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Samuel B. Linhart

Denver Wildlife Research Center, U.S. Fish and Wildlife Service, Denver, Co

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FURBEARER MANAGEMENT AND THE STEEL FOOTHOLD TRAP

Samuel B. Linhart, Denver Wildlife Research Center, U.S. Fish and Wildlife Service, Building 16, Denver Federal Center, P.O. Box 25266, Denver, CO 80225-0266.

Introduction

The trapping of furbearers, particularly with steel foothold traps, has become more and more controversial. The controversy is significant because the steel trap is considered the most versatile of the various methods available for capturing furbearers (Payne 1980). Whether traps are used to reduce livestock losses by predators or to harvest furs, the controversy has gained the attention and interest of various social factions, each with differing beliefs, attitudes, and philosophies.

Opposition to traps and furbearer trapping has increased concurrent with human population growth, urbanization, intensified land utilization, and reduced individual involvement in the production of food, clothing, and other essentials required by society (Manthorpe 1979, Wade and Beasom 1979, Gentile 1983, Herscovici 1985). Movies and television programs that present unrealistic and anthropomorphic wildlife themes have also encouraged emotional and humanistic philosophies and attitudes toward wildlife. According to Howard (1984), insulation and isolation from environmental realities has resulted in ". . . the development of an ecologically illiterate population which mingles management decisioning with political expediency and the proliferation of well-intentioned, intuitively pleasing, and ecologically indefensible legislation, regulation, and policy." O'Gara (1982) wrote that special interest groups commonly disagree but often reach partially satisfactory compromises. However, this is seldom true about the predator damage control issue where traps are a primary technique for reducing losses. Regarding the predation issue, O'Gara (1982) states ". . . polarization and confrontation are far more common than compromise and cooperation." Increased leisure time and more participation by the public in outdoor activities has also exacerbated the controversy. According to Alcock (1984), 1 of every 8 dollars is spent on outdoor recreation in the United States and the demand for recreation is expected to double by the year 2020 (Tomlinson 1985).

Herscovici (1985) asserted that conservation philosophy in the United States has long been divided between those favoring a "no-use" and those advocating a "wise-use" utilitarian attitude. He also stated that the word "ecology" was first used in 1866 by a German naturalist, but the meaning of the term had little impact on the layman until 1962 when Rachel Carlson's book, *Silent Spring*, was published. *Silent Spring* marked the beginning of the "modern" era of public concern over environmental issues with a concurrent proliferation and growth of animal welfare and animal rights organizations opposed to traps and trapping. An understanding of the evolution of such groups, their attitudes, and those having a "no-use" philosophy helps clarify the basis for opposition to trapping as a furbearer management technique.

Chapman and Pursley (1981) aptly pointed out that many furbearers now occupy environments altered by man and that such modified environments have changed both the distribution and densities of many furbearers. A "no-use" policy thus seems inappropriate as wildlife managers strive to achieve a balance between the economic and aesthetic values associated with furbearers and their management.

Although management of resident wildlife species is a state responsibility, the Federal Government also plays a role. The U.S. Fish and Wildlife Service (USFWS), in addition to administering

programs for the control of predators causing economic losses, also manages furbearers on more than 88 million acres of Federal land, mostly on the 404 National Wildlife Refuges and the 141 waterfowl production units (Baldacchino 1981). The regulated harvest of furbearers on these lands constitutes an important resource for which the USFWS shares responsibility with state wildlife agencies.

Because the USFWS considers trapping an important and legitimate management technique (Jantzen 1982), the Service's Denver Wildlife Research Center (DWRC), looking for ways to make traps more selective and less injurious and stressful to captured animals, has conducted trap research since about 1975 (Linhart et al. 1981, Turkowski et al. 1984). Although the DWRC orients trap research toward predator damage control, traps are widely used for other reasons such as subsistence, recreation, fur harvest, population regulation or restoration, wildlife research, disease control, community or ecosystem management and endangered species protection. However, trapping opponents seldom make distinctions among the different trap uses.

Using all the preceding information as the framework for considering the relationship between furbearer management and the steel leghold trap, we are now ready to examine the history of traps and trapping, present-day public attitudes toward animals and trapping, opposition and advocacy organizations plus related legislation, trap technology and research, and trap and furbearer management recommendations.

History of Traps

The spring trap has a long lineage. According to Dannenfeldt (1982), spring traps for larger mammals such as fox and otter were first described in a 1590 book by an Englishman, Leonard Mascall, who illustrated more than 30 mechanical devices. Mascall (1590) also described the use of galbanum (a plant) and the severed "privy parts of a female fox" as means of attracting red foxes to snares or hunters. Mascall estimated that foxes killed 10,000 lambs, 20,000 poultry, and 40,000 rabbits and conies, besides many fawns in England (Dannenfeldt 1982) - - - perhaps the first recorded predator damage survey! Russell (1967) stated that the double-spring trap illustrated by Mascall was, ". . . quite advanced mechanically and rather belies the idea that it is in a beginning stage of development. As one studies its parts, the notion is inescapable that many traps have preceded this one." He suggested that such traps probably existed long before the 1500's.

Russell (1967) further mentioned that the first steel traps were probably brought to the new world by the very first colonists who settled in Nova Scotia, along the St. Lawrence River, and the Atlantic Coast and used them for controlling depredating animals and for acquiring furs. Such traps and variations thereof were later made locally by blacksmiths for colonial use. From 1825 to 1848, Samuel Newhouse made some 1,000-2,000 traps per year; and from 1860 to 1868, while in the Oneida Community of New York, he mass-produced about 750,000 traps. Between 1874 and the early 1900's many trap manufacturing companies were formed, merged, or bought out. By the late 1930's most had been acquired by the Animal Trap Company, renamed the bloodstream Corporation in 1966. In 1983 bloodstream made about 950 of all the steel spring animal traps used in the United States (Snetsinger 1983).

Since the turn of the century, many changes occurred in public attitudes and furbearer utilization and management. Concern over earlier excessive furbearer exploitation and deteriorating habitat led to initiating trapping seasons, the licensing of trappers, and other regulatory actions by state wildlife agencies (Hubert 1982). The 1930's brought establishment of annual harvest surveys followed by reintroductions, propagation and release programs,

and census efforts (Hubert 1982). Long-haired furs again became fashionable in the 1970's and with increased harvest and fur sales came the need for furbearer management programs (Fritzell and Johnson 1982). According to Sanderson (1982), "Interest in furbearers increased rapidly in the 1970's with dramatic increases in pelt prices, an increased awareness of the values of all wildlife, endangered species legislation, increased demands for outdoor recreation, and the development of antihunting and **antitrapping sentiment.**"

Human Demography and Attitudes Toward Trapping

The worldwide human population is now 54% larger than in 1960, and the U.S. population is by no means excluded from this trend (U.S. Bureau of the Census 1983x). From only 4 million in 1790, the U.S. population had increased to 76 million by the end of the 19th century (U.S. Bureau of the Census 1983b). The 1984 census of the U.S. farm population showed that only 2.496 of the population lived on farms as compared to over 300 in 1920 (U.S. Bureau of the Census and U.S. Economic Research Service 1985). The significant movement away from the farm obviously means that we are evolving into a highly urbanized society. In 1980, nearly 7596 of the U.S. population was considered as living in urban areas (U.S. Bureau of the Census 1983b). Decisions on wildlife matters are therefore being made more and more frequently by urban dwellers. According to Deems and Parsley (1983), "In too many cases, an individual's knowledge of wildlife and the natural environment has been gleaned from staged and scripted wildlife movies and television programs. The programs are always colorful and entertaining, but seldom objective and educational" Gentile (1983) studied the relationship between anti-trap sentiment and human population densities in 3 states (Massachusetts, Ohio, Oregon) where anti-trap referendums occurred. His analysis showed that, in most cases, there was a positive relationship between high population density, opposition to trapping, and anti-trap actions. He also found that where income was derived from primary resources, support for trapping was strong; whereas support for trapping decreased where employment was primarily in the tertiary or service-oriented section of the economy.

Several public attitude surveys have been conducted in recent years to assess perceptions and viewpoints toward wildlife and predator control. These provided insight into how the public views wildlife in general and traps and trapping in particular. A nationwide telephone survey (Arthur 1981, Arthur et al. 1977) in 1976 found that 56% of the interviewees had not heard of the livestock producer-environmentalist controversy over coyote control. Trapping and slow poisons were considered the least humane methods of control. Forty-five percent of the people disapproved of legal game hunting and 61% said that they did not like cattle, hogs, and sheep to be killed for human consumption. Respondents were more concerned about humaneness and the selectivity of control techniques than about cost effectiveness.

S. R Kellert conducted a series of studies in the mid- 1970's and early 1980's to assess public attitudes toward domestic animals and wildlife (Kellert 1979, 1980, Kellert and Berry 1980, Kellert and Westervelt 1981, 1983). Of the first 3 studies, Byford and Munsey (1984) stated that Kellert's data showed ". . . most Americans know relatively little about animals. Most see wild animals only on television or in zoos, and most interactions with animals are with pets. Reflective of this, the attitudes of most of the American public were, to a great degree, based on unrealistic ideas about how animals actually live in their daily struggles for survival." Boggess (1982), commenting on Kellert's (1978)-results says that, "Demographically, antihunters included a disproportionately large number of females, were more likely to reside in urban areas, had less experience raising animals, and scored among the lowest on knowledge of animals of any group studied."

Also reflective of an urbanized public were children's responses (Kellert and Westervelt 1983) to such statements as, "It's OK to kill an animal and use its fur to make a coat" (7096 disagreed); "Hunting animals for fun" (84,296 disapproved); and "Would it be better if animals didn't kill other animals and ate plants instead?" (42,696 said yes). Of the general public participation in 46 selected animal-related activities within 2 years before survey, only 0.796 trapped compared to 3.796 who hunted, 11.396 who belonged to an animal-related conservation organization. 34.0% who were opposed to hunting, and 78.0% who watched the TV show, "Wild Kingdom" (Kellert 1980). The Kellert surveys also found that 7896 of a national sample disagreed with the statement, "I see nothing wrong with the use of steel traps to capture wild animals" (Kellert 1981).

Gentile (1983), examined the evolution and geographic aspects of the anti-trapping movement in great detail and summarized pro- and anti-trapping attitudes into 3 categories: humaneness, human benefits, and wildlife management needs. Those against trapping said that foothold traps injure animals, they inflict pain and suffering, animals are left to suffer in traps, traps are not selective, nontarget animals are killed, more humane traps are available and substitutes for fur products exist. They also said that trapping constitutes exploitation, recreation need not include cruelty, trapping provides only limited income, proof of trapping to control diseases is lacking, and that many nonlethal alternatives to the trap for controlling wildlife damage exist. The anti-trap proponents further argued that natural population controls exist, trapping only results in improved habitat for selected species but works against others, that wildlife management policy regarding trap use is biased, and trapping to scientifically manage a renewable resource is a philosophy, not a science.

Pro-trapping elements countered the above arguments by stating that trap-caused injuries are limited and minor, trapped animals do not experience pain or suffering as do humans and so natural deaths may be less humane, animals aren't left in traps very long because traps must be checked as required by law, trapping by persons with experience is selective, nontarget animals are released, alternate trams are unsuitable and fur is a renewable resource. Those favoring trapping said it is a proud heritage, a source of outdoor recreation and income, and it reduces disease, livestock predation, and damage to agriculture. They also believed that trapping can manage population levels, reduces habitat destruction and maintains healthy populations, is an essential management tool, is a scientific management technique and is directed at a renewable resource (Gentile 1983).

Surveys to determine behavioral profiles, characteristics, and attitudes of trappers at national and regional levels were the subject of a session at the 1980 Worldwide Furbearer Conference (Bailey 1981, Boddicker 1981, Kellert 1981, Marshall 1981, Penkala 1981, Samuel and Bammel 1981, Todd 1981). Knowledge and insight gained from such surveys aid greatly in understanding the complex issues of furbearer management and public attitudes toward trapping.

Anti-Trap Activities and Legislation

Several recent publications have summarized the evolution of the anti-trap movement (Deems and Pursley 1983, Gentile 1983, Eltringham 1984, Herscovici 1985). Briefly, considerable sentiment against traps and trapping furbearers was present during the 1920's when the numbers of some furbearers were low and trapping activity with minimum regulation was at a high level. Deems and Pursley (1983) point out that both the anti-trap sentiment in the 1920's as well as the current opposition that started in the 1970's followed anti-seal killing campaigns that "apparently stimulated a public resentment of the commercial use of wild animal pelts and, subsequently, the methods used for capturing furbearers." The AntiSteel-Trap-League was formed in 1920 (later changed to Defenders of Wildlife in 1925) in

response to steel-trap use in animal damage control programs such as 'that administered by the Bureau of the Biological Survey. At the same time fox and raccoon hunters in the Southeast mounted campaigns to outlaw traps in South Carolina and Georgia. Massachusetts banned foothold traps in 1930 because of pressures from fox hunters and protectionists activities (Deems and Parsley 1983).

New anti-hunting and anti-trapping organizations were formed in the 1950's and the number of animal rights and animal welfare organisations has gained momentum within the last 10-15 years, as evidenced by the 1984 compilation of a directory of such organizations by the Association for Biomedical Research (ABR 1984). This directory listed 140 organizations based in the United States and as additional 152 with offices outside the country, mostly headquartered in Canada and the United Kingdom. Included among these were several groups whose members had business or professional backgrounds that can assist the animal rights/welfare movement with publicity or expertise in speciality areas. These groups included Actors and Others for Animals, Association of Veterinarians for Animal Rights, Attorneys for Animal Rights, Psychologists for Ethical Treatment of Animals, and Scientists' Center for Animal Welfare.

Animal welfare/rights organizations generally operate 4 ways: (1) protest demonstrations usually accompanied by boycotting fur products, (2) attempts to establish substitutes for fur products, (3) legislation, and (4) appeals in magazines, newspapers and through broadcast media.

Gentile (1983) identified 3 distinct historical anti-trap phases. The first, from 1925 to about 1940, was a period distinguished by a sharp increase in anti-trapping legislation and literature. The second, from about 1940 to the mid-1960's, was characterized by regulatory activities and compromise. The current and third phase, beginning in the late 1960's, is marked by more sophisticated approaches due to experience and knowledge, lesser appeals to the emotion, and use of arguments backed by frequent reference to scientific publications or expert witnesses. Other basic approaches discussed by Gentile (1983) included emotional approaches, those based on documentation, on alternative trap strategy, the relatively recent animal "rights" strategy which argues that animals have the right to exist and to be treated humanely, and when necessary, to be dispatched humanely, and restrictive legislation.

Gentile (1983) determined the numbers and dates of anti-trapping bills introduced in the United States since 1900 by searching the files of various advocacy organizations, contacting each state library and wildlife agency, several state humane and trapper organizations, and the libraries of the Departments of Interior and Agriculture and the Library of Congress. Over 450 major anti-trapping bills had been introduced, about 50% at the state level. About 20% of the anti-trap effort was at the local level and 30% at the federal level. Peak periods of anti-trap activity occurred in the late 1920's and 1930's and again from the 1970's to the present time. Since 1968, 33 states considered anti-trapping bills and 9 states have actually banned trapping. Six states (Florida, Massachusetts, Rhode Island, New Jersey, Tennessee, Connecticut) prohibited trapping or some form of trapping as of 1983. Between 1957 and 1982 some 80 anti-trapping bills were introduced at the federal level with those in 1975 and 1984 receiving serious attention. The 1984 bill had the support of 2596 of the U.S. House of Representatives. Gentile (1983) concluded that, "Anti-trapping activities are likely to continue until decision makers can recognize and accommodate the common goals of the antagonists."

Other approaches have been tried by trapping opponents. These include the 3 anti-trap public referendums in Massachusetts (1930 - passed), Ohio (1977 - failed 2 to 1), and Oregon (1980 - failed 2 to 1). Attempts have also been made to stop trapping by mounting a publicity campaign in Europe to boycott the importation of furs from North America by

the European Economic Community. This was the same approach successfully used to stop the importation of seal furs into Europe. Another strategy has been through actions at the biennial meetings of the Convention on International Trade in Endangered Species (CITES). This international organization of 88 member nations was established in 1973 to monitor and regulate traffic in endangered wildlife at the international level. Attempts were made at recent meetings to initiate debate or introduce anti-trap resolutions seeking to ban international trade in furs taken in steel traps.

Advocacy Organizations

Trapping opponents, comprised almost entirely of publicly supported organizations, fall into 3 basic categories: animal welfare proponents who are not necessarily opposed to trapping but to the methods used, an animal rights segment that sees animals as entitled to many of the same moral and legal rights as humans, and what has been termed a "commercial protest industry" that uses the trap controversy to raise funds. Despite nearly 300 animal welfare/rights organizations being listed in a recent directory (ABR 1984), only a relatively few have actively opposed all trapping or trapping with certain type devices such as foothold traps. These include the American Humane Association (AHA), Animal Protection Institute of America (APIA), Animal Welfare Institute (AWI), Association for the Protection of Fur-bearing Animals (APFA, Vancouver, B.C.), Canadian Association for Humane Trapping (CAHT), Defenders of Wildlife (DOW), Federal Provincial Committee for Humane Trapping (FPCHT, Toronto, Ont., dissolved in 1981), Friends of Animals (FOA), Fund for Animals (FFA), Humane Society of the United States (HSUS), The Institute for the Study of Animal Problems (ISAP, scientific division of the HSUS), and the Mobilization for Animals (MA) that reportedly represents some 400 member organizations. Most of the above organizations have directed their efforts at influencing or introducing legislation through political pressure, attempting to influence public opinion, disseminating written materials, promoting publicity, conducting demonstrations and rallies, and distributing pamphlets and films. The ISAP and DOW have published 2 lengthy reports of their analyses of traps and trapping (Scott 1977, Defenders of Wildlife 1984). Several (AHA, CAHT, FPCHT) have sought more "humane" traps by offering incentive awards or by organized research and evaluation of modified or prototype traps. The FPCHT summarized their activities and recommendations in a lengthy report (FPCHT 1981). The Canadian effort from 1968 to 1979, aimed primarily at kill-type traps, is summarized by Manthorpe (1979).

Organizations supportive of trapping are recreational and commercial trappers, the fur industry, state wildlife and some state agricultural agencies, certain public health officials, the U.S. Fish and Wildlife Service, and various coalition groups who, while they do not trap, believe it to be desirable or necessary. The fur industry is represented by the International Fur Trade Federation (IFTF) and the American Fur Industry (AFI), the latter organization providing support to their Committee for Wildlife Conservation and Legislation. Both the IFTF and the AFI send representatives to CITES meetings as non-government observers (NGO). They also actively support pro-trapping legislation and other activities that promote the harvest, sale and use of fur products. The Wildlife Legislative Fund of America (WLFA) was formed from a state organization organized in 1977 to work against the anti-trapping referendum in Ohio. Its function is "to protect the heritage of the American sportsman to hunt, to fish and trap." The WLFA provides support, public relations expertise, and advice to groups at the local level on ways to oppose anti-trap legislation. The American Fur Resources Institute (AFRI) provides legal counsel to trapping organizations and closely follows, and attempts to influence, legislation which affects trapping.

The National Trappers Association (NTA) and the Fur Takers of America (FTA) represent fur trappers at the national level; many states have affiliate organizations. All seek to counter restrictive anti-trap legislation and to counter arguments and efforts of the animal rights/welfare groups by lobbying, publicity and membership participation. The National Wildlife Federation (NWF), a nonprofit national conservation education organization is supportive of trapping and argues for its use as a way to manage wildlife in a pamphlet titled "Trapping and Conservation" (Pond 1979).

The International Association of Fish and Wildlife Agencies (IAFWA), composed of representatives from government natural resource organizations, authorized a standing Fur Resources Committee in 1975. This committee seeks to evaluate the status of furbearers, develop and disseminate information to promote trapping as essential for wildlife management, provide direction and coordination for research on the most desirable trapping systems, report annually on anti-trapping issues, coordinate committee activities within the IAFWA and assist the parent body with policy statements and programs on wild furbearer management. The Committee recently published a reference book on North American furbearers (Deems and Pursely 1983), sponsored symposia such as the 1980 Worldwide Furbearer Conference, and is presently coordinating a multistate study of the bloodstream Corporation's padded jaw traps.

The Wildlife Society (TWS) was founded in 1937, and with current membership of nearly 8,000 wildlife biologists and allied professionals, actively supports the wise management and conservation of wildlife resources. The society publishes technical journals, monographs, and books, sponsors symposia and conferences, and issues policy statements on controversial issues. In 1985 TWS issued position statements on 22 issues, including 1 on trapping. The Society stated that, "Trapping with steel traps has been used for centuries to harvest wildlife and to reduce animal damage. Today, trapping remains an effective, economical, and ecologically sound method of harvesting or controlling certain species of wildlife. We recognize the need for trapping regulations to accomplish specified management objectives, to assure that humane techniques are used, and to protect non-target species." An ad hoc Technical Advisory Committee on Trapping is currently preparing a background on traps, trapping, and wildlife management to support the Society's current policy statement and will consider if a revision of the present statement is needed. In Canada the recently formed (1983) Fur Institute of Canada (FIC) is continuing the humane trap research begun by the CART and the FPCHT. In 1983, the FIC initiated a 5-year \$2 million research and development program and obtained funds from broadly based sources that included industry, humane, and trapper organizations, and federal and provincial governments. FIC investigations include trap, animal stress, and animal kill threshold research using kill-type traps, padded jaw traps, power leg snares, and live-holding devices.

Trap Research

Trap and trapping research generally falls into 2 distinct categories. One concerns manipulation of and alternate schemes for harvesting furbearers. Harvest control can include regulating lengths of seasons, geographic location of harvest, number of animals harvested, means of setting and checking traps, frequency of checking trap lines, and type and size of traps permitted. The second, the subject of this section, is development and assessment of different types of traps to measure their capture or kill efficiency, selectivity for target species, and the extent of injury sustained by captured animals. Ever since Mascall described and illustrated the first spring trap in 1590 (Dannenfeldt 1982), inventors and innovators have been modifying or fabricating steel traps. Over 4,000 patents have been issued in Canada and the United States (2,500 in the U.S.) for alternate trap types (Stewart 1977). The bloodstream Corporation has over 2,000 traps in their trap museum (bloodstream

Corp., P. Askins, pens. common.). The American Humane Association (AHA) established a humane trapping committee in 1926 and began a humane trap contest in 1927 for a suitable replacement for the foothold trap; thousands had been submitted by 1936 (Anonymous 1936, in Gentile 1983). The contest was discontinued during WW II but resumed afterwards at which time Weldon Robinson, a USFWS research biologist, served as a member of the evaluation committee (Robinson 1959). He noted that 147 trap entries were received from 1956 to 1959 and stated that the best approach would be to modify the foothold trap principle. More recent efforts in the United States to modify or improve existing traps included formation of the Massachusetts Committee for the Study of Trapping in 1974. This committee sought to evaluate new trap types, including padded foothold traps and a timing device that was to release captured animals after a period of time. Research was planned to compare costs, efficiency, and physical damage parameters of the foothold trap and alternative devices. Unfortunately, the proposal never got beyond the planning stage because state legislation prohibited field use of some types of traps (C. Prescott 1981, pets. common.).

The USFWS Denver Wildlife Research Center (DWRC) has worked, since 1975, at modifying foothold traps for taking coyotes although some earlier work on tranquilizer trap tabs for reducing foot damage to coyotes was reported by Baker (1965). More recently, DWRC studies have looked at reducing foot injury and the capture of nontarget species with tranquilizers, modified trap chains, and pan tension devices (Linhart et al. 1981, Turkowski et al. 1984). Ongoing work is aimed at developing methods for assessing foothold trap performance and at evaluating padded-jaw foothold traps (Johnson et al. In press, Linhart et al. In press, and Olsen et al. In press). Padded-jaw traps developed by the bloodstream Corporation have received widespread attention as a means of reducing injury to captured animals. Besides "in house" development by bloodstream, prototype and production models have been evaluated by Tullar (In press) in N.Y., and Saunders and Roswell (1984) in British Columbia and are currently the subject of a multistate study being coordinated by the Fur Resources Committee of the IAFWA. Test results by Linhart et al. (In press) have so far shown that foot injury in padded traps is substantially reduced but that catch efficiency is somewhat reduced also. According to the bloodstream Corporation, recent modifications of their traps have corrected problems associated with reduced efficacy (J. Thomas, bloodstream Corp., 1985, pets. communJ).

Canada, more than any other country, has sought alternate trap types, concentrating efforts on kill-type devices. Use of kill-type traps is more feasible in Canada because of its sparsely settled human population where exposure of pets and children to this type of trap is unlikely. A Humane Trap Development Committee (HTDC), initiated in 1968 and sponsored by the Canadian Association for Humane Trapping (CART) and other Canadian humane groups,, has sought and evaluated alternate kill-type traps for many years using cash incentive grants, field testing, and even trading Conibear traps for foothold traps (CART 1975, Manthorpe 1979). CAHT research was conducted at McMasters University and the University of Guelph. Trap research was later taken over by the Federal Provincial Committee for Humane Trapping (FPCHT) which issued its final report in 1981. Between 1974 and 1981, the FPCHT established criteria for evaluating humane traps, conducted extensive kill threshold tests using captive animals, defined mechanical characteristics and evaluated experimental kill-type traps, conducted limited trap assessments in the field, made extensive recommendations regarding which type of traps and future trapping systems should be used for different furbearers in Canada, and recommended future actions and priorities.

The FPCHT received 348 ideas for trapping devices of which 104 killing traps were mechanically evaluated for impact and clamping force. Sixteen killing traps were approved and given limited field evaluation (FPCHT 1981). The Fur Institute of Canada (FIC) is currently undertaking research, development and use of improved humane trapping systems, but

these efforts have not been in effect long enough to produce publishable conclusions. The Canadian work has resulted in several useful publications on innovative kill-type traps and their mechanics, including the development of a national standard for humane, mechanically powered, trigger-activated traps of this type (Canadian General Standards Board, 1984).

The recent interest in spring-powered leg snares as a replacement for the foothold trap merits brief comment. Novak (1981) reported upon a new power leg-snare for capturing several species of furbearers that was modeled after the Aldrich bear snare. He compared it with foothold traps and concluded that it was equally effective but caused less damage to captured animals. Berchielli and Tullar (1980) compared a steel trap with another type of power leg-snare ("Ezyonem") for foxes and raccoons but found that the snare was less efficient and caused equal damage. England (1982) compared yet a third type of leg snare with unpadded anti padded foothold traps, all set in snow and affixed to a wooden drag pole, and recorded tooth and leg injuries sustained by red foxes. The padded trap and leg snare caused less damage but comparative efficacy was not addressed. These 3 studies, while reporting new findings, were inadequate for recommending the use of leg snares in lieu of the steel trap. Unfortunately, proponents of foot snares as replacements for foothold traps continue to make judgments on the basis of very limited data and lack proof that snares reduce injury and are as effective and adaptable as the foothold trap. Deems and Parsley (1983), referring to trapping technology, state that, "Trapping system evaluations and research should include, but not be limited to, a scientifically and statistically designed methodology followed by field evaluation under a variety of environmental, political, sociological and economic conditions that exist domestically, as well as internationally."

Recommendations

This brief review of the current status of traps, trapping, furbearer management, and public attitudes provides a basis for making recommendations regarding the use of steel traps as a management technique.

- Establish a national center for trap technology and furbearer management, comparable to the Fur Institute of Canada (FIC) and supported by a broad spectrum of interest groups, both private and governmental.
- Acquire funds for trap research and furbearer management from trapper license fees or a tax on traps, trapping equipment, or fur products (Fritzell and Johnson 1982) and allocate to a national center or to state agencies.
- Increase support of trapping as a wildlife management technique through joint efforts by industry, government, wildlife managers and reseachers, trappers, sportsmen and public health and agricultural interests.
- Place a high priority on trap research and development; acquire performance data on commercially available traps and modified or innovative new capture devices.
- Develop replicable test standards for laboratory and field assessment of capture devices, preferably under the auspices of organizations such as the American National Standards Institute or the American Society for Testing and Materials.
- Conduct more research on furbearer biology, ecology, behavior, and methods of census, to facilitate more knowledgeable management decisons.
- Annually assess furbearer status and population trends at both state and national levels

with a central repository for these data.

- Investigate the social and economic aspects of trapping to gain new insight into ways of resolving the controversy.
- Encourage technical meetings on trapping and furbearer management, such as the 1980 Worldwide Furbearer Conference and the 1981 Midwest Furbearer Symposium, to bring together specialists and to disseminate state-of-the-art knowledge.
- Provide scientific information to individuals and lay groups interested in utilization of traps and other capture devices.
- Establish educational programs particularly oriented to youths and require education programs as a condition of licensing for first-time trappers.

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