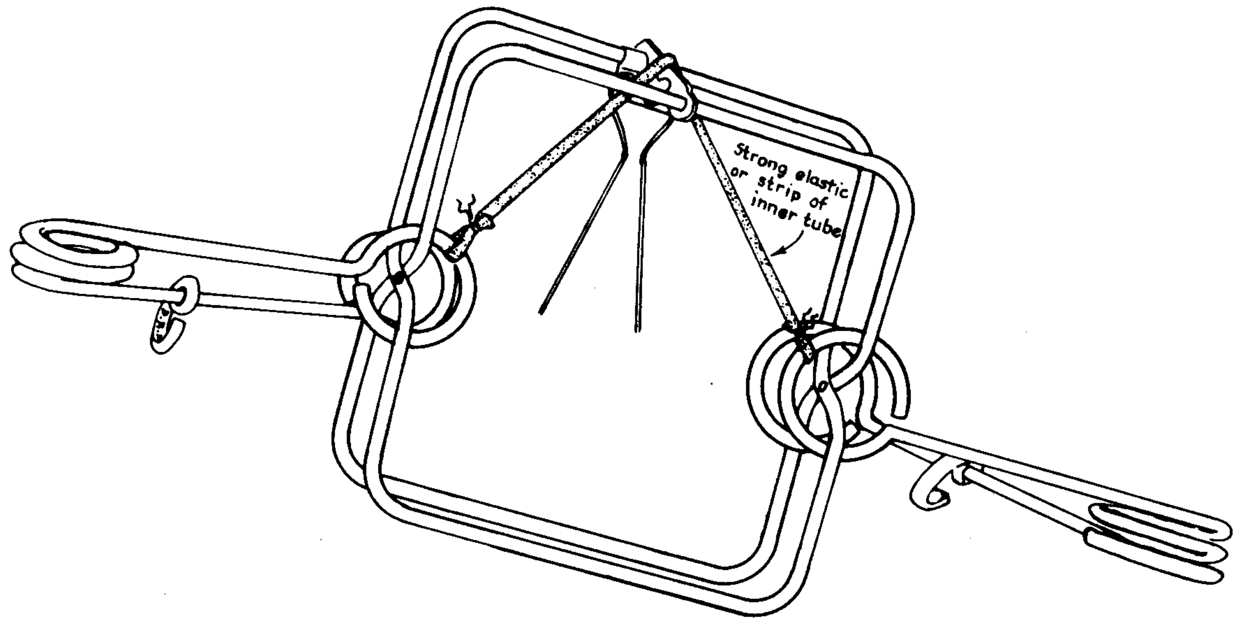


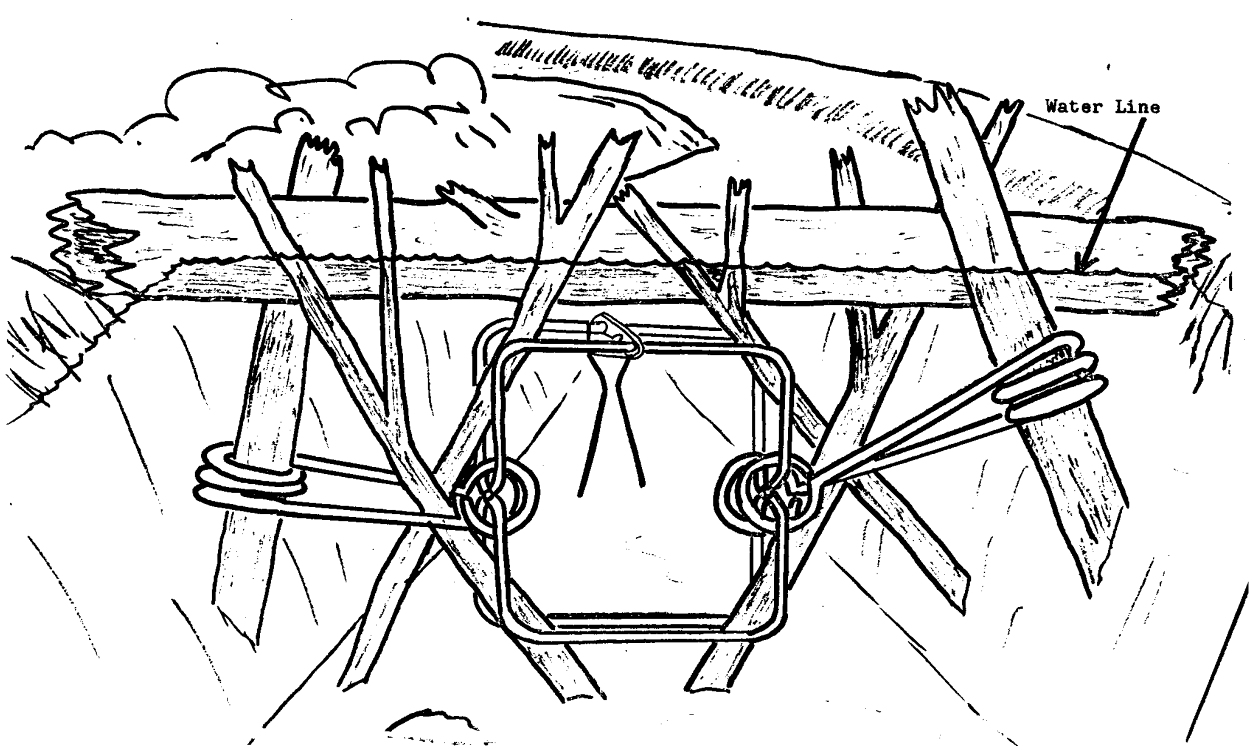
Figure 4. Humane vs non-humane (Source: *Saskatchewan Trapper Training Manual*)



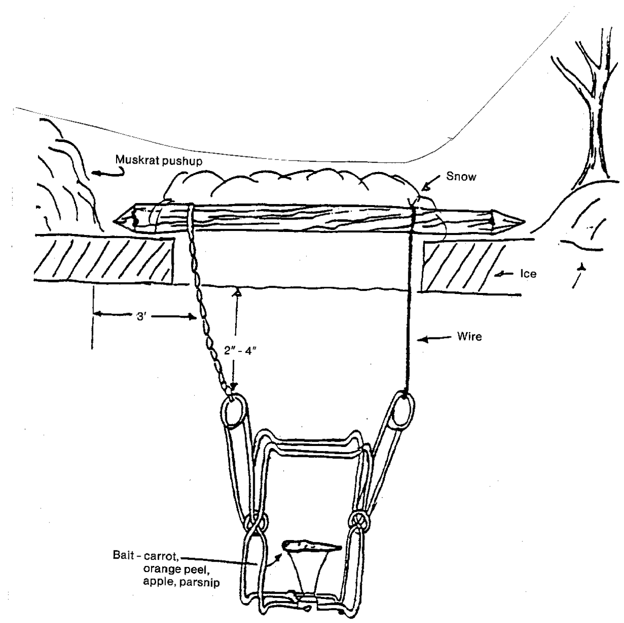
Conibear (120) Small Animal Jump Set. When making this type of set, choose a spot where the animal travels. To protect birds and other animals, a pen of poles sloping from the tree to the ground can be built, leaving an opening large enough for the intended catch. The trap can be baited with fish, rabbit, etc. (Source: *Humane Trapping Methods*.)



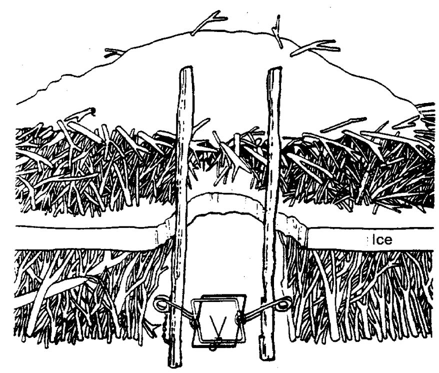
Conibear 330 Trap Trigger Adjustment. A strong elastic is tied to the trap hinges, then stretched tightly over the trigger dog. This will make it almost impossible for an unwanted small animal or the river current to spring the trap, but a beaver and otter will spring it. (Source: *Humane Trapping Methods*)



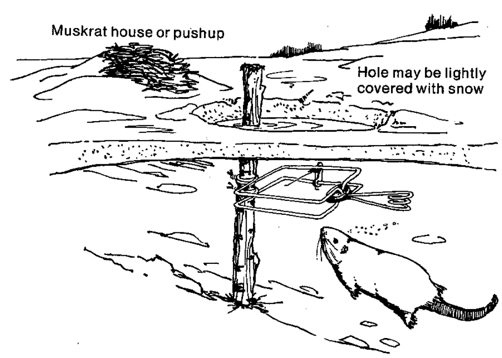
Conibear 330 Drowning Set for Beaver or Otter. The trap is placed *under water* in an open channel of water, attached under a log. The arrangement of the log and the sticks forces an animal to dive through the trap. (Source: *Humane Trapping Methods*)



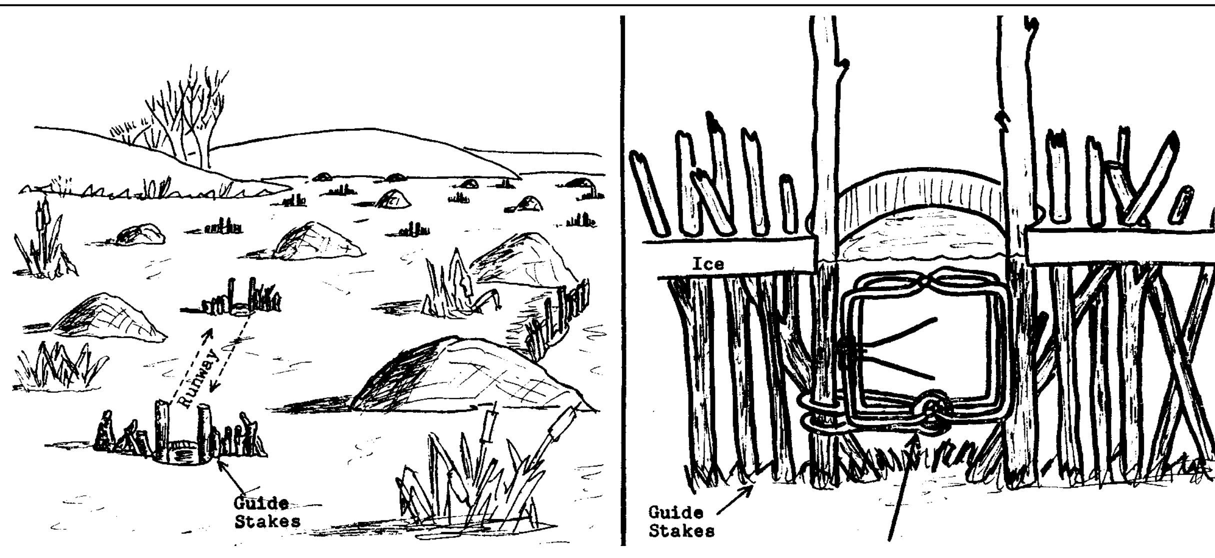
Baited Conibear Under Ice. A different size is used when trapping a beaver, otter, or muskrat. The bait (e.g. carrot) fits on the trigger. (Source: *Saskatchewan Trapper Education Manual*)



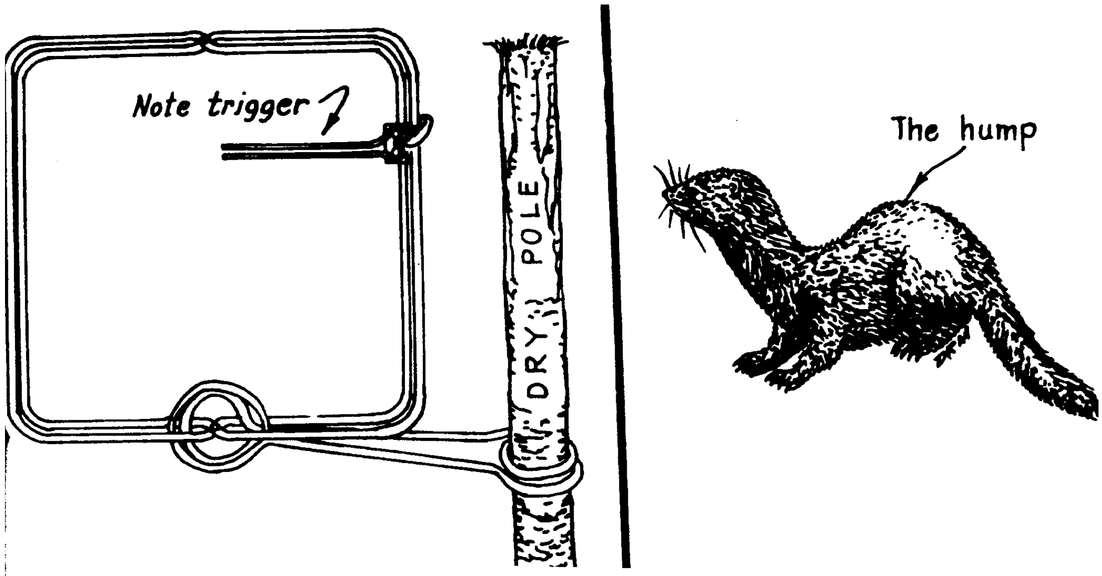
Under Water Set at Beaver Lodge. Trap is positioned in the bottom and centre of the entrance to the lodge. The trigger position at the bottom prevents pelt damage. (Source: *Saskatchewan Trapper Education Manual*)



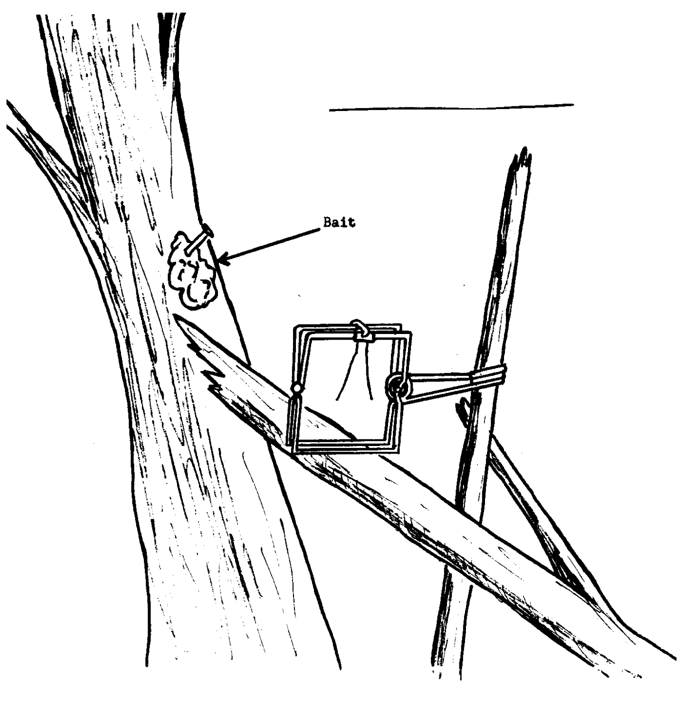
Under Water Muskrat Set. Small Conibear close to muskrat house. (Source: *Saskatchewan Trapper Education Manual*)



Muskrat Set. Conibear 120 set in established runways of the muskrat. (Source: *Humane Trapping Methods*)



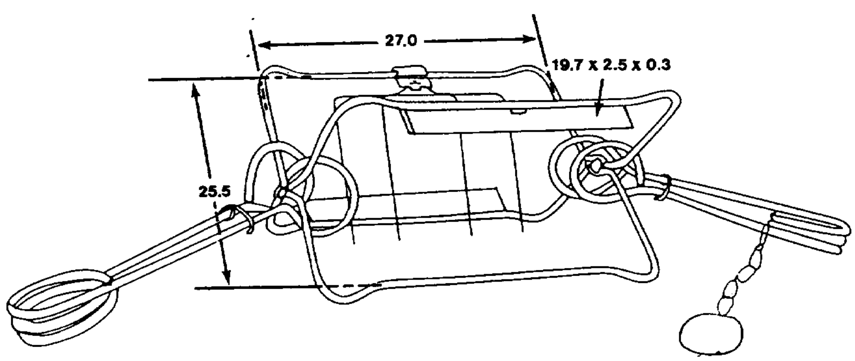
Conibear Trap for Mink. This method can be used for any mink set. The trigger position is higher than normal so it will be set off by the animal's hump on its back. Many mink do not like to push the trigger with their chest, and will avoid a normal trap. (Source: *Humane Trapping Methods*)



Running Pole Set. This set is effective for marten, fisher, squirrel, and other animals accustomed to hunting food in the trees. (Source: *Humane Trapping Methods*)

Design Innovations

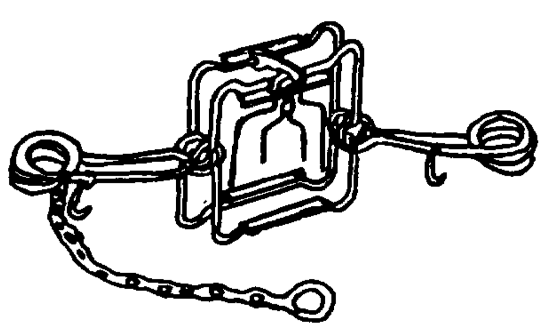
In Gilbert Proulx' assessment of Conibear traps (*Mammal Trapping*, pages 10-13), he concludes that size 120 does not consistently strike marten, mink, and muskrat at their vulnerable spots and so the animals do not always become unconscious within three minutes. This is due to the fact that there are (1) different sizes within the same type of animal, (2) different ways animals approach the trap, and (3) different trigger sensitivity for the same type of trap. Proulx came to similar conclusions about the Conibear 220, 280, and 330. However, by welding two clamping bars to the opposite ends of one of the two Conibear 330 frames, and by changing the trigger design to a 4-prong trigger (see diagram just below), Proulx modified the Conibear 330 so that it was more effective in rendering a greater percentage of beaver and lynx unconscious wothin 3 minutes. This occurs mostly because of the trap frame's greater striking energy – greater "kinetic energy" (Lesson 4).



Conibear 330 with clamping bars (dimensions are in centimetres)

With permission from Proulx, 1999.

Canadian companies, such as Les Piège du Québec, engage in *research and development* (a combination of science and technology) to improve the humaneness of traps. For instance, the Conibear trap was modified by adding an extra striking bar at each extremity on one of the two frames. This gave their "Sauvageau 2001" trap more kinetic energy, especially in the larger models.

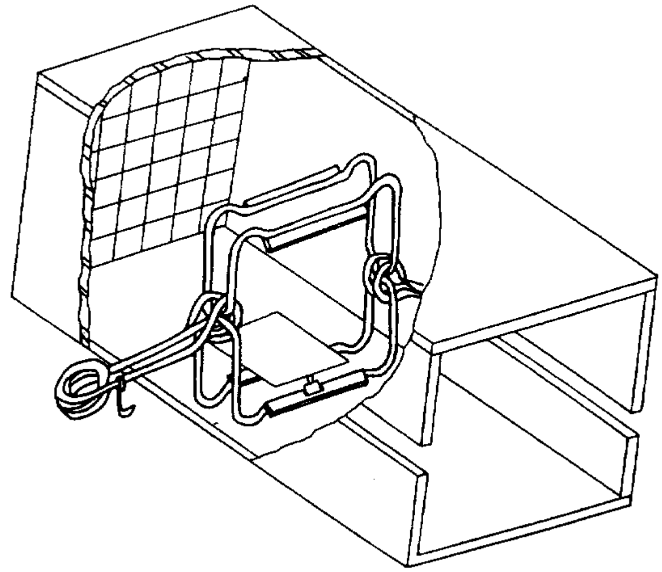


C120 Magnum with pitchfork trigger

With permission from Proulx, 1999.

Another improvement to the Conibear design is sold by Les Piège du Québec, the C120 Magnum trap. The trigger mechanism fires only when pushed in one direction, and it has a more complex ("pitchfork") design compared to the conventional Conibear's trigger mechanism. With these changes, along with specific details on where to place the bait in the set, a trapper can better control the approach and movement of an animal into the trap, thus increasing the effectiveness of rendering the animal unconscious within 3 minutes.

The trap's humaneness factor is improved, for instance, by placing the C120 Magnum in a box ("cubby box") and by using a pan (platform) trigger. Proulx recommends this trap for marten, mink, muskrat, and weasel.



C120 Magnum with pan trigger in a cubby box.

With permission from Proulx, 1999.

Summary

Many other trap designs are reported in Chapter 1 of Proulx' *Mammal Trapping*, such as the Kania and Bionic traps. Both are modifications of the mousetrap. Table 2 summarizes the traps that Proulx recommends using for animals found in the La Loche district.

Table 2. Recommended State-of-the-Art Traps

Animal	Killing Trap	Restraining Trap
beaver	Conibear 330 with clamping bars	
coyote		padded leg-hold, size 3
fisher	Bionic	
lynx	Conibear 330 with clamping bars	
marten	C120 Magnum, Kania 2000, Bionic	
mink	C120 Magnum, Bionic	
muskrat	C120 Magnum	
red fox		padded leg-hold, size 1½
squirrel	Kania 1000	
weasel	C120 Magnum, Bionic	
wolf	power snare	foot snare

Modified from Proulx (1999, p. 33)

Lesson 3: *Safety of Traps*

téhjuzi (mink)

Timing
½ class

Goals
1. To impress upon students the importance of the care and proper maintenance of tools and equipment.
2. To instill in students the sense to think ahead to avoid dangerous situations.

Objectives
1. Students will realize that a trap is a tool and must be respected as an important technology.
2. Students will develop a facility to handle traps safely.

Aboriginal Value to be Conveyed
respect for oneself and others by considering the consequences to your actions

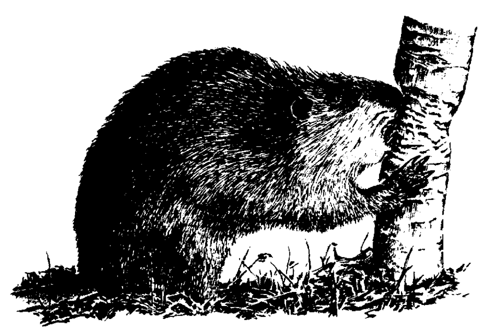
Instructional Strategies
experiential

Lesson Outline
1. Bring in various traps for viewing.
2. Go through the parts of the trap: spring, trigger, etc.
3. Demonstrate how to handle each type of trap safely. Have the class make their own class notes on this presentation. (One student could put notes on the board, dictated by the class.)
4. Set the traps for students. Set off the traps with a piece of wood. Don't let students get too close at this point. If there is a student who has some experience, let them repeat what you've demonstrated. (A #1 and a #1½ will pinch you fairly hard, but they don't usually break anything too seriously.

CELs / Subject Integration: technological literacy

Resources
various types of traps

Teacher Notes
- Make sure you practise demonstrating safety.
- Students do not at first make a logical connection between the risk at hand, and their own safety. They do not naturally anticipate what might happen. They must be taught to make that connection.



tsá (beaver)

Lesson 4: *Western Science Description of Traps – Part I*

Timing
2 to 3 classes

Goals
1. To construct the scientific ideas of kinetic energy and pressure.
2. To relate scientific terms and concepts to everyday knowledge.

Objectives
1. Students will be able to describe "striking force" (i.e. "kinetic energy" in Western science) and "impact force" (i.e. "pressure" in Western science) as applied to traps and as applied to other everyday events.
2. Students will be able to calculate the pressure involved in some everyday events.
3. Students will distinguish between commonsense language and Western science language, and will be able to know which one is being used at any given moment.

Scientific Value to be Conveyed
scientists invent ideas that explain a wide variety of events

Instructional Strategies
guided inquiry

Lesson Outline
1. Demonstration/discussion:
    a. Set a Conibear trap and let it trigger on a stick of soft wood. Repeat using styrofoam, a wiener or sausage, and a cleaned spare rib or chicken bone.
    b. Observe the marks left by the trap, and categorize the objects in order of depth of the marks made by the trap.
    c. Show the diagram of a small animal in a Conibear trap (e.g. diagrams in Lesson 2) and discuss how the iron railing (trap jaw) strikes a blow on the animal's head to quickly kill it. As the size of a Conibear trap increases, the striking energy increases. Compare the animal's head to the types of materials earlier observed in the trap (styrofoam, wiener, and bone). See if any student can replicate such a mark on their own hand, without hurting themselves.
2. In a dramatic fashion, introduce students to looking at the trap in a totally different way – from the viewpoint of Western science. Western science talks about objects and what they do, but not about *who* the objects are and what purpose they serve. (Perhaps move to a different place in the room or use a different black board to work on, to signify that the discussion has changed cultures.) In other words, cross the cultural border from the everyday world with its knowledge of traps to the world of abstract scientific ideas that have no particular context, a world preoccupied with matter, energy and the interaction between the two.
3. Western science: Consider object 1 (animal's head) and object 2 (iron trap jaw). Object 2 moves

towards object 1 and comes to a stop upon striking object 1. A scientist would say, "It takes a certain amount of *energy* to inflict the damage to object 1." But watch out, the scientific word "energy" has a different meaning than our everyday meaning. Scientific meanings are introduced here, in the form of stories from Western science.

a. A story of *energy of motion*:

In the culture of Western science, moving objects have a certain amount of energy of motion. The amount of this energy depends on how heavy an object is, and how fast the object is moving. For instance, a bigger Conibear trap, one with two springs, will have a heavier trap jaw (object 2 in the discussion above). The bigger the trap, the more energy of motion its trap jaw will have. Here's another example: a car travelling at 10 km/hr has more energy of motion than a student running at 10 km/hr. But consider two students weighing the same and both running down the hall, one running twice as fast as the other. The fast student will have more energy of motion than the slower student.

An engineer or rocket scientist might want to calculate this energy of motion. That's the protocol in this type of Western science. In their culture scientists call this energy of motion **kinetic energy**. Here is a math formula they would use:

$$\text{energy of motion} = \text{kinetic energy} = \tfrac{1}{2}(\text{mass})(\text{speed})^2$$

We won't be calculating the kinetic energy of a trap, so we won't be measuring the mass and speed of the trap jaw. But with other things we might need to calculate the kinetic energy of an object, and so the formula could be useful then. To have a little fun with some math, you could get students to calculate how fast a 60 kg student would have to run in order to have the *same* kinetic energy as a 4,000 kg car rolling slowly at 10 km/hr. Make sure you help students calculate the square root.

We'll return to the idea of kinetic energy in the next lesson, where we expand our thinking to include the idea of potential energy.

b. A story of *pressure*:

When one object strikes another object, some damage could happen. In the culture of Western science, they talk about a "force" of one object on a second object. The commonsense meaning of force is different from its scientific meaning. The Western scientific meaning of force is quite abstract because we rarely experience such a force in our everyday lives. Instead we experience force distributed *over a contact area*. For instance, the force on our skin from a blunt object (e.g. a pillow) feels quite differ than the *same* force from a sharp object (an object with much less contact area, such as a hockey puck). An engineer or scientist would express this experience mathematically as:

$$(\text{force of object 1 on object 2}) \div (\text{contact area of the two objects})$$

The experience we feel (when hit by a hockey puck) is something different than what scientists call a “force.” But our experience is directly related to such a force. In the everyday world we might say, “I got hurt by the force of the hockey puck.” But that is the everyday meaning of “force,” not the scientific meaning. If an engineer or scientist were hit by a puck and spoke in the culture of Western science, they would say, “I got hurt by the **pressure** of the hockey puck.” In Western science:

$$\text{pressure} = \frac{\text{force}}{\text{area of contact}}$$

Because a trap snaps shut so quickly, it is extremely difficult to measure its force directly. A creative solution to this problem in the culture of Western science is to measure the pressure *indirectly*. This is what the next activities is all about.

4. Activity: To Measure the Pressure Exerted by Various Traps

This is an excellent activity to get students to use scientific concepts in common everyday events and to solve technical problems. In summary, here is what happens: A limp balloon is fastened to a plastic pop bottle and then the bottle is placed in a set trap, which crushes the bottle forcing the balloon to expand, which can be measured with a tape measure. Think of it as an experiment in which the pressures of various traps can be compared. Possible manipulated variables are the size and type of trap; the responding variable is likely the diameter of the balloon; and there will be many controlled variables that students will have to pay attention to if they are going to compare the results of one trial with another trial.

- Use 1 litre or 2 litre plastic pop bottles.
- Add about a half a bottle of water. The needed amount of water is unpredictable at first, so you have to try it once to see what happens with your set-up (depends on size of pop bottle, size and type of trap). The more water you add, the more the balloon will expand.
- Duck tape around a deflated balloon pulled over the bottle opening.
- Set your trap, and carefully place the bottom end of the bottle on the trigger mechanism of the trap.
- Use a cloth tape measure to measure the circumference of the balloon.
- Get students to talk in the culture of Western science as they conduct this activity. You may want them to role play being scientists.
- Get students to conduct and write up the activity in the way you want them to (an experimental report, a consumer report, etc.).

For a highly eventfully variation, use a cork instead of a balloon and measure how far the cork flies. See the photos on the next page. NOTE: Do this out of doors!

Photo 1. Setting the trap.

Photo 2. Fixing the bottle.

Photo 3. The trap goes off.

Photo 4. Time to measure and compare pressures.

5. Activity (in groups, or as a class demo): To Calculate the Pressure of Some Familiar Things
   a. Get one student to volunteer to be weighed. Take their weight (bathroom scales), and figure out the contact area between their feet and the floor (e.g. use square cm graph paper). Calculate the pressure of the student on the floor when standing. By convention, the units of pressure should either be kg/m^2 or $gram/cm^2$. Recall that $1\ m^2 = 10{,}000\ cm^2$. This everyday event should give students a rough idea of the amount of pressure involved.
   b. Another related activity is to figure out the pressure of the same student wearing snowshoes. See Lesson 4 “Staying on Top of the Snow: A Scientific Point of View” in the unit *Asâmak*. (In that lesson, there is information on a more abstract unit for pressure – Pascals – if you wanted to be more advanced in your Western science.)
   c. Challenge students to figure out the pressure of other everyday things of interest to them (e.g. snowmobiles, bicycles, etc.). There are some ideas in *Asâmak*.
   d. Have students analyse these events in terms of students’ everyday knowledge, and then in terms of scientific knowledge (energy and pressure). Record their ideas and language, keeping their commonsense language separate from their scientific language (e.g. on a different black board).

6. Compare and contrast 2 ways of looking at the world (the everyday way and the scientific way), each way having a different language and a different way of thinking about the world.

CELs / Subject Integration: Math

Resources

Conibear trap, sausage, styrofoam, sparerib, soft wood (for step 1.a.)
materials for part 4: traps, plastic pop bottles, duck tape, round balloons, cloth tape measure (step 4)
bathroom weigh scale, square centimetre graph paper, calculators (step 5)

Teacher Notes

- Force, momentum, kinetic energy: In Gilbert Proulx’ book, *Mammal Trapping*, he measures a trap’s striking energy in “kg m/s.” Striking energy = (mass)x(velocity). In the culture of Western science, this is the concept of momentum. You will likely confuse students if you were to introduce the scientific concept of momentum here. Students will have difficulty distinguishing between momentum (mv) and energy ($\frac{1}{2}mv^2$). Kinetic energy is chosen for this unit (rather than momentum) because kinetic energy complements the concept of potential energy introduced in Lesson 5. There is another reason for our choice, based on research in science education. Students’ preconceptions of the idea that scientists call “force,” turns out to correspond to the concept scientists call “momentum.” In other words, in their commonsense world, students often say “force” where a scientist would say “momentum.” If you were to use Proulx’ momentum measurements, you would have to get students to distinguish not only between momentum and kinetic energy, but between momentum and force, all in the culture of Western science. I have tried to avoid making distinctions between abstract scientific concepts – force, momentum, kinetic energy – that are not really necessary for explaining the technology (structure and design) of traps.

Lesson 5: *Western Science Description of Traps – Part II*

Timing
1 class

Goals
1. To relate scientific terms and descriptions to everyday knowledge.
2. Science ideas are like useful stories.

Objectives
1. Students will be able to describe energy as taking one of several different forms: kinetic, heat, electrical, light, nuclear, sound, chemical, etc.)
2. Students will recognize that the physics idea called "conservation" is a cultural assumption in Western science (similar to a cultural myth); e.g. conservation of energy.
3. Students will be able to describe potential energy and relate it to kinetic energy.
4. Students will be able to design and carry out a scientific experiment to test the pressure of different traps.

Scientific Value to be Conveyed
scientific knowledge is built upon unproven assumptions
scientific knowledge is built out of creative abstract ideas

Instructional Strategies
direct

Lesson Outline
1. In a story telling format, introduce students to the following Western science beliefs (legends?):
    a. Energy can express itself in many different ways, such as kinetic energy, heat energy, electrical energy, light energy, nuclear energy, sound energy, chemical energy, etc. In the culture of science these different ways are called *forms of energy*.
    b. Especially with the help of technology, you can change one form of energy into another form (e.g. an electric stove changes electrical energy into heat and light energy). Get students to add to this list. In the culture of science this is called the *transformation of energy*.
    c. The total amount of energy in the universe is always the same, it does not disappear and it does not suddenly appear from nowhere, but it can change its form. In the culture of science this assumption (belief, myth?) is called the *conservation of energy*. Again the word "conservation" has a completely different meaning in the culture of physics and chemistry than it does in our everyday culture. In the commonsense world, if we "conserve" something we do *not* waste it. In Western science, when we conserve energy we keep track of what is wasted. We do this by noting the various forms it is transformed into. On the other hand, in the commonsense world, these same forms of transformed energy give us the feeling that energy has disappeared).

Background Information for Part 1:
There are lessons to learn from the history of science. Between 1750 and 1850, scientists Black and Rumford argued whether or not heat was conserved. When Rumford demonstrated that it was not conserved, other scientists (Joule and Mayer) invented the concept of energy in about 1850. According to them, energy was conserved (not heat). This is the idea we're using in this lesson – the conservation of energy. However in the 1940's, energy was not conserved during a nuclear fission reaction. In response to this contradiction, scientists invented another concept that would be conserved. Scientists used Einstein's ideas and said that *mass-energy* is conserved. As in any culture, some beliefs change for very good reasons, like the physicist's belief in conservation. When viewed by someone from outside the culture of physics, a fundamental assumption such as conservation may seem like a myth. The conservation of energy (or mass-energy) is as important to the culture of Western science as Changing Woman is to some First Nations peoples.

2. Demonstrations/discussion:
   a. Compress a spring in such a way that when you release it, it causes a ball to roll across the top of a table. Interpret the event in a humourous commonsense way, and then introduce students to the following interpretation found in the culture of science.
      The moving ball has a certain amount of energy of motion (kinetic energy). Where did that energy come from? Using the law of conservation on energy, we assume that the energy was not created out of nothing. It must have come from the compressed spring. Thus, we imagine that the compressed spring has energy somehow stored in it, and that energy can be transformed into kinetic energy. This seemingly invisible energy somehow stored in the compressed spring was given a name in the culture of science – **potential energy** – energy that has the potential to be transformed into a noticeable form of energy. If you like, you can play the game of following the energy transformations all the way to its source. For instance, the energy to compress the spring in the first place came from your muscles (vital energy?). Your muscles got this energy from the salad you ate. The plants that comprised the salad got their energy from the sun. You might wish to stop there, but you don't have to. The sun gets its energy from its nuclear fusion reactions. The energy in nuclear fusion reactions comes from ... (and eventually we hit a wall of mystery in the culture of science).
   b. Turn on a flashlight. Get student to play in the culture of science by taking on the roll of a scientist. Get students to imagine a scientific story that describes where the energy was stored in the flashlight, that is, the energy that is transformed into electrical energy and then into light energy and heat energy. (One answer: the electric potential – the voltage – is stored in the chemicals in the battery. The potential energy is in the form of chemical energy. Students may have other reasonable ideas. Accept what is sensible within the culture of science. Gremlins and spirits are not allowed in science stories.)
   c. Drop a ball. Get students to roll play scientists by describing what happened with the ball, in terms of its kinetic and potential energy. In this case, the storage of potential energy is more abstract than in a spring or battery – it's stored by the *position* of the ball with respect to the gravitational pull of the earth. Potential energy is often relative to something else. It's seldom an absolute amount. For instance, someone standing on their desk has a certain amount of potential energy *compared to* the floor; and this is different when compared with the ground outside the school. Ideas in the culture of science are abstract like this. But students can play with these ideas by making up reasonable science stories, and by explaining everyday events in

terms of basic scientific ideas.

3. Closure. Bring out a Conibear trap and a stick. As you set the trap, get the class to describe *in the culture of science* what you're doing. When the stick sets the trap off, get students to describe *in the culture of science* what happened. Encourage them to use as many ideas from Lessons 4 and 5 as they can.

CELs / Subject Integration: communication

Resources
photos depicting different forms of energy (don't confuse the technology with the form of energy);
a spring you can compress, a ball;
flashlight, batteries;
trap and stick.

Teacher Notes
- Use as many visuals as you can to show students various forms of energy.

chízë (lynx)

nuniëtsëlë (coyote)

nąbië (otter)

Lesson 6: *Why Catch Animals?*

Timing
3 classes (library and community research, and class discussions)

Goals
1. To increase a student's understanding of technology and the political/social/economic forces of change in today's world, such as the whims of the market on a resource-based industry.
2. To show students that trapping, fishing, and hunting are no longer viable industries for employment for most people, and so other occupations must be pursued. This positions education (access to those occupations) as central to students' well being and in their best interest. (However, trapping and other seasonal occupations such as wild rice harvesting, might be combined to make a living.)

Objectives
1. Students will construct various causes and effects associated with economics and politics in the fur trade industry.
2. Students will realize that trapping is no longer a sustainable industry in the north today. Trappers today do it for recreation rather than for a living (as people did before).

Aboriginal Value to be Conveyed
care of Mother Earth

Instructional Strategies
individual, student-centred class discussion

Lesson Outline
1. Class researches how much fur was bought in a particular area, for a specific period of time.
2. Find the population growth of the same area.
3. Find the trends of fur prices over the years. Chart this information.
4. Have students talk about the comparisons between points 2 and 3. Students should notice the following trends:
   a. as the population increases, the population of fur bearing animals decreases.
   b. as the fur prices drop, the number of furs sold drops.
   c. As the human population increases, the animal population decreases.
5. Get students to think about how difficult it is for someone to make a living trapping in their community today.
6. Compare the trapping industry with the hunting and fishing industries, in terms of a sustainable and economically feasible industry. In this context, introduce the importance of education to students as an alternative path for their future lives – long term employment.

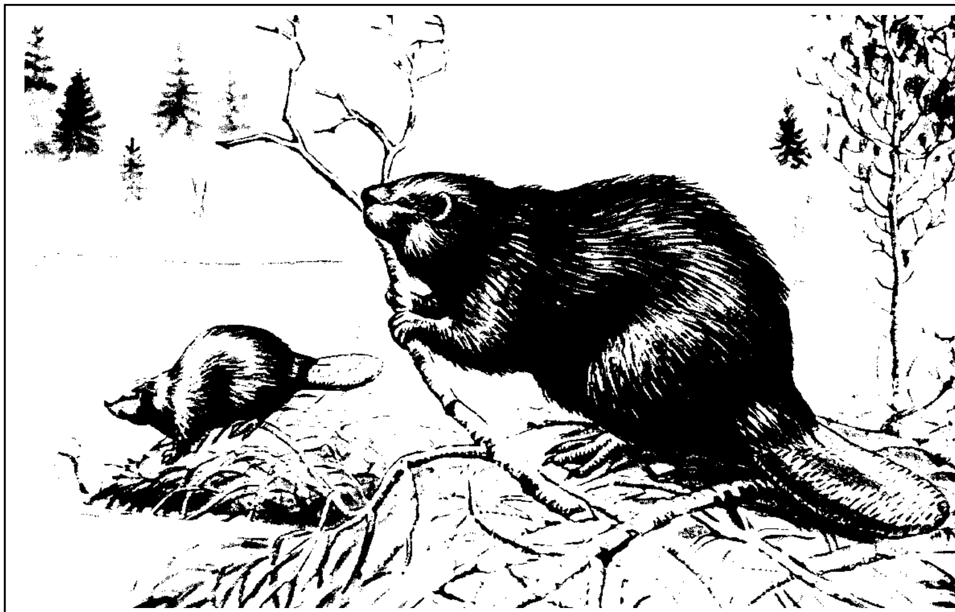
CELs / Subject Integration: technological literacy, Social Studies

Resources
Northern Stores,
independent fur buyer,
"A Brief History of Traps" in the Background section to this unit

Teacher Notes
- Fur markets in Winnipeg, Vancouver, etc. have the number of animals trapped and prices going back many years.

dzën (muskrat)

tha (marten)



tsá (beaver)

Lesson 7: *On a Trap Line*

nuiëtsëlë (coyote)

Timing
1 afternoon

Goal
Students will experience a real trap line.

Objectives
1. Students will discover the extensive hard work it takes to maintain a trap line and to realize the end product of furs.
2. (Optional) Students will identify some scientific families of fur bearing animals.

Aboriginal Value to be Conveyed
gifts are provided by Mother Earth

Instructional Strategies
experiential

Lesson Outline
1. Take students on a field trip to an actual trap line. If trap lines are inaccessible, or the season is not right, set up rabbit and/or squirrel snare lines. Skin and stretch your catch. Be sure snares are picked up when you're done.

CELs / Subject Integration: technological literacy, Social Studies

Resources
A local trapper who is willing to act as a student guide.

Permission slips for the field trip.

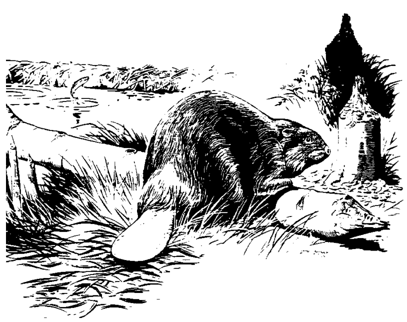
Teacher Notes

- Make all arrangements for a field trip well ahead of time: contacting a trapper, getting permission to have the field trip, ensuring adequate transportation, and getting sufficient adult supervisors to help out.

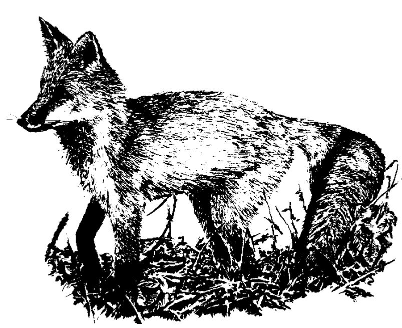
- Western Science Background for Lesson 7 (optional):

Table 3. Family Classifications

Western Family Group	Western Scientific Name	Animals that Belong to the Group
Beaver	Castoridae	beaver
Weasel	Musteldae	weasels, mink, otter, marten, fisher, skunk, wolverine
Dog	Canidae	red fox, swift fox, coyote, gray wolf
Mice	Cricetidae	muskrat, meadow mouse, deer mouse
Squirrel	Sciuridae	red squirrel, chipmunk, gofer, flying squirrel
Cat	Felidae	lynx
Rabbit	Leporidae	bush rabbit, snowshoe hare, jack rabbit
Raccoon	Procyonidae	raccoon

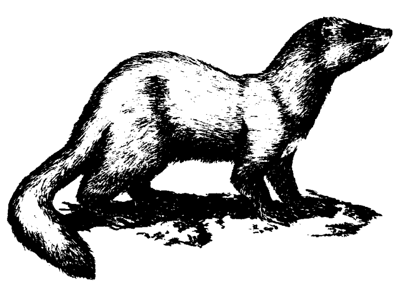


Castoridae



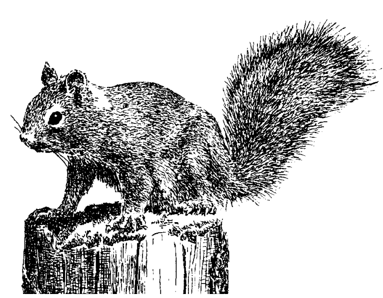
Canidae

Felidae



Musteldae

Procyonidae



Sciuridae

- Cross-cultural issues:

WARNING: The scientific model of classification represented in Table 3 is predicated on a Linnean worldview – a traditional story from Western science dating back to Carl von Linnaeus (about 1750). On the other hand, keepers of the animals (knowledge that is indigenous to First Nations science in your community) are predicated on a much different worldview that dates back thousands of years. Animal stories told by Elders contain abstract conceptualizations about animal behaviour. These symbolic abstractions have greater validity for survival in the land than the Western science textbook conceptualizations summarized by Table 3. Some Western scientists are learning more about nature by listening to the stories of Elders. This new field of investigation is often called "traditional ecological knowledge" (Corsiglia and Snively, 1995).

On the surface, we think we have correctly translated, for example, *Canis lupis* correctly into Dëne when we say nunië. But we may have ignored the cultural knowledge associated with those terms. For instance, *Canis lupis* answers the question, "*What* is that animal?" and the answer is embedded in a Linnean worldview. On the other hand, nunië answers the question, "*Who* is that animal?" and the answer is embedded in a Dëne worldview. The questions we ask determine the kind of answers we get. Therefore, different kinds of questions lead to different kinds of knowledge. Questions traditionally posed by Western scientists necessarily lead to knowledge that differs from Aboriginal knowledge of animals.

In other circumstances, Western science knowledge may be more useful to use. When students learn both knowledge systems, they have advantages over people who only know one. They can walk in both worlds. And when people synthesize both knowledge systems into one field of knowledge, they have traditional ecological knowledge.

Lesson 8: *Extensions*

Timing
distributed over a period of time

Goal
To get students to gain more details about trapping and life on a trap line, through reading, thinking about, and communicating their thoughts. (Novel study.)

Objectives
1. Students will read at least part of a novel (fiction or non-fiction) related to trapping.
2. Students will write a personal analysis of his/her reading, using a written guide for how to discuss a novel. Alternative moods to written expression should be negotiated; e.g. artful expressions, play readings of student composed plays.

Aboriginal Value to be Conveyed
respect of Mother Earth

Instructional Strategies
indirect

Lesson Outline
1. Present students with a variety of reading sources, and negotiate a contract for what they will read and think about.

2. Let students know your assessment system for marking their written discussion. Consider student self-evaluation and peer evaluation. Be open to many different ways that students might best communicate their thinking (media,

CELs / Subject Integration: Language Arts

Resources
Tetso, John, (1970). *Trapping Is My Life*.
Karras, A. L (1970). *North to Cree Lake.*
Karras, A. L. (1975). *Face the North Wind*.

Teacher Notes

- Alternatives to a novel study might involve:
  a. interviewing experienced trappers and presenting this work to the class, school, or community.
  b. doing a movie review on *Grey Owl* and other movies.
  c. taking pictures or tape recording as an experienced trapper describes the use of traps.
  d. making a "*How to ...*" booklet.
  e. doing a math study of trapping (area, population of people, population of animals). This is an extension of Lesson 6, for students who speak math fluently.
  f. learning about skinning and curing hides, and making a presentation to the class.
  g. designing clothes or other objects made of hides (or other worthwhile art projects)

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Appendix A

Saskatchewan Trapper Training Manual

Saskatchewan Education (Northern Division)

This 91-page document has been stored electronically for your convenience in a PDF file on the *Rekindling Traditions* CD, and on the internet at http://capes.usask.ca/ccstu.