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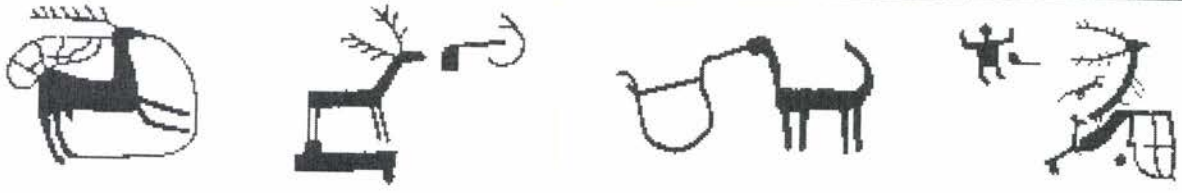
TRAPPING AND FURBEARER MANAGEMENT IN NORTH AMERICAN WILDLIFE CONSERVATION



Trapping and Furbearer Management in North American Wildlife Conservation

is a compilation of the knowledge, insights and experiences of professional wildlife biologists who are responsible for the conservation of wildlife resources throughout the United States and Canada. It is based on the original *Trapping and Furbearer Management:Perspectives from the Northeast* published in 1996 by the Northeast Furbearer Resources Technical Committee. This expanded North American edition was authored by the following subcommittee of the Northeast Furbearer Resources Technical Committee (NEFRTC): Dr. John F. Organ, Subcommittee Chairman, U.S. Fish and Wildlife Service; Thomas Decker, Vermont Department of Fisheries and Wildlife; Susan Langlois, Massachusetts Division of Fisheries and Wildlife; and Peter G. Mirick, Massachusetts Division of Fisheries and Wildlife.

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The Northeast Furbearer Resources Technical Committee

is comprised of professional wildlife biologists from the northeastern United States and Provinces of eastern Canada, and is committed to the study and responsible management of our furbearer resources.

The Northeast Section of The Wildlife Society

is comprised of professional wildlife biologists and resource scientists and managers from eleven northeastern states and six eastern Canadian provinces, and is committed to excellence in wildlife stewardship through science and education.

For further information on Furbearer Management and Trapping in your state or province, contact your local Fish and Wildlife or Natural Resources Department.

Cover photo of raccoon by Bill Byrne.
Pictographs on cover portray cave drawings of methods ancient peoples used to capture wild animals.

Introduction

The trapping of furbearers — animals that have traditionally been harvested for their fur — has been an enduring element of human culture ever since our prehistoric hunter-gatherer ancestors devised the first deadfalls, pit traps, snares and capture nets. People were dependent upon furbearers to provide the basic necessities for survival — meat for sustenance, and fur for clothing, bedding and shelter — throughout most of human history. Defining and defending territory where furbearers could be captured to acquire these critical resources united families, clans and tribes long before the invention of agriculture and animal husbandry gave rise to ancient civilizations. While modern technology and agriculture have significantly reduced human dependence on furbearers for survival, people in both rural and developed areas continue to harvest furbearers for livelihood and personal fulfillment. The taking and trading of furbearer resources remain on the economic and environmental agendas of governments throughout the world.

Trapping furbearers for their fur, meat and other natural products presumably began with our earliest ancestors on the African continent. It has a long tradition in North America, dating back to the time the first aboriginal people arrived on the continent. Several thousand years later, fur was the chief article of commerce that propelled and funded European colonization of the continent during the 17th and 18th centuries. Numerous cities and towns founded as fur trading centers during that period still bear witness to the fact that furbearer trapping had a major influence on the history of the United States and Canada.

The utilization of furbearer resources was unchallenged throughout that history until early in the 20th century, when the first organized opposition to furbearer trapping emerged. The focus of that opposition was primarily on development of more humane traps and curtailment of trapping abuses, rather than against trapping itself or continued use of furbearer resources. During the 1920s opposition magnified to challenge the use of steel jaw foothold traps and the wearing of fur.[1] In response to this development, proponents of trapping and the fur industries began organizing to defend themselves. By the 1930s, furbearer trapping had become a recurrent public issue. Since then, the pro- and anti-trapping factions have disseminated enormous amounts of generally contradictory information.

During this same period, new technologies and advances in ecology, wildlife biology, statistics and population biology allowed wildlife management to develop into a scientific profession. State, provincial and federal agencies were created to apply this science to protect, maintain and restore wildlife populations. The harvest of furbearers became a highly regulated, scientifically monitored activity. Trapping and furbearer management — one steeped in ancient tradition, the other rooted firmly in the principles of science — allowed furbearer populations to expand and flourish.

Today, as controversy over the use and harvest of furbearers continues, professional wildlife managers find themselves spending considerable time trying to clarify public misconceptions about trapping and furbearer management. The complex issues involved in that management — habitat loss, animal damage control, public health and safety, the responsible treatment of animals — cannot be adequately addressed in short news articles or 30-second radio and television announcements.

This booklet is intended to present the facts and current professional outlook on the role of trapping and furbearer management in North American wildlife conservation. It is the combined work of many wildlife scientists responsible for the successful conservation of furbearer populations in the United States and Canada.

Photo by Bill Byrne

The Furbearer

Technically, the term **furbearer** includes all mammals, all of which, by definition, possess some form of hair. Typically, however, wildlife managers use the term to identify mammal species that have traditionally been trapped or hunted primarily for their fur. North American furbearers are a diverse group, including both carnivores (meat-eating predators) and rodents (gnawing mammals). Most are adaptable species ranging over large geographic areas. They include beaver, bobcat, badger, coyote, fisher, fox, lynx, marten, mink, muskrat, nutria, opossum, raccoon, river otter, skunk, weasels and others. A few animals that are normally hunted or trapped primarily for their meat or to reduce agricultural or property damage may also be considered furbearers if their skins are marketed.

*A magnified view of red fox fur shows the short, dense **underfur** that provides insulation and water repellent qualities, and the longer **guardhairs** that resist abrasion and protect the underfur from matting.*

Most furbearers possess two layers of fur: a dense, soft **underfur** that provides insulation and water-repellent qualities; and an outer layer of longer, glossy **guardhairs** that grow through the underfur, protecting it from matting and abrasion. A fur is said to be **prime** when the guardhairs are at their maximum length and the underfur is at its maximum thickness. Fur generally becomes prime in midwinter when the coat is fresh and fully grown; the timing for primeness may vary somewhat depending on species, location (latitude) and elevation.

Furs are generally "dressed" (tanned with the hair on), then trimmed and sewn into garments, rugs, blankets and ornaments, and sometimes dyed in a variety of colors and patterns. Furs are also used in fishing lures, fine brushes and other products. Some furs are shaved, and the hair processed into felt for hats and other garments.

Fur is a renewable (naturally replenished) resource, a product of long traditional use, valued by many for its natural beauty, durability and insulative qualities. Fur is only one of many values that people ascribe to furbearers (see page 27).

Photos by Bill Byrne

Photo by Jack Swedberg

Furbearers are a diverse group including several rodents and numerous carnivores (meat-eaters). The muskrat (above, left), a wetland herbivore (plant-eater), is the number one furbearer in the United States and Canada based on the number of pelts harvested each year. The beaver (above, right) is the largest native rodent in North America, best known for its ability to fell trees and dam streams. Facing page, top, the fisher, a member of the weasel family, is an opportunistic predator equally at home in the trees or on the ground. Below, the red fox, like the beaver, has achieved considerable success in adapting to suburban environments.

Photos by Bill Byrne

Issues in Furbearer Management

There are three major issues involving the conservation and management of furbearers today: human population growth with its inevitable degradation and destruction of wildlife habitat; increasing public intolerance of furbearers in populated areas; and opposition from animal rights activists to any harvest or use of wildlife.

Loss of Habitat

The first and most critical issue challenging furbearer conservation today is human population growth and the resultant degradation and destruction of wildlife habitat. Without adequate habitat, wildlife populations cannot be sustained. While no furbearer species is in immediate jeopardy due to habitat loss in North America (because furbearers are typically abundant, adaptable species often covering large geographic areas), the range of some populations has been reduced. Habitat destruction has eliminated the option to restore some species to areas where they once existed.

Among wildlife scientists, ecologists and biologists, no issue is of greater concern than the conservation of wildlife habitat. Every government wildlife agency is directing significant educational and/or financial resources to the conservation of habitat. Habitat conservation is the key to maintaining the viability of all wildlife populations and the ecosystems on which they depend. Unlike habitat destruction, regulated trapping is a sustainable use of wildlife resources, and does not, in any way, jeopardize the continued existence of any wildlife population.

Photo by Bill Byrne

The continuing loss of wildlife habitat is the most critical issue in wildlife conservation today. Unlike regulated trapping, habitat destruction threatens the existence of wildlife populations and the ecosystems on which they depend. Further, as development encroaches on wildlife habitat, adaptable furbearer species create problems for homeowners, increasing public intolerance of these valuable wildlife resources.

Public Intolerance

While habitat loss is a direct threat to wildlife populations, it also has indirect consequences. As wildlife habitat continues to be fragmented and eliminated by development, wildlife managers are confronted with new challenges: coyotes killing pets, beavers cutting ornamental trees and flooding roads and driveways, raccoons invading buildings and threatening public health with diseases and parasites. These kinds of human-wildlife conflicts reduce public tolerance and appreciation of furbearers. While **Biological Carrying Capacity** (population level an area of habitat can support in the long term) for a furbearer species may be relatively high, the **Cultural Carrying Capacity** (population level the human population in the area will tolerate) may be lower.[2] Wildlife managers, responding to public concerns, have implemented furbearer damage management programs at state and federal levels.

A growing dilemma is that furbearers, while of great recreational, economic, and intrinsic value to society, are also increasingly a public liability. The challenge — magnified in and near areas of dense human population — is to satisfy various constituents with different interests and concerns while conducting sound wildlife management. Wildlife agencies typically use an integrated approach involving education, barriers, deterrents and lethal techniques to address specific problems, while fostering public tolerance for wildlife that causes damage. The combination of as many feasible options as possible provides for the most successful program. Wildlife agencies have long relied on the free services provided by the public who trap to assist landowners suffering damage caused by furbearers. Unfortunately, due to various environmental, economic and sociological factors, traditional fur trapping — which reduces animal damage at no cost to the public — tends to be a rural activity. The number of people newly involved in this cultural activity has declined in recent years, particularly in suburban and urban areas.

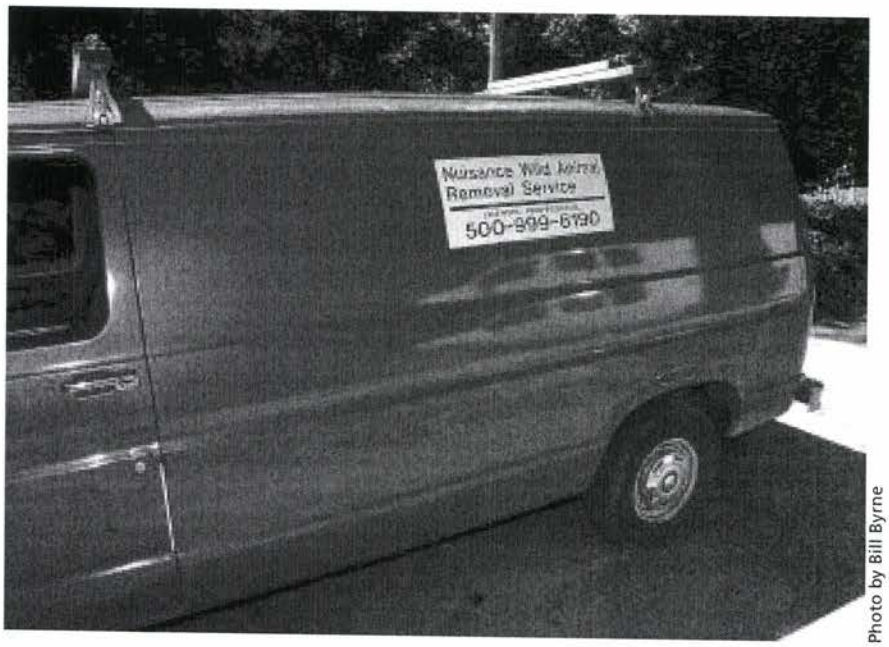


Photo by Bill Byrne

Nuisance animal control is becoming a growth industry in many areas as development fragments wildlife habitat and traditional fur trapping declines. This trend is of concern to wildlife biologists, for it indicates that a growing segment of the public is losing its tolerance and appreciation for some wildlife species, viewing them as problems that should be removed and destroyed, rather than as valuable resources that should be utilized and conserved.

With the decline of traditional fur trappers, "nuisance animal control" has become a growth industry. Businesses specializing in trapping and removal of "problem" animals are thriving in many areas. This trend is of concern to wildlife biologists, for it indicates that a growing segment of the public is coming to view furbearers as problems that should be removed and destroyed, instead of valuable resources that should be utilized and conserved. Regardless, regulated trapping provides an important and effective method to meet the public's demand for reduction of furbearer damage.

Animal Rights

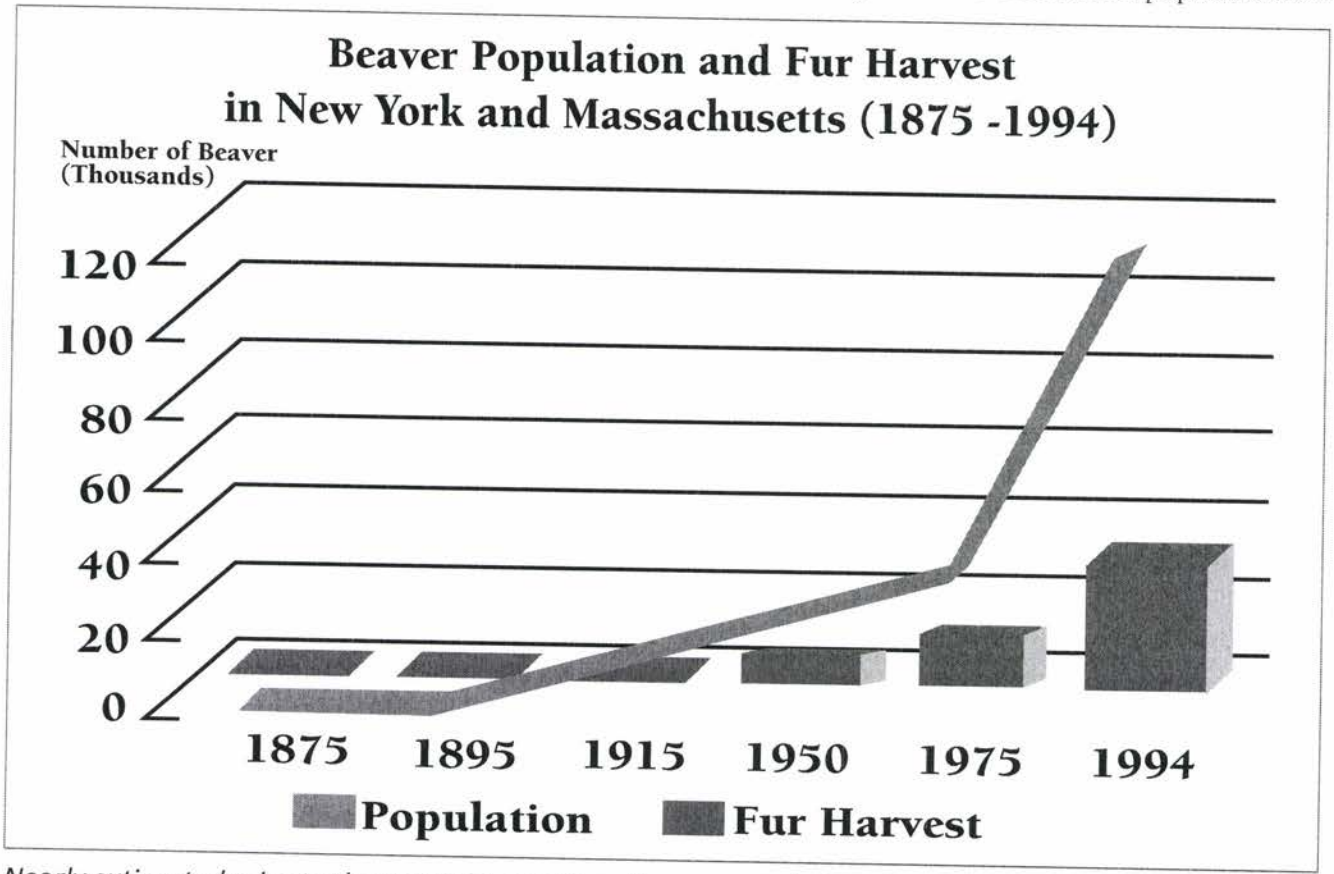
As wildlife managers are faced with having to rely more on regulated trapping for furbearer population management and damage control, animal rights activists demanding an end to trapping are appealing for public support. Those advocating "animal rights" would eliminate all trapping and use of furbearers. Without regulated trapping, the public would have far fewer reliable and economically practical options for solving wildlife damage problems associated with furbearers.

Public Wildlife Agencies Manage Our Wildlife Resources

Furbearer management programs in the United States and Canada are primarily conducted by state and provincial wildlife agencies. Current management programs respond to and respect the diversity of people and cultures and their values toward wildlife resources. In the United States, most funding for furbearer management comes from two sources: hunting and trapping license revenues, and federal excise taxes on firearms, ammunition and archery equipment (federal aid). Most wildlife management is not funded with general tax dollars. Federal aid — now amounting to over 200 million dollars in some years among the 50 states, territories and the Commonwealth of Puerto Rico — has been provided since passage of the Federal Aid in Wildlife Restoration Act (also known as the Pittman-Robertson Act) in 1937. Federal funds and the assistance of certain federal agencies are also available for wildlife damage management programs within each state.

State and provincial wildlife agencies manage furbearer populations for the benefit of a public with diverse opinions. Wildlife managers must therefore balance many objectives simultaneously. These objectives include preserving or sustaining furbearer populations for their biological, ecological, economic, aesthetic and subsistence values, as well as for recreational, scientific and educational purposes. It is sometimes necessary to reduce furbearer populations to curtail property damage or habitat degradation, or to increase furbearer populations to restore species to areas where they have been extirpated (eliminated within an area).

Professional wildlife biologists meet the public's objectives by monitoring and evaluating the status of furbearer populations on



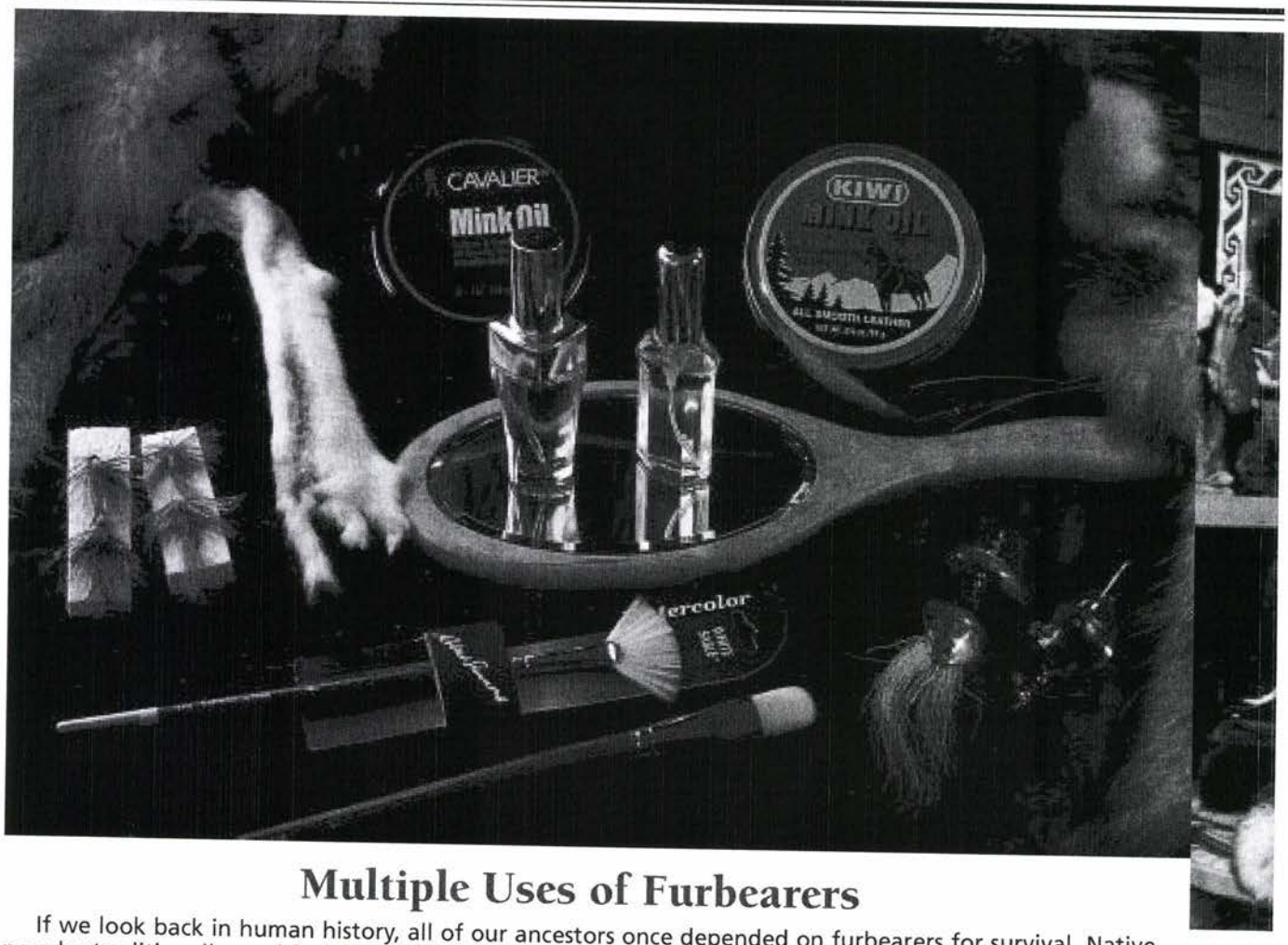
Nearly extirpated prior to the start of the century, beaver populations have responded to applied wildlife management in a dramatic fashion.[3] Like many other furbearer species, the beaver has been restored to much of its former range while sustaining considerable, scientifically regulated public fur harvests.

Photo by Bill Byrne

Many states and provinces require that the pelts of certain species of furbearers taken by trappers must be officially examined and tagged (sealed or stamped) before they may be sold. This allows wildlife biologists to closely monitor harvest rates of some species while collecting invaluable data on population trends. When biologists need more information, regulations may be adjusted to require that trappers turn in the carcasses or certain parts of their harvested animals. This allows biologists to examine such things as reproductive rates, food habits, sex and age ratios and other information that is often useful in managing furbearer and other wildlife resources.

a regular basis, and responding with appropriate management options. Much of the information known about furbearer populations — as well as the management of furbearer populations — has been derived from trapping. Accounting for yearly variation in the numbers, sex and age of animals caught by licensed trappers, along with variation in effort provided by trappers, is an economical way to monitor population fluctuations. In many cases, biologists acquire information directly from harvested animals. More intensive (and expensive) research projects are initiated when additional information essential to management is needed. Many jurisdictions adjust trapping regulations in response to population changes to either increase or decrease the population in response to the public's desires.

Management plans and regulations restrict trapping seasons to periods when pelts are prime and the annual rearing of young is past. Historical records demonstrate how applied wildlife management sustains regulated harvests: populations and harvests of most furbearing species have generally increased in North America during this century. Beaver, for example, were almost eliminated from the eastern United States and greatly reduced in parts of eastern Canada by the middle of the 19th century. Today they number in the millions, thriving throughout that range wherever sufficient habitat remains and the public will allow their presence. They have been restored to this level while sustaining a substantial, annual, regulated public harvest.[4]



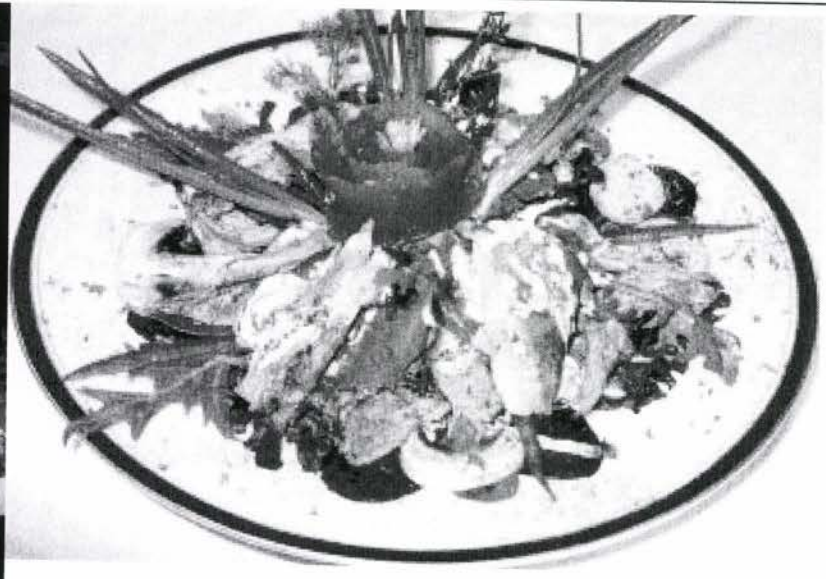
Multiple Uses of Furbearers

If we look back in human history, all of our ancestors once depended on furbearers for survival. Native peoples traditionally used furbearers for food, clothing, medicines, perfumes and other items. Today, many people living in rural and suburban environments throughout North America continue to live close to the land, utilizing furbearers to maintain a sense of self-reliance, remain in touch with their heritage, and participate in a favorite, challenging, outdoor activity. In a free society, such lifestyle decisions are a matter of personal choice.

Photos by Bill Byrne • Nutria dish photo courtesy of Lousianna Dept. of Wildlife & Fisheries

Wildlife managers in many states and provinces have reintroduced extirpated furbearer species. Extirpation was ultimately caused by widespread degradation and loss of habitat associated with the colonization of North America and subsequent growth of human populations. In some instances this was combined with excessive exploitation because there were no wildlife agencies to establish and enforce regulations designed to protect furbearer populations. Where habitat and public support are available, the reintroduction of extirpated furbearers has been remarkably successful. In both the United States and Canada, species such as beaver, river otter, fisher and marten have been reintroduced and restored throughout much of their historical range.

The time when furbearer species could be extirpated due to excessive, unregulated harvest is long past. Today, professional wildlife biologists are responsible for furbearer management. Most have devoted years of academic, laboratory and/or field research to the study of furbearer species. Their mission is the conservation of furbearer populations. They have been highly successful in that mission as evidenced by the restoration and current abundance of furbearer populations.



Harvested furbearers have many uses today, reflecting the utilitarian values of many of the people who harvest them. Pelts are used for clothing such as coats, hats, mittens (made by craftspeople in Maine, left) and blankets, and are also used to make moccasins, banjos, rugs, wall hangings and other forms of folk art. Fur is also used in fine art brushes, water repellent felt for hats, and high quality fishing lures. Some people use the meat of furbearers such as raccoon, beaver, nutria (prepared by a Louisiana chef, above) and muskrat for tablefare or as a food source for pets. It is delicious and nutritious, high in protein and low in fat. The glands of beaver are used in perfume, and glands and tissues from these and other furbearers are used to make leather preservatives, scent lures, and holistic medicines, salves and moisturizers. Even the bones, claws and teeth of harvested furbearers are sometimes used to make jewelery.

Principles of Furbearer Management

The goal of furbearer management is the conservation of furbearer populations. The main tenet of conservation is this: **Native wildlife populations are natural resources — biological wealth — that must be sustained and managed for the benefit of present and future generations.** If those wildlife populations are furbearer species, one important public benefit conservation provides is the opportunity to harvest some animals for food, fur or both. The harvest of animals for these purposes is among the most ancient and universal of human practices. Today, under scientific wildlife management, harvests are controlled and regulated to the extent that the survival of furbearer populations is never threatened. No furbearer species is endangered or threatened by regulated trapping. **North American wildlife conservation programs apply three basic principles in establishing and managing harvest of wild animals: (1) the species is not endangered or threatened; (2) the harvest techniques are acceptable; and (3) the killing of these wild animals serves a practical purpose.**[5]

It is important to understand that the aim of professional wildlife management is to perpetuate and ensure the health of wildlife populations; not the survival of individuals within those populations. Wildlife management does not generally focus on individuals because individuals have short life spans. On the time scale that conservation is pledged to address, individuals do not endure. Populations *do*. Populations — provided with sufficient habitat and protected from excessive exploitation — are essentially immortal. Wildlife managers apply scientific methods to maintain

furbearer species as viable, self-sustaining populations.

Population Dynamics

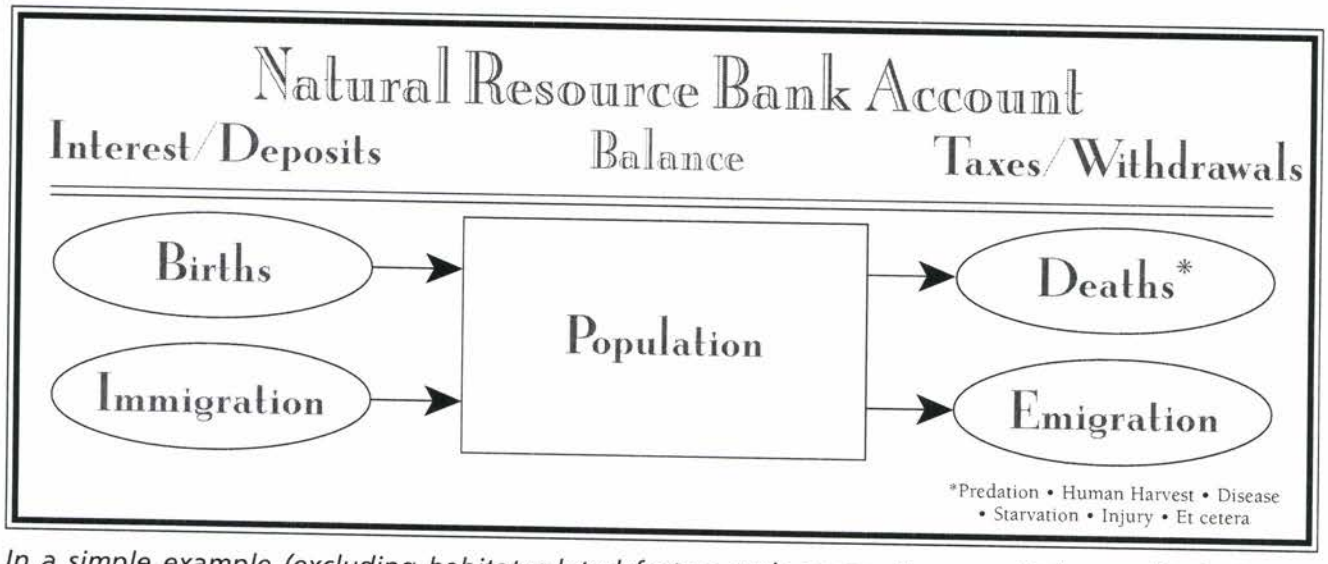
Like all populations, those of furbearers are dynamic. They are always in a state of flux, interacting directly and indirectly with other animal, plant, bacterial and viral populations. In response to these interactions and a host of other environmental factors — many of which are today related directly to human actions — furbearer populations increase and decrease in density (number of individuals in any given area) and range. Wildlife managers monitor wildlife populations to determine if they are increasing, decreasing or stable; to identify factors that affect those population trends; and to manipulate some of those factors to achieve the goals of conservation.

The laws of evolution and survival demand that the reproductive rate (the number of individuals born) of any population must equal or exceed its mortality rate (the number of individuals that die). If, over time, births do not equal or outnumber deaths, the population will become extinct. As a result, all species have evolved to produce a surplus of young during each generation. Furbearer species are no exception; many are capable of *doubling* their populations within a single year.

Because they produce a surplus of young, populations should theoretically grow continuously. The reason they do not is because as populations grow, various **limiting factors** slow or stop population growth. Resources required for survival — food, water, shelter and living space — are limiting factors. As a population grows, one or more of these resources may become scarce to the point that some members of the population fail to acquire them and therefore die, disperse or fail to reproduce. Other limiting factors include communicable diseases and predation. These are **density-dependent** factors — that is, they increase as the density of the population increases.

Photo by John Organ

Professional wildlife biologists are responsible for furbearer management today. They have been highly successful in their mission because they use the best scientific information available to ensure the present and future health of furbearer populations.



In a simple example (excluding habitat-related factors such as carrying capacity), a stable furbearer population can be compared to a bank account: interest and deposits (births and immigration) increase the balance (population) every spring and summer; taxes and withdrawls (mortalities and emigration) decrease it by roughly the same amount every fall and winter. Accountants (wildlife biologists) monitor the bank statements and advise the owner (the public) on when and how much of the balance can be withdrawn (harvested) that would otherwise be lost to taxes (other forms of mortality).

Other limiting factors are **density-independent**. These include weather extremes, habitat destruction and other catastrophic events. These reduce populations regardless of density. Some limiting factors such as road mortality (killed by vehicles) may be both density dependent *and* independent. Road mortality, for instance, is likely to increase as population density increases; however, it also will increase as more roads are built, regardless of population density.

Healthy furbearer populations cycle (increase and decrease about equally) on an annual basis. Most increase in the spring and summer with the birth of young; decrease in the fall and winter as natural mortality and emigration increase. Annual cycles are most dramatic in furbearer populations with high reproductive rates. Muskrat populations, for example, can decline by 75 percent during winter — and rebound completely by the following fall![6]

Banking Resources

Wildlife managers normally set furbearer trapping seasons to allow use of a portion of the individuals that would otherwise be lost to disease, starvation, predation and other mortality factors. The standard regulated harvest is **compensatory** mortality: it *replaces* mortality factors that would otherwise have reduced the population by a similar amount. A scientifically regulated, annual harvest can be sustained indefinitely because it removes only the surplus, leaving sufficient reproducers to restore the surplus.

As a simplified example, imagine a stable furbearer population as a bank account. The balance (population) is a continually shuffled stack of bills (individuals). The account accumulates interest (the birth of young) every spring. Taxes (predation, disease, etc.) are always taking a few bills out of the pile. If the interest is allowed to accumulate, taxes increase dramatically every winter. However, if the interest is withdrawn (hunted or trapped) by the owners (the public), taxes do not increase. Either way, through taxes or withdrawals, the balance remains about the same from year to year. Wildlife managers are the accountants who advise the owners on when and how much interest can be withdrawn from the account.

Furbearer Population Management

Wildlife biologists manage furbearer populations in much the same way they manage other fish and wildlife populations such as bass, deer and eagles: they monitor the populations, determine the best management goals for each population (i.e. should it be increased, decreased or stabilized in the best interests of the public and conservation), and then set harvest regulations/restrictions accordingly. Under most circumstances, the aim is to keep populations stable over time.

Year	1	2	3	4	5	6	7	8	9	10
Adults	2	2	2	6	10	14	26	46	74	126
2 Yr Old	0	0	4	4	4	12	20	28	52	92
1 Yr Old	0	4	4	4	12	20	28	52	92	148
Kits	4	4	4	12	20	28	52	92	148	252
Total	6	10	14	26	46	74	126	218	366	618

In the absence of limiting factors such as inadequate habitat, disease, predation and human harvest, beaver populations are capable of very high rates of growth. Regulated trapping helps control furbearer population growth and reduce furbearer damage at no cost to the public, and does not threaten the viability of furbearer populations.

Under some circumstances — when a furbearer population is causing damage by threatening the survival of endangered species, damaging fish and wildlife habitat, or creating a hardship for landowners or agricultural producers — it may be desirable to reduce furbearer populations within some areas. In these situations, wildlife managers may adjust trapping and hunting regulations to increase the harvest beyond surplus production. When population reduction is the objective, the harvest adds to the annual mortality rate. This controlled **additive** mortality will cause the population to decline.

Conversely, there are situations when it is desirable to increase furbearer populations. These occur when efforts are being made to restore an extirpated species, or when a severe population reduction has taken place. In such cases wildlife managers might restrict or prohibit harvests for a time to encourage a rapid population increase.

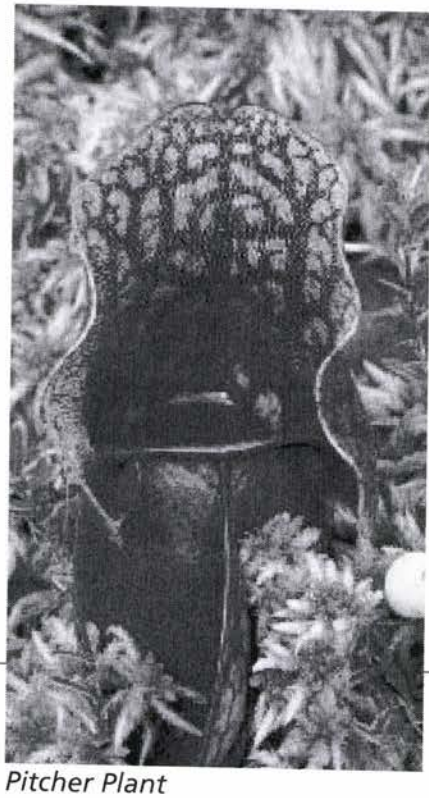
The beaver is an excellent example of a furbearer that warrants intensive management. Wetlands created by beaver are highly productive systems with an abundance of water and nurients. They support a huge diversity of plants and invertebrates, and provide habitat for hundreds of fish and wildlife species. If the management objective is to maintain species abundance and diversity, it is prudent to manage beaver for its positive wetland values.

However, beaver populations often require control to reduce conflicts with humans. Although problems with beaver flooding roads and damaging property are widespread, the problems would be more intense, and the economic impacts greater, without the harvests of beaver during regulated trapping seasons. Almost half a million beaver are harvested from the states and provinces in any given year.[7] This reduction is important in controlling the growth of beaver populations and reducing property damage. It does not threaten the viability of beaver populations or their positive wetland values.

Muskrat, nutria and beaver are the only furbearers in North America that, like deer, can significantly lower the quality of their habitat (by consuming a high percentage of the vegetation) if their populations are not maintained at an appropriate level. Additionally, lowering nutria populations may be a legitimate goal in making marsh habitats more suitable for other wildlife species and in preventing erosion and the loss of marsh vegetation.

Regulated trapping is the most efficient and practical means available to accomplish regular population reductions, and it does so at no cost to the public.

Although the populations of some furbearer species are prone to attain high local densities, and then to "crash" dramatically as density-dependent limiting factors (e.g. food availability and disease) are activated, most furbearer



Pitcher Plant

species become relatively stable once their populations reach a given density. However, that density may be beyond what the human population can tolerate. If the level of human-furbearer conflicts (or conflicts with other wildlife species and habitats) becomes too great, population reduction can be a responsible management alternative.

While furbearer population reduction is not a goal for most furbearer management programs, population reductions in specific areas can control the frequency of furbearer conflicts with humans, lessen predation on rare, threatened or endangered species, or reduce negative impacts on habitats and property.

The case of the piping plover, a beach nesting bird, provides a good example of how furbearer population reductions can assist in the restoration of a rare species. The piping plover, a federally listed threatened shorebird protected by both U.S. and Canada endangered species legislation, is vulnerable to predation by foxes and other predators while nesting. Trapping in and around piping plover habitat has reduced local predator populations, allowing enhancement of the dangerously low plover population, while the predators can be utilized as valuable, renewable, natural resources.[8]

Trapping Protects Rare & Endangered Species

Foothold traps are sometimes used to capture rare or endangered species unharmed so that the animals can be introduced into favorable habitats to reestablish healthy populations (see page 34). However, foothold traps also play an important role in protecting the health and viability of many established or newly reestablished populations of rare and endangered species. Foothold traps are particularly important management tools for protecting rare or endangered species from undesirable levels of predation caused by fox and coyote.

The following is a *partial* list of endangered or threatened plant, reptile, bird and mammal species in North America which are being protected and managed through the use of modern foothold traps:

Rare Species Under Restoration

Pink Lady Slipper
Pitcher Plant
Desert Tortoise
Sea Turtle
Alleghany Wood Rat
Aleutian Canada Goose
Attwater's Prairie Chicken
Brown Pelican
Mississippi Sandhill Crane
Alabama Beach Mouse
Columbian White-tailed Deer
San Joaquin Kit Fox
Whooping Crane
Least Tern
Black-footed Ferret
Piping Plover

Species Trapped to Aid Restoration

Beaver
Beaver
Coyote
Raccoon
Raccoon
Arctic Fox
Coyote
Coyote
Coyote
Red Fox
Coyote
Coyote
Coyote, Red Fox
Red Fox, Raccoon, Coyote, Opossum
Coyote (taken for disease monitoring)
Red Fox, Raccoon, Mink, Striped Skunk

Photos by Bill Byrne

Piping Plover

The target animals trapped during these operations to reduce habitat damage or predation on the rare species are either removed or relocated after capture. The trapping may be carried out by federal, state or provinicial wildlife biologists and animal control agents, or by private, regulated trappers.

Protecting America's Important Wetlands with Regulated Trapping

The coastal wetlands along the Gulf coast of Louisiana are among the most productive and important fish and wildlife habitat types found in the United States. The largest expanse of wetlands in the contiguous U.S. occurs in Louisiana, comprising 25% of the freshwater marshes and 69% of the saltwater marshes of the Gulf Coast. This translates to 15% and 40% of these important ecological areas remaining in the United States. Louisiana's wetlands provide a multitude of functions and important values including:

1. Habitat for a diverse array of fish and wildlife species including ***15 million water birds***, ***5 million wintering waterfowl***, over ***1 million alligators*** and ***11 Threatened or Endangered species***;
2. Groundwater recharge, reduction of pollution, and nutrient and sediment reduction;
3. Storm buffer, erosion control and protection from floods;
4. Commercial and recreational marine fisheries with a total economic effect of $ 3.5 billion

In the State of Louisiana over 3.6 million acres of coastal marshes now exist. However, these coastal wetlands are threatened by degradation and destruction through overpopulation of nutria, an exotic rodent found throughout these wetlands.

Nutria are large semi-aquatic rodents native to South America. The Gulf Coast nutria population originated in Louisiana during the 1930s when captured animals were released or escaped into the wild. These animals established a population and began to thrive in coastal wetlands. Nutria weigh an average of 12 pounds each, average 4-5 young per litter, and have several litters each year. Nutria are herbivores that eat wetland plants and vegetation. They will pull and eat plant roots that anchor into the marsh. High populations of nutria foraging on marsh vegetation have resulted in vast areas of marsh becoming entirely void of plants. When vegetation is removed from the surface of the marsh, the very fragile organic soils are exposed to erosion through tidal action. If damaged areas do not revegetate quickly, they will become open water as tidal scour removes soil and thus lowers elevation. Frequently, the plant root systems are also damaged, making recovery through regrowth of vegetation very slow. When a marsh is denuded of plant life by nutria, it is called an "eat-out."

The first region-wide aerial survey to estimate nutria herbivory damage was conducted in 1993 because reduced trapping resulting from lower fur prices allowed nutria, and eat-outs, to increase. Each year the

Coastal wetlands in Louisiana are threatened by high populations of nutria, which can denude or "eat out" large areas of vegetation (below), leaving fragile marsh soils susceptible to erosion and destruction. Inset of fenced area shows what healthy marsh vegetation should look like.

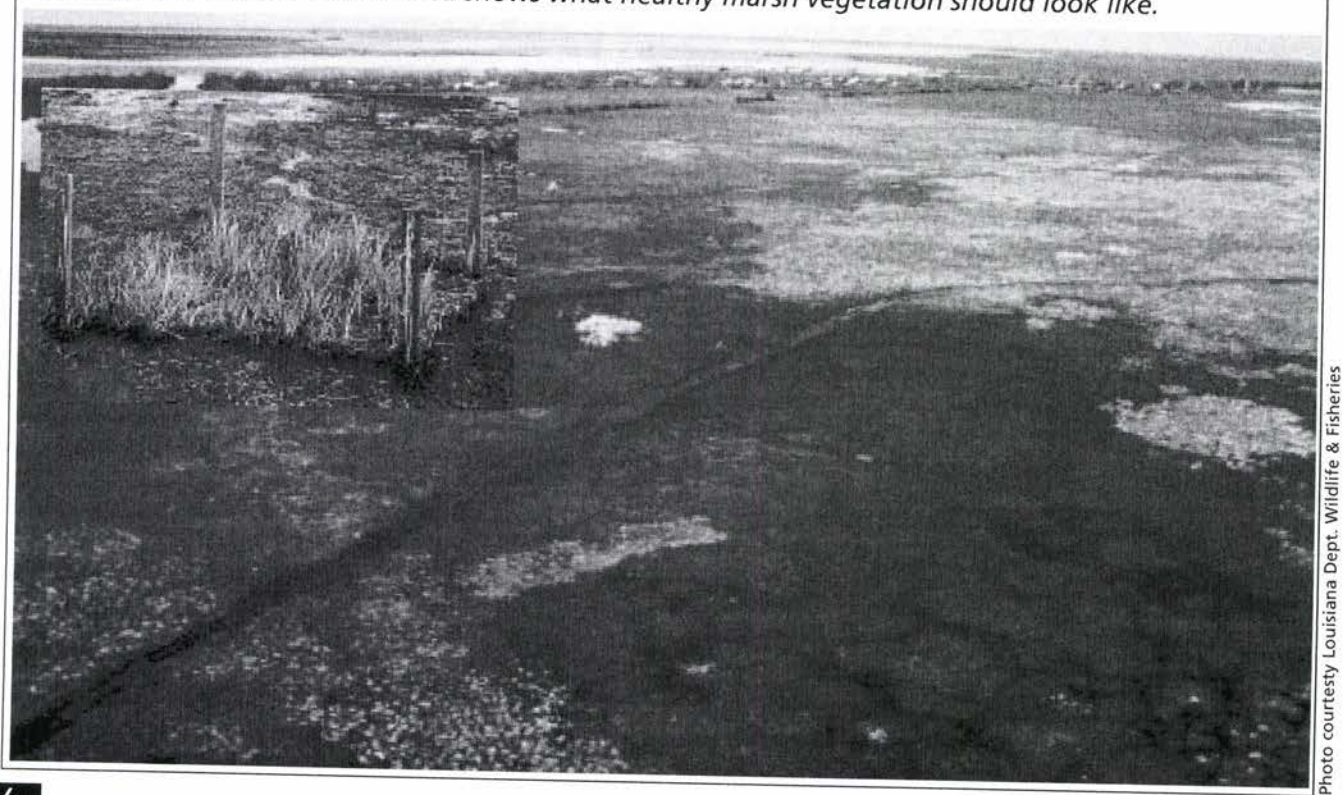


Photo courtesy Louisiana Dept. Wildlife & Fisheries

Photo courtesy Louisiana Dept. Wildlife & Fisheries

Nutria are large, semi-aquatic rodents with prodigious appetites. Regulated trapping of nutria helps prevent erosion of fragile wetlands while providing trappers with valuable food and fur.

number of eat-outs and severity of the damage continue to increase, with only a small portion of the damaged acres demonstrating vegetation recovery. In 2000, wetland damage in Louisiana attributable to nutria was conservatively estimated to exceed 100,000 acres. The estimate is conservative because only the worst, most obvious damage can be detected from aerial surveys. The number of acres being impacted is certainly much higher.

The long term effect of these eat-outs is permanent. Vegetation damage caused by overpopulation of nutria aggravates other erosional processes. Coastal marshes are being lost at an alarming rate as a result of erosion, subsidence (lowering of land), saltwater intrusion, and the lack of silt-laden river water available to continue the process of marsh-building. Once gone, these acres of productive marsh cannot be replaced, and all their positive benefits and values are lost with them. Nutria also cause damage to rice and sugarcane fields, as well as to drainage canal dikes and roadways. In some areas they have severely reduced success of wetland restoration efforts by feeding on planted grasses and trees.

Because of the tremendous destruction of this important habitat type that is home to literally hundreds of species of birds, mammals, reptiles and amphibians, control of nutria is among the top priorities of the Louisiana Department of Wildlife and Fisheries (LDWF). Regulated trapping is the predominant method used in management of nutria populations. Licensed trappers harvest nutria during regulated seasons. If nutria are valuable enough, licensed trapper effort — and therefore nutria harvest — increases, resulting in reduced herbivory damage to the coastal wetlands.

To enhance this economic incentive, the LDWF has taken two approaches. One has been to develop a market for nutria pelts, and the second is to develop a market for the human consumption of nutria meat. The sale of the pelt for clothing, and the additional sale of nutria meat for human consumption, can provide a valuable additional incentive to keep more licensed trappers in the marsh helping to maintain nutria populations in balance with habitat. In the past, the harvest of nutria during regulated seasons in the fall and winter months has resulted in harvests between 390,000 to over 1 million nutria annually. Such controlled and managed utilization of wildlife allows managers to protect coastal wetlands by keeping nutria populations at levels suitable with existing habitat conditions.

The importance of the regulated harvest of nutria cannot be overstated: between 1962-1981 over one million nutria were harvested each year in Louisiana. During this time there was no damage to coastal wetlands. When changing market prices result in lower nutria harvests, coastal wetland damage from nutria becomes a problem. Alternatives to using regulated trappers to control nutria can be costly (if even practical) to society.

Photo by Bill Byrne

A red fox displays the fatal results of sarcoptic mange. The disease is density-dependent in that the mites which cause it must be spread by direct contact with an infected animal or its bedding. When population densities are high, animals come into contact more frequently, and diseases such as mange spread rapidly.

Disease Control

The influence of trapping on the occurrence and spread of wildlife diseases has not been established definitively, despite claims by both opponents and proponents of trapping. However, disease occurrence in wildlife populations is often associated with high densities of animals.[9] Reducing local densities of furbearer populations through harvests can reduce disease transmission and potential for human contact. While the disease may persist in the population, the intensity of outbreaks may be reduced. In a study conducted in Canada, severity of fox rabies outbreaks were reduced by heavy, government-funded trapping, while normal fur harvests showed little effect. However, it was also noted that high levels of regular trapper harvest in southern Ontario decreased the severity, if not the frequency, of rabies outbreaks in red foxes.[10] Intensive, government-funded trapping was also shown effective in controlling an epizootic of skunk rabies in Alberta.[11]

The only definitive statements that may be made on the subject of disease control at this time are that regulated trapping will not (and is not designed to) eradicate diseases; very intensive trapping may help control diseases; and the relationship of normal harvests to disease occurrence and intensity in wildlife populations is not yet well understood.

Regulated Trapping on National Wildlife Refuges

In 1903, President Theodore Roosevelt ordered that a small shell- and mangrove-covered island in Florida's Indian River be forever protected as a "preserve and breeding grounds for native birds." Paul Kroegel, a sometime boat builder, cook and orange grower, was hired to watch over this three acre sanctuary. His mission was clear: *protect the island's pelicans from poachers and plume hunters.* With this simple promise of wildlife protection, the National Wildlife Refuge System was formed.

The System now encompasses more than 92 million acres in the United States managed by the U.S. Fish and Wildlife Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas and other designations for the protection and conservation of fish and wildlife, including those that are threatened with extinction. The mission of the National Wildlife Refuge System is:

Photo by Tom Decker

"To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."

Regulated trapping is recognized as a legitimate activity and sustainable use of wildlife resources within the Refuge System, and has been an important tool for the accomplishment of refuge management and restoration programs for many years. A comprehensive evaluation of Refuge trapping programs conducted by the Service in 1997 documented the importance of this activity in helping Refuges meet the mission stated above. The study examined mammal trapping programs on the Refuge System that occurred between 1992 and 1996.[12] The study identified 487 mammal trapping programs on 281 National Wildlife Refuges during the 5-year period. The Service report went on to say **"This report demonstrates the importance of trapping as a professional wildlife management tool"** and **"Mammal trapping also provided important benefits for public health and safety and recreational, commercial, and subsistence opportunities for the public during the period."**

Eleven reasons for trapping on Refuges were identified in the following order (most common to least common): recreation/commercial/subsistence, facilities protection, migratory bird predation, research, surveys/monitoring, habitat protection, endangered species predation, public safety, feral animal control, population management, and disease control. A variety of trap types were used in these programs: quick-kill traps were used on 171 refuges, cage traps were used on 157 refuges, foothold traps were used on 140 refuges, snares were used on 74 refuges, and other devices were used on 66 refuges.

The variety of trap types used reflects the diversity of environmental and weather conditions; refuge-specific needs, objectives and regulations; and of course the different wildlife species which are found from the Arctic National Wildlife Refuge in Alaska to wetland areas of Gulf Coast Refuges to the forest lands of Refuges in Maine. Trapping activities on Refuges are regulated; the public who participate are required to be licensed and to follow many enforced rules to ensure that their activities are conducted appropriately and in accordance with existing laws and regulations.

Photo by Benjamin Tuller NYDEC

The Facts on Regulated Trapping

People have continuously used furbearers in North America for clothing, food and religious ceremonies for the past 11,000 years. Fur resources had a greater influence than any other factor on European settlement and exploration of the continent. Many cities and towns in North America, including Quebec, P.Q., Albany, NY, Chicago, IL, St.Louis, MO and Springfield, MA, were founded as fur trading centers where Europeans bartered with Native Americans for furs. The trapping and trading of furbearer resources is a heritage that still continues as an important component in the lifestyles of many people in our society. Whether in an industrial, urban, rural, or remote setting, trapping and fur are still of cultural and economic importance and furbearers continue to be utilized and managed as valuable renewable natural resources.

The economic impact of managing furbearer resources is enormous: the multi-billion dollar fur industry annually generates millions of dollars to North American trapper households, wholesalers, processors, garment makers and the retail clothing industry. There are also economic values derived from reduced damage to property and agriculture; personal uses of fur, hides, meat and other products; license revenues; goods and services sold to the public who trap and hunt; and the enhancement of economic activity and the redistribution of wealth into rural communities. Many remote communities in Alaska and northern Canada are dependent on the sale of pelts.[13] Trappers in South Carolina report that 9.3 percent of their family income is derived from trapping.[14] The food value of furbearers can be equal to or greater than the market value of their pelts. Even in an industrialized state like Massachusetts, 28% of trappers report they use furbearers as a food source for themselves or their pets.[15]

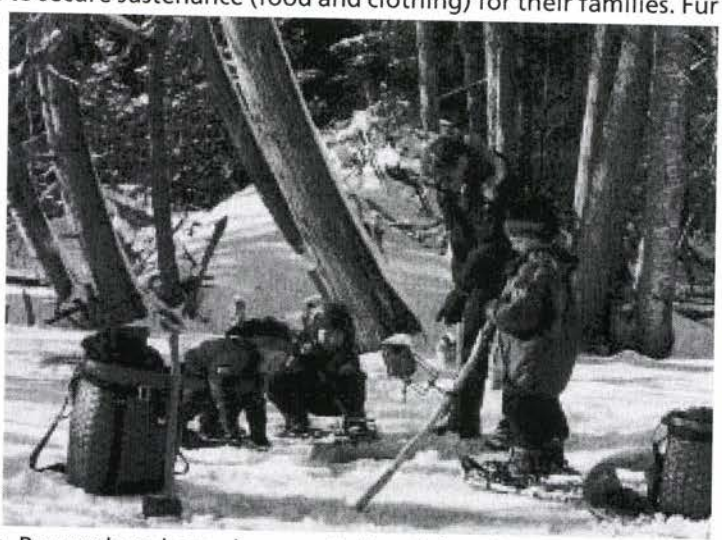
In addition to economic values, trapping has many social values. In Vermont for example, gardening, child care, fire wood gathering, harvesting of wild

Trapping is a Lifestyle

Historically, people in the United States and Canada looked to the land to secure food and provide for their households. Being independent, self-sufficient and hard working, providing for one's family, being a steward of the land — these values and lifestyles are traditionally and distinctly part of the fabric of our society and culture, and they remain present today.

Trapping is an annual seasonal activity in which many people in North America currently participate. Sociologists and other researchers have begun to document the importance of trapping in the lives of these people who still look to the land — including the utilization of wildlife — as part of their lifestyle. This lifestyle is often not understood by the larger segment of society whose members no longer hunt, trap, fish, raise their own vegetables, cut their own firewood or look to the land in other ways to provide for their households.

People who trap in the arctic and sub-arctic regions of the continent often fit our image of traditional trappers. In Canada and Alaska more than 35,000 aboriginal people participate in the trapping of furbearers. These trappers are motivated by the need to secure sustenance (food and clothing) for their families. Fur trapping can be particularly important to them due to the remoteness of their communities, and may provide an essential source of income during certain times of the year. Many of the cultural values and traditions of these people are passed along from generation to generation through the seasonal rituals of trapping. Trapping teaches their youths survival and subsistence skills and provides a meaningful fall and winter activity that helps instill a sense of responsibility to their families and communities.



The attitudes of trappers in the more developed areas of North America mirror the motives of their northern contemporaries. Approximately 270,000 families in the United States and Canada derive some income from trapping, but households that embrace a trapping lifestyle are often not apparent in suburban areas with a diverse mix of cultures. Researchers have documented and described a very vibrant trapping culture even within the urbanized northeastern United States. People who trap in this region list several motives for why they participate in trapping: lifestyle orientation, nature appreciation, wildlife management, affiliation with other people, self-sufficiency, and income (sometimes complimentary, sometimes critical, to the household budget). A universal theme expressed by many trappers is that trapping is a principal component of their lifestyle: it defines them and has deep meaning as an enduring, central life interest.

Trapping in today's society has often been referred to as "recreational" in the context of a "sport," yet as the sociological studies have revealed, the term is a misnomer. It fails to consider the motives of the hundreds of trappers surveyed. People who trap tend to express strong support for conservation programs and environmental protection. They may also cut firewood, raise their own vegetables, hunt and fish. For these people, the opportunity to harvest fish and wildlife contributes to a sense of self-reliance and independence. Studies in New England and elsewhere reveal that trappers barter furbearer pelts, products and trapping services (to remove nuisance wildlife causing property damage) in exchange for childcare, automobile repair, vegetables and other goods and services.

Whether they are aboriginal people living in Canada and Alaska, or people living in suburban or rural areas of New England, Louisiana, or industrialized southern Ontario, a common link among all trappers is that they value the capability of the land to produce wild animals and plants they can use to bring sustenance into their households (e.g. meat for food, pelts for clothing, and/or money to buy household goods). For many, trapping is an integral part of their life, a link to the land, a crucial element in their relationship to nature. With proper management of wildlife resources, people today can still choose to participate in this lifestyle as societies have done since the beginning of time. This is a unique opportunity and experience for people in the United States and Canada that can no longer be pursued throughout most of Europe or the rest of the industrialized world.[16]

Trapping is Highly Regulated

Within the United States and Canada, state, provincial or territorial fish and wildlife agencies have legal authority and pass laws governing furbearer resources. There are various types of laws that apply to trapping within each jurisdiction, and they are enforced by local environmental police, conservation officers and/or game wardens. Laws that regulate trapping by various means include the following:

- Mandatory licensing of trappers
- Mandatory daily checking of traps
- Mandatory trapper education
- Restricted seasons for trapping
- Restrictions on the size of traps
- Restricted areas for trapping certain species
- Restrictions on the types of traps
- Mandatory tagging of traps to identify owner

Professional wildlife biologists monitor the populations of furbearing animals. Scientific studies are conducted to ensure that these species are managed properly. In addition, research focused on the traps themselves identifies which traps work best with each species, and which need improvements. New and improved traps are continually being developed.

foods, home and automobile maintenance, animal husbandry, and community volunteer work are bartered for trapping and furbearer products in some communities.[17] This "hidden economy" may have social and economic significance in many rural communities all over the continent.

Trapping, along with the heritage and self-sufficient lifestyle it represents, has a cultural and social role in today's society and is much more than a "consumptive use" of wildlife. **Trapping can instill a strong appreciation for wildlife and the environment**. Sociological studies show that trappers have an exceptional degree of factual understanding of animals and are outstanding and unusual in their knowledge of wildlife. Trappers, through their outdoor experience and use and knowledge of wildlife, are unique. The relationship they have with land and wildlife underlies a strong sense of stewardship for the environment.[18]

Traps & Technique

The capture and harvest of furbearers has changed markedly since early times. Modern trapping is not comparable to the reckless exploitation of the 17th, 18th and 19th centuries. Today trapping is heavily regulated, involving some of the most complex laws that deal with wildlife, enforced with stiff fines and penalties that ensure the integrity of the activity. Overall, the regulations are designed to protect furbearer

Environmental Police Officers, Conservation Officers or Game Wardens enforce trapping laws and regulations throughout the United States and Canada.

Photo by Bill Byrne

populations and make trapping as humane and efficient as possible.

Many people unfamiliar with modern trapping think of traps as big, powerful devices with jack-o'-lantern teeth on the jaws. This stereotypical image of the trap is based on the obsolete designs that were used to capture bears many years ago. Those old bear traps are collector items today. Such dangerous and destructive devices have no use in modern fur trapping. Today, sizes and types of traps and their use are regulated, and many sizes and types of traps are no longer allowed. Trappers must check their traps within specific time intervals and are restricted or prohibited from setting traps in certain areas. Most jurisdictions require that live-restraining traps be checked daily.

Basic Trap Designs

Modern traps fall into two main categories: quick-kill type traps and live-holding traps. Kill type traps are designed to quickly kill the captured animal, much like a common mousetrap. Live-holding traps can be separated into cage traps and foothold traps. Cage traps are baited wire enclosures with one or two doors that close and lock when the animal steps on a pan or treadle. They work well for animals that are not averse to entering holes or cages, but are ineffective for capturing wary species such as foxes and coyotes. Cage traps come in a variety of sizes designed to catch animals from mice to raccoons. They are expensive though, bulky, heavy to handle, and are not practical in many trapping situations.

Foothold traps typically have two metal jaws, sometimes covered with rubber, that are closed by springs released when the animal steps on the trigger pan. Other foothold devices — most notably the specialized "EGG" trap (see box, page 24) and passive or spring-loaded snares — are also available for use in certain states and provinces.

Foothold traps

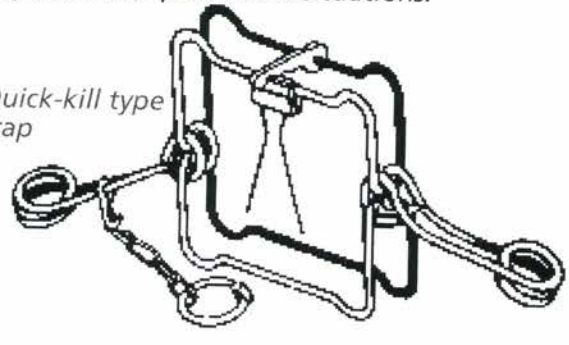
Typical foothold traps are categorized by the type of spring (e.g. coil, jump, or long spring), and are made in different sizes appropriate for catching animals as small as weasels and as large as coyotes and lynx. When set, the jaws of foothold traps range from 3 1/2 to 7 inches in spread. These traps are designed to hold an animal by gripping the toes or foot across or just above the foot pad. This prevents the captured animal from slipping the trap off its foot. As an option, foothold traps can be set submerged to drown a captured animal, and can thereby function as kill traps.

Choosing the Appropriate Trap

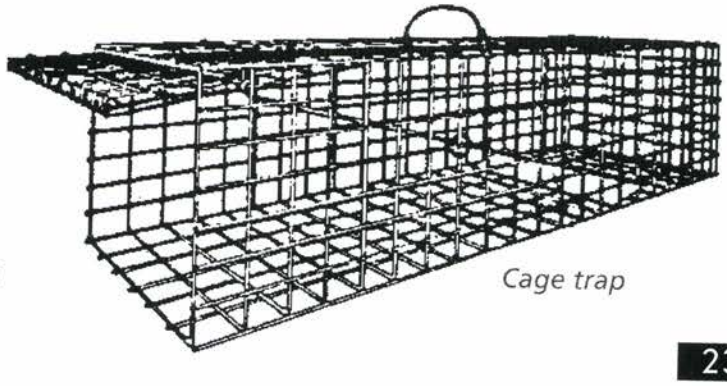
Choice of trap style depends on the specific situation and the furbearer species that is being targeted. Cage traps are an excellent choice for raccoon, skunk

continued, page 25

There are three basic trap designs and many variations of each. Kill-type designs (below, left), also known as quick-killing traps, dispatch furbearers quickly with a hard blow to the head, neck or body, in the same manner that a common mouse trap kills a mouse. Foothold traps (two models above) are live-holding traps that typically have a set of spring-activated jaws designed to close on an animal's foot across or just above the foot pad. Set under water, they can also function as kill traps. Cage traps (below, right) are live holding traps that restrain an animal in a portable cage. Each design is superior to the others for certain applications, species and situations.



Quick-kill type trap



Cage trap

Best Management Practices

Using Science To Identify the Best Traps for Animal Welfare

State fish and wildlife agencies are conducting a national effort to develop Best Management Practices (BMPs) for regulated trapping in the United States. This effort is being made to identify and promote the very best technology available to capture wildlife.[19] These BMPs address five specific points relative to the use and performance of traps. These components are: the welfare of animals, the efficiency of the traps, the selectivity of the traps, the safety of trappers and other members of the public, and the practical application of various types of traps.

BMPs will provide the information that makes a trap and trapper function safely, humanely and efficiently. They will describe the different types of traps, how they work best, how they should be set, and what training may be needed for people who trap with them.

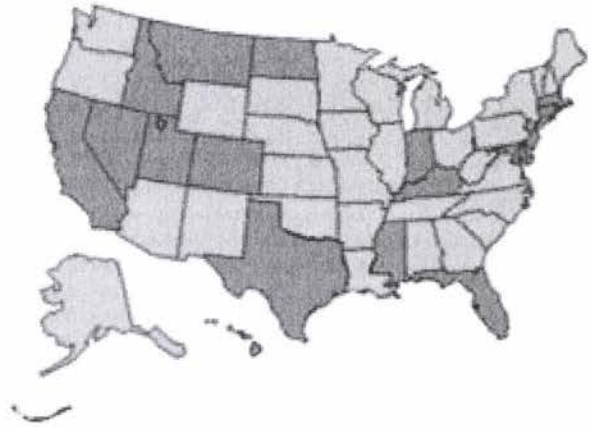
BMPs will be recommended to all state fish and wildlife agencies for incorporation into regulated trapping programs and trapper education programs. There will be BMPs for various regions of the country: the Northeast, Southeast, Midwest, West, and Alaska. A regional approach was adopted to accommodate the differing environmental conditions (such as weather and soil) across the nation, and to address geographical variation in the abundance and variety of wildlife species that may be legally trapped under state regulations.

Testing Traps for BMPs

State wildlife biologists cooperating with specially trained wildlife veterinarians are designing and conducting trap research projects to identify the best traps available. All types of traps are being tested, including cage traps, snares, foothold traps and killing type traps. Current trap testing programs involving more than 32 types of traps are being conducted in many states from Alaska to Maine to Louisiana. In 1997 and 1998 over $1.2 million was spent in the United States on trap testing programs to initiate development of BMPs. The testing is conducted under actual trapping conditions, on working trap lines, by experienced trappers accompanied by professional wildlife technicians.

Everyone — managers, biologists, veterinarians and the public who trap — is interested in using the best technology available for the responsible capture of furbearers. Working towards this goal, state wildlife agencies will persist in their trap research efforts and continue developing BMPs. Basing BMPs on sound scientific and biological data will measurably improve the welfare of captured wildlife in the United States.

In Canada, a similar approach to the Best Management Practices of identifying the best traps available by using science is conducted through a cooperative effort among provincial / territorial wildlife agencies. The Canadian Trap Certification Protocol uses parameters of trap efficiency, humaneness and safety to approve traps for use in Canadian trapping and furbearer management programs. This program is coordinated by provincial wildlife agencies. Under the program, any provincial government authority may certify a trap according to the procedures prescribed in the Protocol. All traps used to capture furbearing species in Canada must be certified according to the Protocol by 2007. The provincial/territorial agencies have agreed that all other authorities will mutually recognize the certification of a trap by any one authority. As trap testing results become available, additional traps will be certified for use in capturing various species.

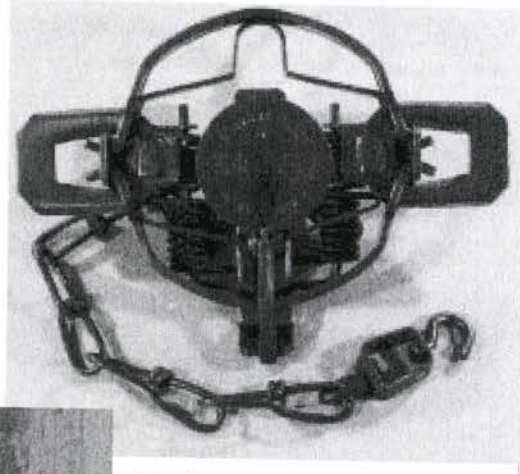


Traps are subjected to intensive scientific evaluation in a continual effort to develop the very best possible designs. To date, 31 state conservation agencies have participated in field evaluations and trap testing. Areas marked in yellow denote states that have participated.

Research & Development

Improving Traps with Science

Wildlife agencies, as well as the public who trap, have long been interested in developing and refining traps and trapping techniques to further improve the welfare of furbearers captured for research, damage control, fur and food. The overriding goal has been to design traps that will hold target species unharmed, or in the case of kill-type traps, dispatch them as quickly as possible. Foothold, snare, cage and kill-type trap designs have all been improved substantially in these respects since the turn of the century, and new and improved models are replacing older designs. While the production of a new trap once required little more than some imagination, engineering and marketing skills, today all trap improvements must be based on sound scientific information.



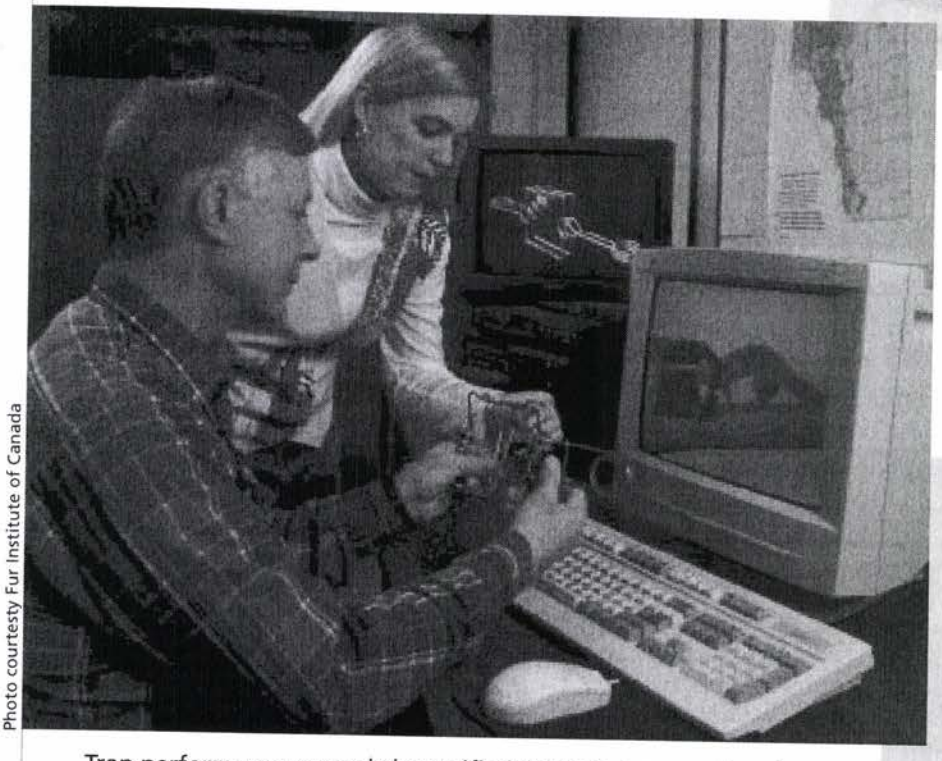
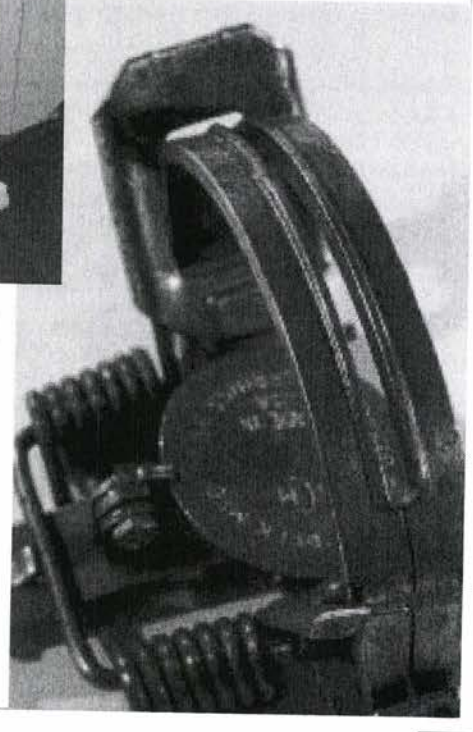


Photo courtesty Fur Institute of Canada

Modern trap evaluation is a comprehensive process that begins with mechanical evaluation, followed by computer simulation (left). Continual research has resulted in design modifications. These include double jaws (above), offset jaws and wide-edge jaws (combined on the trap below).



Trap performance can only be verified through a comprehensive process that evaluates all components of a trapping system. In order to ensure the scientific credibility of results, trap research programs must incorporate appropriate study designs and include rigorous multi-stage testing. Today, various stages of trap research may include: (1) mechanical evaluation of traps; (2) trap performance testing using computer simulation models; (3) study of how animals approach traps; (4) trap performance testing in fenced enclosures; (5) trap performance testing in the field; and finally (6) confirmation tests utilizing independent trappers. Many trap designs have been evaluated to this degree and tested under a variety of conditions throughout the United States and Canada. These evaluation studies have provided important contributions to animal welfare by improving the performance of trapping systems.

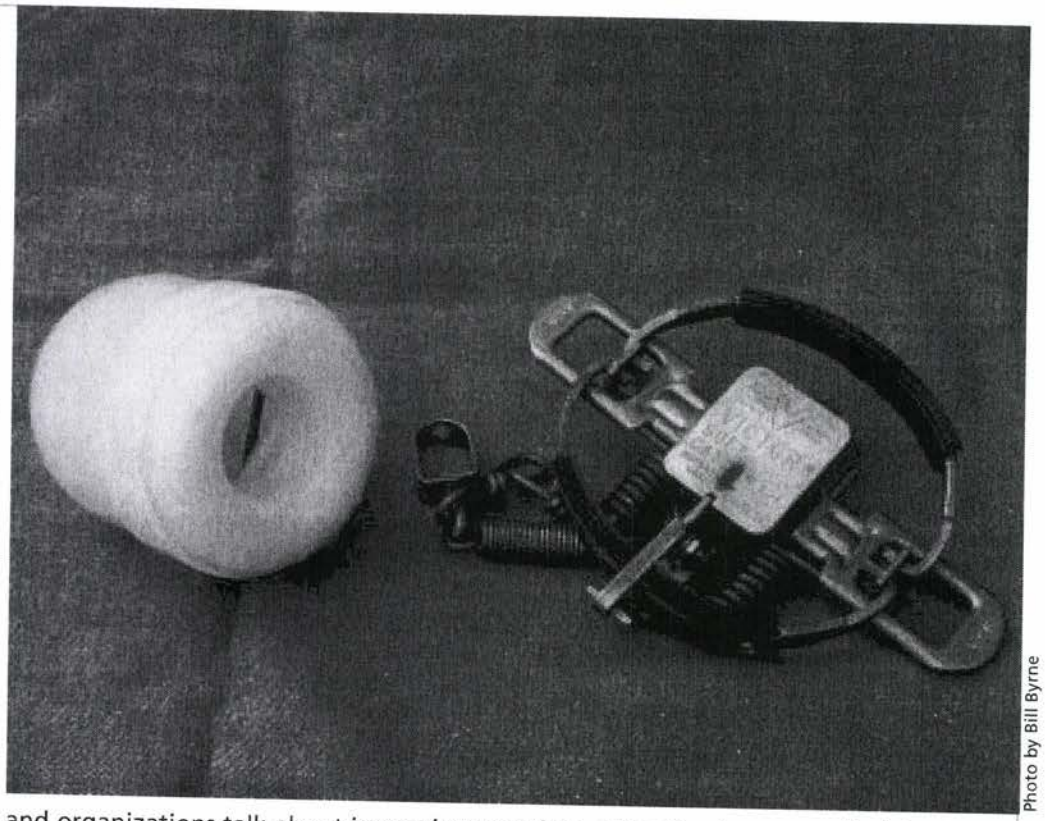


Photo by Bill Byrne

Ongoing scientific research aimed at the development of improved traps has resulted in entirely new designs such as the EGG trap (at left in photo), a modern foothold design used specifically to take raccoons. Soft-catch (at right in photo) is a modern update of a traditional foothold design. This trap system not only incorporates specially padded jaws, but also a shock-absorbing spring and double swivels proven to reduce the chance of injury to captured animals.

While many people and organizations talk about improving trapping, only a few have provided funding for developing new traps and improving older designs. Trap research in North America has been funded jointly by the governments of Canada and the United States, the International Fur Trade Federation, state and provincial wildlife departments, and the Fur Institute of Canada. Wildlife agencies utilize the research findings of trap studies funded by these organizations to assess and incorporate new information into trapping regulations and trapper education programs. While research has provided the information to develop and test entirely new trap designs (such as the "EGG" trap) for particular species, modifications to existing kill traps and foothold traps are also of great importance. Adjusting chain length, adding swivels to the chain, providing for adjustable pan tension, and/or replacing standard jaws with offset, laminated or padded jaws can improve the welfare of captured furbearers, and researchers continue to explore other new and innovative design possibilities. Everyone is interested in using the best technology available for the responsible capture of furbearers.

Performance evaluation and the testing of killing and restraining traps in both the United States and Canada follow methods approved by the International Organization for Standardization (ISO). These testing standards ensure that countries have internationally comparable data for evaluating trap performance. Modern trap evaluation is conducted in a framework that applies science to ensure the use of humane and safe traps whether for scientific study, animal management programs, protection of endangered species, or the sustainable utilization of wildlife resources by the public.

Trap research efforts today are well coordinated among the state and provincial wildlife agencies, cooperative Universities and federal agencies in the United States and Canada. Wildlife biologists, statisticians, engineers and specially trained wildlife technicians oversee trap-testing efforts conducted in North America. In the United States, 31 state wildlife agencies have participated in a coordinated national trap-testing program. In addition, the United States Department of Agriculture Wildlife Services program has conducted important research on improving trapping devices. In Canada, trap-performance testing, research and development is conducted by the Trap Research and Development Committee (TRDC) of the Fur Institute of Canada (FIC) with participation of provincial/territorial wildlife agencies and trappers. Much of this work is conducted at the Alberta Research Council in Vegreville Alberta, the most comprehensive and extensive trap research center in the world. Trap evaluation and testing programs under field conditions are often conducted in cooperation with provincial/territorial wildlife agencies and cooperating trappers. Research findings from the FIC-TRDC program are used both in the United States and Canada.

and opossum when trapping near residential areas in wildlife damage management situations. Quick-kill type traps — or body-gripping traps as they are sometimes called — are very effective when used for marten, mink, fisher, muskrat, otter and beaver. Kill-type traps are considered to be efficient and humane because animals rarely escape, and loss of consciousness and death are rapid. However, kill-type traps do not allow for release of "nontarget" animals (animals the trapper does not want to harvest). Also, fox and coyotes will rarely enter kill-type traps. For these species especially, foothold traps remain the most effective trap (and allow for release of nontarget animals).

Foothold traps do not have to be big and powerful in order to hold an animal. **A foothold trap of the right size, correctly set, will typically catch and hold the target animal without significant injury.**

Trappers Are Selective

The placement of the trap in relation to the lure and/or bait (as well as the type of bait or lure) greatly affects the selectivity of the trap set. An effective trapper wants to catch the animal targeted, instead of a nontarget species. Knowledge of animal behavior allows placement of traps on the target animal's line of travel such that, in many cases, the trapper needs no bait or lure at the set (blind set). Different lures used at other sets are usually attractive only to certain species of furbearers, and can be used to draw the target animals to the set. Trappers strive for enough knowledge of the target animal's habits to allow efficient capture while avoiding nontarget animals. This is the essence and challenge of trapping. The personal satisfaction and even the economic return depend on having this knowledge and efficiency (see "Trapper Education" page 26). With the selection of the right size trap, trapping location, the correct setting of pan tension, and the proper use of the device in concert with lure and bait, trappers are extremely selective in what species their traps will capture. So, while traps as devices

Foothold traps need not be large to be effective, as demonstrated by the trap used to capture this coyote. Foothold traps typically capture and hold animals without significant injury and have been used to capture river otter and gray wolves (below) for reintroduction and restoration efforts in portions of the United States. The foothold trap is the only effective device, except for snares, for capturing certain furbearers such as coyote, wolves, and foxes.

Photo by Dan Harrison

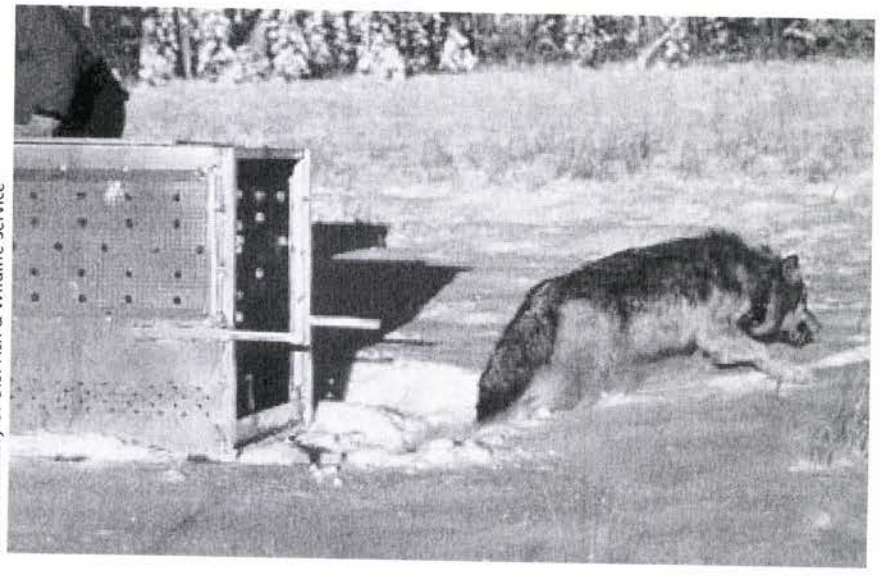


Photo courtesy of U.S. Fish & Wildlife Service

Photo courtesy of New York State Dept. of Environmental Conservation

The art of trapping is often a family tradition, handed down from generation to generation.

have some degree of selectivity, trappers further improve that selectivity.

Concern has been expressed over the relative risks of trapping to pets. As stated above, proper trap selection and placement will minimize nontarget captures. Trappers generally seek landowner permission (required in many jurisdictions) when trapping on private land, and scout for animal sign and presence before the trapping season. Most trappers avoid areas with evidence of domestic animal use because it interferes with opportunities to capture target species. Pets that are allowed to range freely and unsupervised are at greater risk from predators, automobiles and other health threats than they are from traps. Regardless, in the few instances when pets or domestic animals are accidently caught in foothold or box traps, they can usually be released unharmed.[20]

Trapper Education

There was a time when new or young trappers could easily find a friend or relative to teach them how to trap. To become effective, the trapper must learn animal behavior, wildlife habitat, types of traps, trap preparation, sets and lures for different animals, and care of the pelts. This knowledge allows the trapper to become efficient; that is, to be able to set the

Acquiring the base knowledge from experienced trappers starts beginners off right. To ensure that all new trappers know the proper skills and understand the activity, its many regulations, and their role in scientific wildlife management, first-time trappers in many states and all Canadian provinces and territories are now required to complete an official trapper education program.

Photo by Bill Byrne

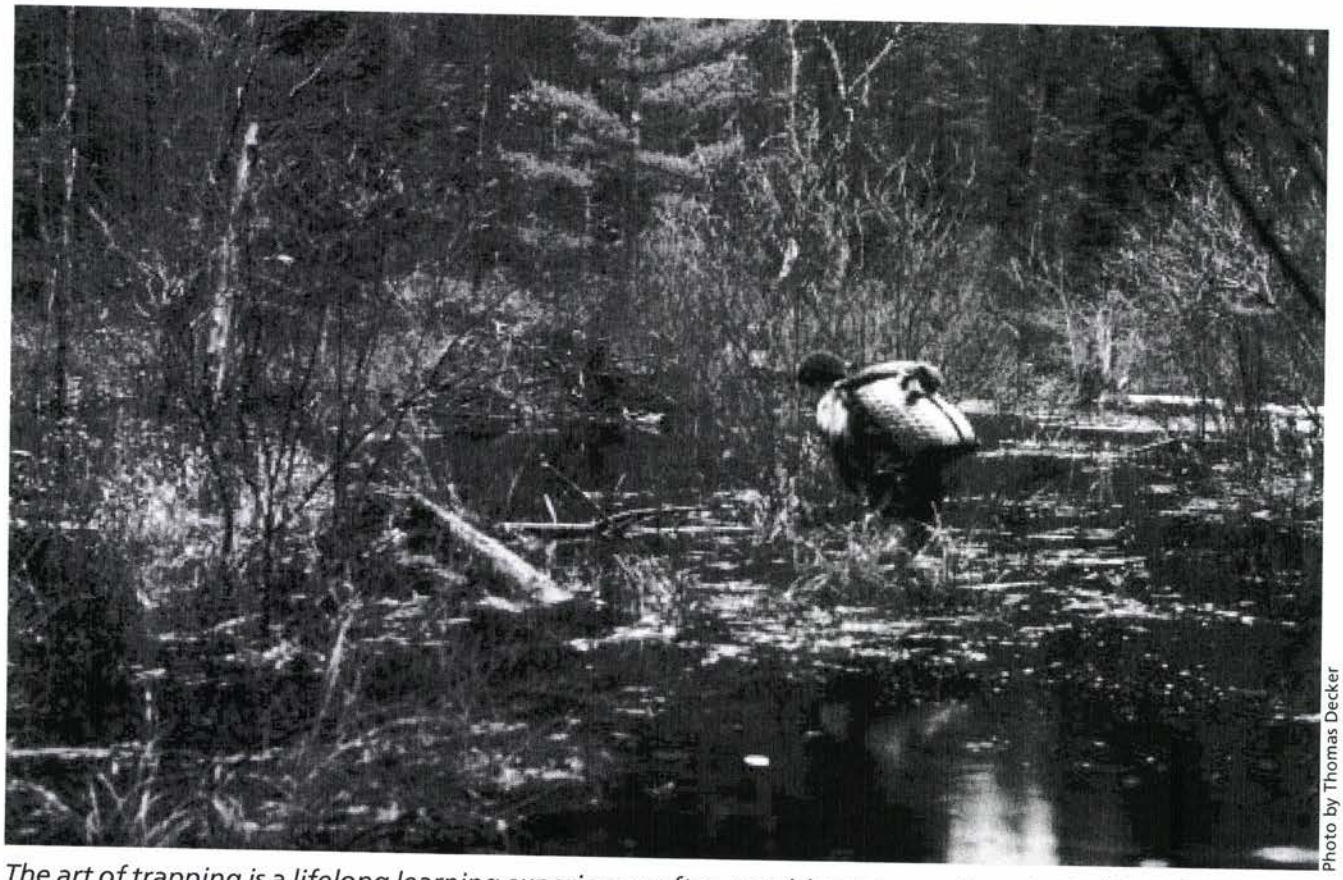


Photo by Thomas Decker

The art of trapping is a lifelong learning experience, often requiring trappers to enter habitats few people ever visit. Trapping may instill a strong appreciation toward wildlife and the environment. It typically fosters an exceptional understanding and knowledge of animals and a close relationship with the land.

Values* Of Furbearers

Economic Values:

Many people benefit economically from the use of furs and other furbearer products.

Many people suffer economic loss from damage or depredation caused by furbearers.

Ecological Values:

Furbearers as predators and as prey help keep ecosystems in balance.

When ecosystems become unbalanced and the existence of certain species is endangered, predation by furbearers may increase their risk of extinction.

Beaver, and to a lesser extent, muskrats, alter habitat, often to the benefit of many other wildlife species. They, along with nutria, can also degrade habitat to the detriment of fish and other wildlife.

Cultural Values:

Trapping is a part of our cultural heritage. Its traditional skills, including respect for and knowledge of the outdoors, are passed along in many families from generation to generation.

Some members of the public retain a cultural heritage of utilizing furbearer meat to directly sustain their families and pets. Many use furbearer products and trapping to barter for other essentials.

Biological Values:

Furbearers can help us better understand human health problems, such as effects of environmental pollutants.

Furbearers can pose risks to humans through exposure to diseases and parasites.

Aesthetic Values:

Many people enjoy fur and furbearers.

Many people enjoy observing furbearers and their works (beaver ponds).

*Values can be both positive and negative.

Selectivity of the Trap-Trapper Unit

A trap is a mechanical device that, once set, will close only on objects heavy enough to release the trigger. Observing this, those unfamiliar with trapping may assume that traps are not selective; that they will catch anything. This is not a correct assumption unless the trapper — the person required to set the inanimate device in the first place — is removed from consideration. Trap and trapper are part of the same equation; one cannot function without the other. Once this relationship is acknowledged, it is recognized that the trap-trapper unit is actually very selective in terms of what it will catch. Regulated trappers and wildlife researchers invariably set their traps in such a way that only the species (or sometimes even only the *individual* animal) they are targeting is likely to be captured. The numerous techniques trappers use to ensure their trap sets are selective include the following:

- **Location:** Where a trap is located determines to a great extent what animals are likely to enter it. Traps may be located underwater, in trees, near den sites, travel routes and loafing areas, or within other specific habitat types where nontarget species are never found or are unlikely to be found.
- **Type of Trap:** The use of certain types of traps virtually eliminates the chance that certain species will be captured. Foxes and coyotes, for instance, will rarely enter cage or kill-type traps.
- **Size of Trap:** The size of the trap determines to some extent what size animals it will capture.
- **Pan Tension:** Pan or trigger tension is adjustable on many traps. As a result, traps are often set so that only relatively heavy animals (such as beavers or coyotes) can spring them.
- **Lure or Bait:** Specific baits and lures, often used in conjunction with trap sets, are attractive to specific species of animals. Sweet corn, for instance, is attractive to raccoons, but not to bobcats. Lures in the form of urine or scent gland extracts are particularly attractive to the species from which the scent is derived; may even repel other species.
- **Position of Trigger:** Trigger configuration on kill-type traps can be set to allow nontarget species to pass through without setting off the trap.
- **Trap Set:** How a trap is handled or placed influences what animals can be captured. Wary species will avoid any trace of human scent, while others such as raccoons and skunks may be attracted to it. Fencing or other obstructions placed around a trap can prevent some species from approaching the trap.
- **Timing:** The timing of when traps are set during the trapping season can influence which gender and what age class of animals will be captured.

These same elements, all of which make traps highly selective in terms of what animals they will capture, are used not only in fur harvest trapping, but also in the live capture of animals for research and conservation programs, and for problem animal control and property damage situations.

proper trap in the appropriate manner and catch the intended animal. Certainly trappers are continually learning, but there is a base level of knowledge that is much easier to learn from an experienced trapper than by trial and error on one's own. Trapper education programs have been instituted in many states and all Canadian provinces and territories to ensure that beginning trappers acquire this fundamental knowledge before they set traps on their own.

Trapper education programs teach basic trapping techniques in both field and classroom situations with a strong focus on the responsible treatment of animals, trapping regulations, the avoidance of nontarget animals, safety, selective trapping, trespass laws and ethical trapper behavior. Trappers are taught how to select and set the smallest and most effective traps for whatever furbearer species they wish to target. These programs are strongly supported by experienced trappers who often teach the courses in conjunction with wildlife agency personnel. The ethical and even spiritual ideals of trapping — to take every animal with dignity, admiration and respect — are widely embraced. Information taught to beginning trappers provides them with a larger view of their role and the importance of trapping in an effective, responsible, and ethical manner.

Trapping and Public Safety

Opponents of trapping frequently charge that people, especially children, are in danger of being caught and injured in traps. These charges naturally tend to heighten public concern about trapping. However, a nationwide search for all recorded incidents of human injuries resulting from traps during the past 20 years documented only three that were associated with legal fur trapping.[21] None resulted in serious injury. Trapping does not threaten public safety because the size, placement and use of traps are regulated to ensure the safety of humans and animals (see box, page 20).

Furbearer Management Options

The use of traps and trapping in furbearer management programs other than traditional fur harvesting can be divided into three major categories: **Wildlife Damage Management**, **Wildlife Research**, and **Reintroduction of Extirpated Wildlife**. Among these categories, which may be broad or narrow in geographic scope, there are a number of options, along with trapping, that wildlife biologists can consider to achieve the management objective. Selection of any option must take into account its practicality, effectiveness, legality, safety and cost. Typically, a combination of two or more techniques is used in most management situations in order to achieve maximum effectiveness and cost efficiency. The various technique options available to wildlife biologists for the three categories of furbearer management programs are presented below:

Options for Wildlife Damage Management

Wildlife damage management is typically undertaken as a response to a citizen's concerns over animals causing loss or other damage to personal property or resources. Livestock predation by coyotes and foxes, flooding by beavers, and agricultural crop damage by raccoons and muskrats are common examples of wildlife damage. Several management options, both lethal and nonlethal, are available, but no single method or combination of methods is applicable in all damage situations.[22] Management options to curtail various forms of wildlife damage include the following:

Guard Animals

Animals, such as guard dogs, llamas and donkeys, have been used to protect livestock from coyotes and other predators. Guard dogs are typically special breeds, such as Great Pyrenees and Komondor, that are imprinted after birth on the livestock breed they are assigned to protect. Neutered males are most commonly used. Success has been achieved in some areas with guard dogs, although they are expensive and last an average of only 3.3 years due to the rigors of life in the outdoors. Their effectiveness is best in a paddock situation, and diminishes on open pastures. Use of guard dogs can require a great deal of attention by the herder, particularly on an open range, where more effort is required to ensure the dog is properly fed and attended. Guard dogs may indiscriminately kill other species of wildlife (such as deer fawns) they encounter.[23]

Llamas and donkeys have an advantage over dogs in longevity and feeding, but have also been documented injuring and killing sheep. More research and experimentation is necessary before their effectiveness can be fully evaluated.[24]

Risk to humans from all types of guarding animals can increase a livestock owner's liability.

Exclusion / Habitat Modification

There are a number of management techniques that, under the proper conditions and with adequate funding for installation and routine maintenance, can be used to prevent or reduce various types of wildlife damage:

Water Flow Devices and Exclusionary Fencing: Specially designed "beaver pipes" are placed in road culverts or through beaver dams to reduce water level and associated flooding. These pipes must be placed in such a manner that the beaver cannot sense the sound or flow of water (which triggers their instinct to dam the flow), or must have adequate baffles to prevent the animals from blocking the flow. In situations where the gradient allows installation and function, beaver pipes can be effective at reducing beaver flooding. The devices may be expensive, however, and require routine cleaning and maintenance. Site characteristics may nullify the effectiveness of these devices in some situations.[25]

Exclusionary fencing can be installed in front of, or around, the intake of road culverts to physically prevent beaver from plugging the culverts. Exclusionary apparatus is a preventive measure that varies markedly in expense and ease of installation, requires regular maintanance, and does not regulate water level.[26]

Livestock Fencing: Permanent or portable fencing, including electric fencing, can be used as a barrier to prevent predators from killing or damaging livestock. Fencing must be a minimum of 5.5 to 6 feet high and frequently maintained in order to exclude coyotes.[27] The cost of fencing has limited its application because many people who own sheep or other livestock simply cannot afford to fence an area large enough to adequately pasture their animals.

Photo by Guy Connolly USDA/APHIS

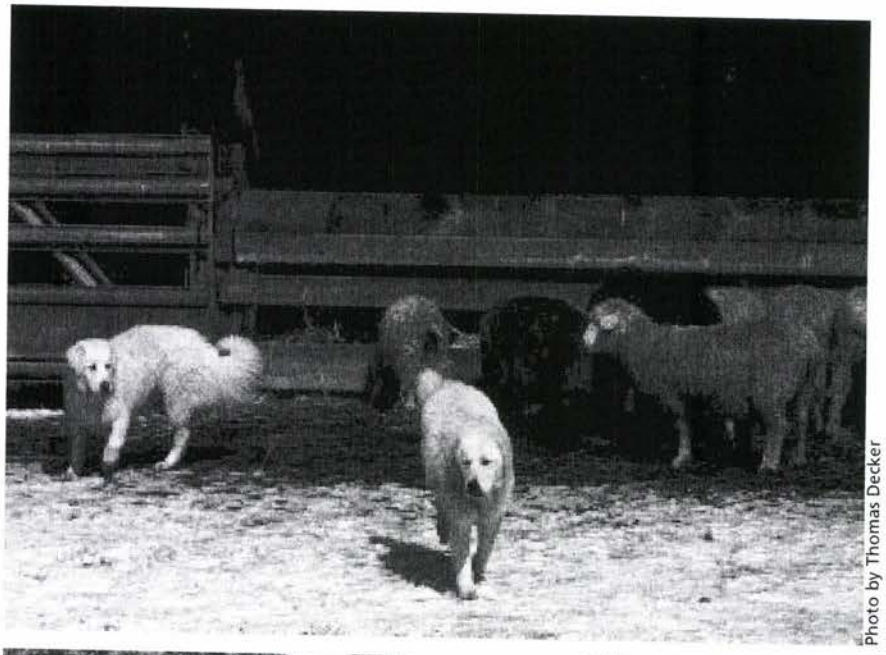


Photo by Thomas Decker

Photo by Bill Byrne

There are many options to deal with damage caused by furbearers, but the effectiveness, efficiency, and cost associated with a particular option will determine its appropriateness for a given damage situation. When coyotes kill sheep and other livestock , farmers may resort to fencing (exclusion), but it must be tall, or it will be ineffective (above). When fencing is impractical (as it can be due to cost) specially bred guard dogs (above, right) or other guard animals are options, but these too have their drawbacks (see text). A well constructed baffle pipe (right) can help control flooding damage caused by beaver, but it requires regular maintenance and will not work in many situations.

Contraception

Past research has shown that hormone injections or implants can be successful in controlling the reproduction of individual animals. The technique requires repeated injections or surgery; consequently it is extremely expensive and difficult to apply to large numbers of animals. Some fish and wildlife agencies and animal welfare groups are now supporting research to develop a wildlife contraceptive that is inexpensive, relatively easy to administer, and long lasting. New advances in genetic engineering have opened the door to *immunocontraception* as a possible solution. Immunocontraception uses vaccines that target specific hormones or reproductive tissues. This research is in its infancy, and field experiments have been limited. While immunocontraception may have some value as a wildlife management tool in the future, it is not available today and will remain a rudimentary tool in the near future.[28] To put this in perspective, zoo veterinarians and reproductive biologists interested in controlling the reproduction of captive animals have not yet developed an effective contraceptive vaccine for most species. Some of the technical problems include:

- Safe and effective application requires animals to be individually vaccinated.
- Delivery systems (e.g. dart guns and blow guns) have limited range, making it necessary to get within close range of every animal targeted for the vaccine.
- Two or more boosters may be required to cause infertility.
- Application that would be extensive or effective enough to control population growth may never be possible.
- Legal hurdles of government environmental and drug regulatory agencies and assessment of overall environmental impacts may delay availability for many years.

Most wildlife damage situations require immediate control of offending animals. Immunocontraception will not eliminate damage in the short term: sterile beavers still have functional teeth and will cut trees and build dams.

Oral Vaccines

There are several active programs developing and testing oral vaccines for the purpose of reducing the number of terrestrial mammals infected with rabies. Oral vaccines designed to prevent rabies in coyotes, raccoons and foxes have shown promising results during experimental trials in the U.S., and have been used successfully in Canada. Ongoing field tests will continue to refine our understanding of the benefits and drawbacks of oral vaccines.

Questions regarding the safety, cost, and overall effectiveness of this technique in limiting the spread of rabies still remain, but when used in conjunction with trap-vaccinate and trap-euthanize programs around local outbreaks of raccoon rabies, it appears to be effective in limiting the spread of the disease.[29]

The control of rabies and/or other communicable wildlife diseases would also remove a natural limiting factor of predator populations. This may impact prey populations (turtles and migrant songbirds for example) that may have evolved reproductive strategies to take advantage of periodic, disease-induced declines in predator density.

Toxicants

The use of toxicants (poisons) to control wildlife damage involves killing animals causing damage with specific, Environmental Protection Agency-registered pesticides. Historically common in use, toxicants were misused widely enough to create public concern that has now greatly restricted their availability and use.[30] There is a great deal of variation in how individual states and provinces regulate and control toxicant application, in addition to federal oversight. There are some toxicants that can be applied by private citizens, but concerns over public health and safety and nontarget animal exposure restrict many applications to licensed government officials. Despite limited use, toxicants remain a valuable tool to wildlife managers for special projects and emergency situations.

Shooting

Shooting the depredating animal or animals requires one or more shooters to stake out the area where the damage is occurring. Shooting can be a highly selective control method, provided that the shooter correctly identifies the offending animal, and is positioned for an accurate, killing shot. Shooting nocturnal animals such as coyotes, raccoons and beavers is difficult and may require expensive night vision equipment to maximize efficiency. Shooters — particularly those targeting coyotes — must also be skilled hunters: the wary nature of the animals requires a shooter to have considerable knowledge of the animal's sign and habits in order to be in position for a shot without the animal being aware of the shooter's presence. Shooting often requires several days of effort for each damage situation, making it costly and limiting the number of damage situations that can be dealt with. Where damage occurs in close proximity to roads or buildings, shooting may not be a legal option, particularly at night.

Trapping

Use of traps to solve wildlife damage problems involves the capture of the animal or animals causing damage. The effectiveness of trapping to solve wildlife damage problems can depend on the skill and experience of the trapper. Knowledge is required to accurately determine what species is causing the damage; what trap type is required to ensure effective capture with minimal potential for injury to the animals; and where and how the trap(s) should be placed so as not to capture nontarget species. Trapping does not require the trapper to be present when the damage occurs, allowing several damage situations to be addressed simultaneously. If the species causing damage is a furbearer and the damage occurs during the legal fur trapping season, a licensed fur trapper may be willing to remove

the offending animals at no cost. If foothold or cage traps are used, the trapper has the discretion of releasing trapped animals unharmed.

Traps used by either agency personnel or registered trappers recruited to assist with programs, may be used in conjunction with other techniques to address wildlife damage problems. Trappers from Ontario have played a key role in efforts to prevent the spread of raccoon-strain rabies into Ontario.

No Action / Tolerance

This would be a decision to let the damage occur uncontested; "live with the damage" so to speak. Such a decision would have to balance many factors. In some cases, the wetlands created by beaver provide valuable functions to society and wildlife, and these must be balanced against economic losses to individuals and communities. Rabies outbreaks that periodically reduce certain furbearer populations may temporarily reduce property damage and benefit some wildlife populations (such as birds and turtles that incur heavy nest predation by furbearers), but also present a public health threat requiring public education programs and expensive medical treatment for individuals thought to be exposed to the disease. Ultimately, society's level of tolerance towards wildlife damage will determine where no action can prevail.

An increased public understanding of wildlife natural history and behavior will often lead to a more tolerant view of wildlife. Providing information regarding wildlife species causing damage may decrease the need and urgency for corrective action. However, the magnitude and tolerance of damage is highly variable among the public. Threats to public health and safety or substantial damage to public and private property often reach unacceptable levels. When this threshold is crossed, management techniques must be employed. Wildlife managers do not want to see society's tolerance reach the point that furbearers become perceived as pests and threats, rather than as valuable natural resources that should be enjoyed, appreciated and perpetuated.[31]

Photos by Bill Byrne

A certified trapping instructor demonstrates how to set a quick-kill beaver trap beneath the ice. This set includes a special frame that allows the trapper to raise and lower the trap to various depths.

Options for Wildlife Research

Research on movements, survival rates, habitat use and other life-history factors is often needed to develop management programs to ensure a population's continued existence, or to find solutions to wildlife damage problems. This may require the capture, marking, and immediate release of animals that are subsequently monitored for extensive time periods. Options for capturing wildlife include:

Live-Trapping

Cage Traps: Cage traps are the largest, heaviest, and most expensive capture devices, limiting the number that can realistically be used on any given research project. Though generally less useful than foothold and kill traps, cage traps have proven effective for capturing fisher, marten, raccoon and beaver, less effective for capturing bobcat. They are ineffective for capturing coyotes, foxes, wolves and river otter, although a specially designed cage trap for beaver equipped with additional modifications has had limited success in capturing otter.[32]

Foothold Traps: Foothold traps have proven effective for capturing fisher, marten, bobcat, lynx, mink, raccoon, beaver, river otter, foxes, coyotes and wolves unharmed. In the Northeast, over 343 coyotes, 844 red and gray foxes, 76 bobcats, 49 fishers and 79 river otters have been live-captured with foothold traps and released unharmed during research projects conducted from 1980 to 1994.[33] Eighteen lynx and over 50 coyotes have been captured in foothold traps and released unharmed during 1999 and 2000 in an ongoing research study in Maine. The small size, light weight and relatively low cost of foothold traps makes them highly desirable for field research. Recent advances in foothold trap design and use have enhanced selectivity and minimized injuries related to capture. This includes restraining snares designed to capture and hold animals such as wolves, coyotes and bobcats by the foot or leg.

Chemical Immobilization

Chemical immobilants have been used successfully to safely handle wild animals. In many cases the animals are restrained prior to injection of the chemicals. Restraint methods include trapping the animal or treeing it with hounds. Dart guns, powered by compressed air or powder charges, provide an effective remote delivery system for chemical immobilants, but they are much more limited in range and accuracy than conventional firearms, while having similar constraints (see *Shooting*, page 31). It is generally easier and less costly to capture animals with other techniques. Dart guns are efficient for animals that predictably gather in specific areas.

Alternative to Capture

Techniques that do not involve capturing animals, such as track counts and aerial surveys, typically yield limited information that cannot be used in assessing life-history parameters, and may not be practical to conduct in areas without extensive snow cover. Conversely, direct observation of animals is costly, difficult, and impractical.

Ultimately, if no effort was made to capture wildlife for research or fur harvesting, wildlife biologists would have to rely on information derived from the number of road kills and damage complaints to draw inferences about furbearer population characteristics. This can be analogous to assembling a puzzle with only a few pieces. Management actions would have to be extremely conservative because available information would lack the sensitivity needed to detect shifts in population trends in a timely enough manner to allow responsive actions. An inability to capture wildlife would greatly reduce the ability of government wildlife agencies to meet their public resource protection mandates that have been established by law.

Options for Wildlife Reintroductions

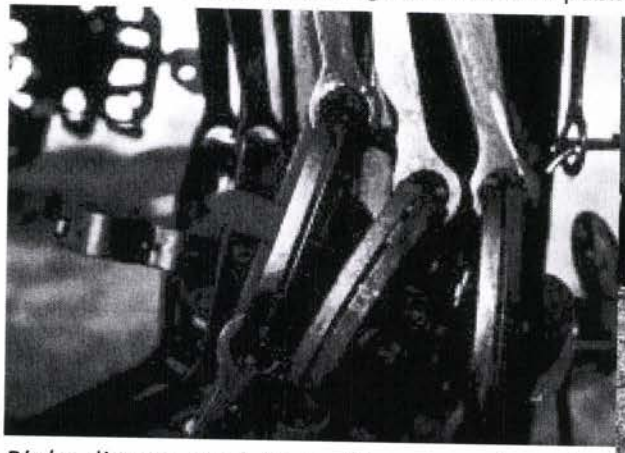
In some areas the public desires to reestablish wildlife species. Fisher, marten, river otter and beaver are some of the species that were once extirpated from many parts of North America and subsequently reintroduced by capturing individuals from areas where they are abundant, and releasing them in suitable but unoccupied habitat. These reintroductions involved the use of foothold and cage-type traps. For instance, since 1976, more than 4,000 river otters have been captured in foothold traps, relocated, and released to restore populations in 18 states.[34] If biologists did not facilitate expansion, species would have to enlarge their current ranges into unoccupied habitat on their own. The length of time necessary for this depends on species mobility and distance. In many cases range expansion is difficult or impossible due to insurmountable geographical features or human-created barriers such as major roadways and urbanized landscapes.

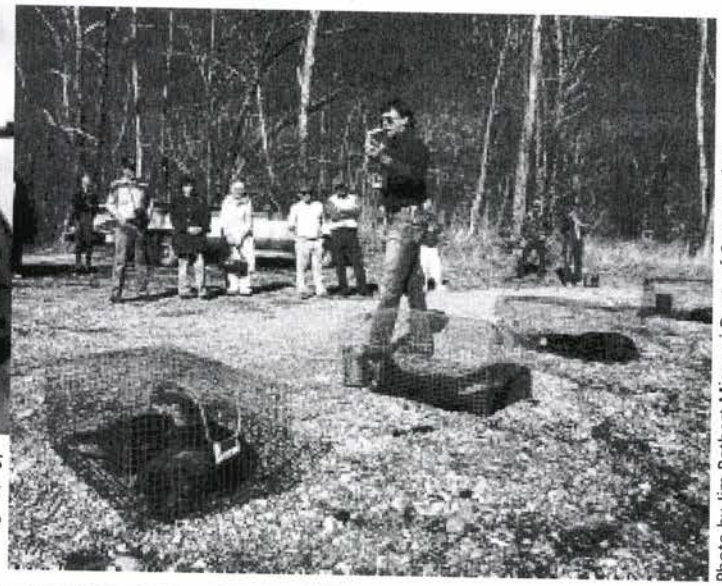
Trapping for Research and Reintroduction Programs

Modern foothold traps have been — and continue to be — used successfully to capture a wide variety of wildlife species in order to study the characteristics of individuals and populations. In fact, research conducted with the use of foothold traps has provided much of the information leading to our present understanding of biological and ecological phenomena. Wildlife biologists typically use these traps to capture animals that are then instrumented with radio-collars and released unharmed. The released animals are then carefully monitored, revealing information on their movements, habitat requirements and reproduction that can be acquired in no other way. The coyote pictured on page 25 is one of many captured with foothold traps, examined and released.

The river otters pictured below were all caught with foothold traps in marshes in Louisiana where they are abundant, and were released unharmed into areas of Missouri to restore otter populations where they no longer occurred. Similar otter restoration programs have been successful in 18 other states including Alaska, Arizona, Colorado, Kentucky, Iowa and New York. Many states now have thriving river otter populations thanks to capture and reintroduction efforts made possible by the use of foothold traps. *These are the same traps used by the public to harvest furbearers.*

Foothold traps and snares are generally the only effective traps for catching elusive species such as wolves, coyotes, foxes and lynx. As a result, they are almost always the trap of choice when any of these famously wary species are targeted for capture by either the public or wildlife researchers. Lynx reintroduced in some western states were captured with foothold traps in Canada (Yukon). Another example is the ongoing, important role foothold traps are playing in the restoration of several endangered wolf populations. Red wolves are captured, examined and relocated to reestablish new populations; Mexican wolves are captured for a captive breeding program that will provide healthy animals for a reintroduction program; and stock-killing gray wolves are captured and relocated to reduce damage and maintain public support for their continuing restoration.





Right, live-trapped river otters are released as part of a restoration program. Foothold traps with offset jaws, above, were used to capture the animals unharmed.

Photo by Jim Rathert Missouri Dept. of Conservation

Otter Restoration Around the Nation

State	No. Released	Years
Missouri	845	1982-1992
Tennessee	487	1983-1994
Kentucky	355	1991-1994
Illinois	346	1994-1997
Indiana	303	1995-1999
North Carolina	267	1990-1995
Iowa	261	1985-1999*
West Virginia	249	1984-1997
Nebraska	159	1986-1991
New York	279	1995-2000*
Ohio	123	1986-1992
Pennsylvania	105	1982-1999*
Colorado	86	1976-1991
Maryland	80	1990-1999*
Arizona	46	1981-1983
Minnesota	21	1980-1982
Oklahoma	20	1984-1985
Kansas	19	1983-1984

*Ongoing Releases

Animal Welfare

The concept of "Animal Rights" is distinct from the concept of "Animal Welfare." Animal Rights is based on personal values and philosophy, while the agenda for Animal Welfare is based on science. The Animal Rights and Animal Welfare agendas represent entirely different perspectives on human/animal coexistence.[35]

Animal Welfare proponents believe that human use of animals is appropriate as long as practical measures are taken to ensure that human use does not cause any undue pain and suffering to animals. Wildlife biologists and all responsible trappers and hunters are staunch supporters of Animal Welfare.

Animal Rights proponents oppose *any* human use of animals. They believe animals have the same rights as humans, and therefore should not be used, eaten or owned by people.[36]

The primary concern of Animal Welfare advocates is the well-being of animals. The primary concern of Animal Rights advocates is the moral obligation of people. The well-being of animals is a secondary concern for Animal Rights advocates.[37]

Professional wildlife biologists advocate Animal Welfare. The International Association of Fish and Wildlife Agencies (IAFWA), noting that "the worldwide growth of the animal rights movement threatens all traditional uses of animals," adopted the following position in 1989:

"The IAFWA acknowledges that humans have an inseparable relationship with all other parts of the natural world. Furthermore, humanity is answerable to another set of laws and concepts that is uniquely a product of human society. Animals cannot be subject to those laws and concepts and therefore do not have the rights of humans. It is agreed,

Photo by Bill Heatherly Missouri Dept. of Conservation

Adaptable and always ready to take advantage of any food sources, raccoons can reach extra-ordinarily high population levels in developed areas, increasing public health problems, property damage and predation on other wildlife species.

Photo by Guy Connolly USDA/APHIS

Coyotes frequently prey on livestock and house pets throughout North America. Regulated trapping helps to minimize this depredation by removing individual problem animals, and the animals are utilized as valuable natural resources rather than destroyed as useless pests.

nonetheless, that animal welfare is a realistic and desirable concept which we support. Humanity does have responsibilities to animals: ensure ecological integrity, preserve genetic diversity and sustain species and ecosystems. All animals use other animals for their existence. The responsible human use of animals is natural and appropriate."

Professional wildlife biologists have concerns about the implications of the Animal Rights philosophy. Human use of, and dependence on, renewable natural resources, including animals, may foster stewardship over those resources. Millions of acres of wildlife habitat have been acquired, protected and managed for wildlife by public and private natural resource management agencies. Much of this has been made possible through funds generated by licensed hunters, trappers and anglers who collectively have a stake in the perpetuation of wildlife resources. Under the Animal Rights agenda, there would be no wildlife management, and subsequently, many species of wildlife would decline or become extirpated without the protection afforded by management. Other species would explode into burgeoning populations, escalating human-wildlife conflicts.

As our society becomes more urban, we become removed from natural systems and the processes that function within them. Our understanding and appreciation of those natural processes diminishes. We no longer have to harvest our own food, and as a result, we do not see the death involved in processing meat. We do not notice the loss of habitat, pesticide use or lethal control of animals required to produce crops and livestock. We do not witness the destruction of habitat required to extract nonrenewable natural resources that are the basis for most of the synthetic materials we use.

Rural components of our society recognize the high turnover in many wild animal populations that have naturally high death rates. The death of an individual animal is not shocking when one realizes that it is a normal, natural, and regularly occurring event, and that species have adapted reproductive strategies to compensate for these natural losses. These reproductive strategies evolved over millennia under a suite of mortality factors, including human predation. When a human uses a wild animal, the death is therefore natural, and an interest in the preservation of the wild animal population is often fostered.

We should all be aware that our lifestyles — regardless of where we live, our economic status, or our degree of "environmental correctness" — are closely and inexorably linked to animals. Animals have always provided the material and spiritual sustenance that maintains us as individuals and societies. Our need and use of them for food, clothing, art, medicine and companionship are eternal, our dependence on them complete. We must continue to support conservation efforts that ensure sustainable use.

Calamity by Design: The Prohibition of Regulated Trapping

Chelmsford, Massachusetts is located about 20 miles northwest of the city of Boston and encompasses approximately 23 square miles. The first European settlement in the area was a fur trading post, established due to the abundance of beaver in the local wetlands. Today there are still approximately 870 acres of wetlands within the town, but it is now a densely settled suburban community with over 31,000 residents (1,357 per square mile). Local government is conducted through open town meetings and administered by five elected selectmen.

During the late 1980s, a national animal rights group developed a "model" for getting trapping ban initiatives passed by town, county and state governments. The model guidelines encouraged animal rights activists to disguise regulated trapping as a public safety/animal welfare issue. Exactly in accordance with such direction, an article to ban trapping was introduced at a Chelmsford town meeting in 1988.

State wildlife experts reminded residents that regulated trapping was not a public safety issue, and warned that if regulated trapping were banned, there would be numerous undesirable consequences in the form of property damage and wildlife habitat degradation. Despite the warnings, the article was passed, and the trapping of fur-bearing mammals within the town was prohibited.

Prior to passage of the trapping ban, there were usually one to three complaints of beaver damage in the town each year. Following the ban, the beaver population, unchecked, began to grow rapidly, and the animals began to move into many previously unoccupied wetlands. Beaver dams began to flood houses and roadways. In 1992, state wildlife biologists working at the request of town officials investigated 25 beaver complaint sites. Two of these complaint sites were municipal wells which had been shut down (at a cost of $25,000) because of beaver flooding, and four other municipal wells were threatened. Individual landowners in town had incurred tens of thousands of dollars in damages to private wells, septic systems, lawns and roadways. The increasing beaver population and increasing property damage were directly related to the decision of the town's citizens to ban regulated trapping and allow uncontrolled beaver population growth to commence.

State wildlife officials offered the town several recommendations: (1) use water flow devices to reduce flooding in some areas, (2) get permits to breach beaver dams in other locations, and (3) rescind the trapping ban bylaw to allow beaver populations to be brought under control. The town took positive steps to implement these recommendations. The state issued permits to breach beaver dams that were disabling wells and septic systems. State wildlife personnel installed water flow devices (beaver pipes) at two sites and assisted town water department personnel with a third pipe. At a special town meeting in September, 1992, town citizens voted by a two-to-one margin to allow regulated public trapping to resume. During the regular trapping season later that fall and winter, four fur harvesters working with homeowners and town officials removed 87 beaver. Today, with public, regulated trapping restored, Chelmsford again has only one to three beaver complaints per year. These are handled as they had been prior to 1988, under an effective and responsible program incorporating state wildlife officials and local licensed trappers.

In Massachusetts, the state wildlife agency has a well developed management plan for beaver. The goals of this plan are to manage beaver resources as assets, not liabilities; perpetuate beaver populations for future generations; keep the beaver population at levels compatible with suitable habitat; minimize property damage caused by beaver; manage beaver for their positive wetland values, and allow people the sustainable use of public resources.

Chelmsford residents were confounded by animal rights activists who had promised in 1988 and again in 1992 to install water flow devices and proposed to "sterilize" beaver in the town (a technique that is not feasible on a free-roaming beaver population - see *Contraception* page 30). Over the four years of the trapping ban, the activists never acted on their promises and were never held accountable for the statements they put forth.

Photo by Bill Byrne

Typical beaver damage

The case study on the previous page was written several years ago. In November, 1996, the state of Massachusetts passed a ballot initiative that severely restricts trapping. As a result, complaints about property damage and health concerns related to beaver activity have dramatically increased. A biologist from the Massachusetts Division of Fisheries and Wildlife has provided the following update:

Epilogue - A State Ballot Referendum

Subsequent to the town of Chelmsford reinstating regulated trapping as a management tool to control the beaver population, a coalition of several animal rights organizations gathered the signatures required to place a statewide anti-trapping referendum before the voters on November 5, 1996. They spent $1.2 million on an ad campaign featuring graphic images which were a misleading representation of regulated trapping in Massachusetts. The campaign further implied that traps in common use in Massachusetts had teeth and were a threat to pets and children, despite the fact that toothed traps had not been legal to use for many years, only softcatch (padded jaw) traps were allowed for use on land, and no case of an adult or child being caught or injured in a legally set trap had ever been recorded in Massachusetts.

The referendum was passed, with the result that restrictions similar to those in the original Chelmsford anti-trapping bylaw went into effect statewide. The new law dramatically changed the types of traps that the public could lawfully use to control beaver populations statewide.

The net effect of the new law maximizes the number of beavers found in Massachusetts. A maximized beaver population significantly increases property damage, threatens public health and safety in regards to drinking water supplies and road stability, and increases other beaver related problems incurred by citizens.

In short, the same conditions that were evident in Chelmsford during its trapping ban have now been expanded throughout the state. The statewide beaver population has grown significantly from an estimated 24,000 in 1996 to more than 52,000 in 1999. Citizen complaints related to beaver activity continue to increase from an average of 310 per year (1991-96) to 615 per year since the law came into effect. Beaver populations can no longer be maintained at reduced levels.

The state's beaver management program has historically been proactive – maintaining the beaver population at levels compatible with suitable wetland habitat and human needs. The new law constitutes a major change in the way beavers are managed, however, eliminating proactive, regulated management, and yielding an uncontrolled expansion of the beaver population. Like the previous Chelmsford bylaw, it only allows citizens to take reactive measures to beaver causing property damage. Instead of viewing beaver as valuable wildlife, more and more people are viewing beaver as a pest to be eliminated.

Trapping and trapping devices have been a legislative issue ever since the referendum passed. Due to the increase in the beaver population and the related increase in health and safety concerns and property damage, several bills have been introduced into the state legislature to repeal or significantly change the existing statewide law. On July 21, 2000 an amended version of the trapping law was passed. It directs local boards of health to issue permits for the use of body-gripping, cage and box traps if beavers are causing problems deemed to be a threat to the public. In addition, legislation has appropriated funds to address some of the property damage caused by increasing beaver populations. The appropriation of monies was not needed in the past when proactive management programs employed regulated trapping to control beaver populations and address property damage problems. The amended law maintains the current ban on trapping for animal population control purposes.

A Final Word

Professional wildlife management has successfully restored, preserved and ensured the continuing viability of wild furbearer populations in North America. The harvest and utilization of some individuals within those populations by the public does not threaten the continuing survival of those populations. **In fact, the harvest and use of some individuals has contributed most of the funding to study and manage those populations, including protecting the habitats and ecosystems critical for their survival.**

Without regulated trapping, wildlife managers could not adequately or economically monitor furbearer populations; they could not undertake the restoration programs that have restored so many species to areas where they have not prospered for centuries; they would have fewer options to offer the public significant relief from agricultural and property damage, or to protect human health and safety; and they could not ensure the continued public use of furbearer resources.

Furbearer management is a complex scientific subject. The Wildlife Society — an international nonprofit scientific and educational organization serving professionals in all areas of wildlife ecology, conservation, and management — has published a policy on traps, trapping, and furbearer management that best represents the views of wildlife biologists.

Photo by Bill Byrne

The Wildlife Society Position on Traps and Trapping

Internationally accepted principles of natural resources conservation stipulate that resource management activities must maintain essential ecological processes, preserve genetic diversity, and ensure the existence of species and ecosystems. Regulated trapping in North America is consistent with all three criteria and is a versatile, safe, effective, and ecologically sound method of harvesting and managing species of furbearers.

Trapping provides income, recreation, and an outdoor lifestyle for many citizens through use of a renewable natural resource. It is a part of the North American heritage. It is often vital to the subsistence or self sufficiency of peoples in remote regions who have few other economic alternatives. Trapping is a primary tool of most animal damage control programs and an important technique in wildlife research. In some situations, trapping is important in management or is effective in reducing or suppressing wildlife diseases.

Despite the values of trapping, portions of the public oppose it, or at least perceive problems with some aspects of it. Some object only to certain trapping methods, particularly the foothold trap on land, but others have moral objections to killing animals. Much of the opposition to trapping is associated with urban-oriented cultures, particularly those dominated by tertiary (service-oriented) employment. Those who approve of, practice, or benefit from trapping are primarily from rural cultures or are from areas where primary (land-based) employment predominates. This dichotomy of lifestyles and values, combined with a general lack of objective information about trapping, creates barriers to understanding and resolving the controversial issues associated with trapping.

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Final Position Statement

Traps, Trapping, and Furbearer Management

Internationally accepted principles of natural resources conservation stipulate that resource management activities must maintain essential ecological processes, preserve genetic diversity, and ensure continued existence of species and ecosystems. Government-regulated trapping in North America is consistent with all three criteria and is a versatile, safe, effective, and ecologically sound method of harvesting and managing furbearers.

Trapping is part of our cultural heritage that provides income, recreation, and an outdoor lifestyle for many citizens through use of a renewable natural resource. Both trapping and hunting provide opportunities for fostering stewardship values and connecting to the out-of-doors. Trapping is often vital to the subsistence or self-sufficiency of peoples in remote regions who have few other economic alternatives. It is also a primary tool of most wildlife damage management programs and an important technique in wildlife research. Regulated trapping is an important way for biologists to collect information about wildlife, including information about wildlife diseases such as rabies that can also affect people. Threatened and endangered species also benefit from regulated trapping. For example, foxes, coyotes, and nutria are trapped in certain locations in order to protect sea turtles, black-footed ferrets, whooping cranes and other rare species from predation or damage to their habitats.

Despite the values of trapping, portions of the public oppose it, or at least perceive problems with some aspects of it. Some object only to certain trapping methods, particularly foothold traps on land, but others have moral objections to killing animals. Much opposition to trapping is associated with urban-oriented cultures, particularly those dominated by tertiary (service-oriented) employment. Those who approve of, practice, or benefit from trapping are primarily from rural cultures or areas where primary (land-based) employment predominates. This dichotomy of lifestyles and values, combined with a general lack of objective information about trapping, creates barriers to understanding and resolving controversial issues associated with trapping.

The policy of The Wildlife Society in regard to trapping is to:

1. Support the use of regulated trapping for sustained harvest of some species of furbearers as an effective method of managing or studying furbearers.

2. Recognize the economic and recreational benefits of trapping.

3. Recognize that regulated trapping is an important component of the lifestyle of many people, including subsistence users and others, who desire to live close to the land, derive as much of their sustenance from the land as possible, and take personal responsibility for their uses of animals.

4. Recognize that regulated trapping is a safe, efficient, and practical means of capturing individual animals without impairing the survival of furbearer populations or damaging the environment.

5. Recognize that animals can be injured by some traps and trapping systems and that ethical trapping requires using traps that kill animals quickly or capture and restrain animals in systems that reduce or eliminate injuries. This can be accomplished through: (a) regulatory and educational programs, (b) research that evaluates and improves trap performance, and (c) implementing acceptable and effective improvements in trapping technology, further reducing injury to captured animals while maintaining acceptable trapping efficiency and safety to users.

6. Promote development of improved traps, trapping systems, and additional methods of taking furbearing animals. Support the development of Best Management Practices (BMPs) for trapping in the United States, under the auspices of the Association of Fish and Wildlife Agencies, and encourage state wildlife agencies to promote the use of BMPs in state furbearer management and trapper outreach programs. Support the sustainable use of furbearer resources in carefully regulated management programs.

7. Promote trapper education programs that cover appropriate trapping techniques, proper fur handling, and furbearer management.

8. Recognize that significant opposition to trapping exists, in North America and abroad. Advocate research on furbearers, trappers, trapping methods, and attitudes of publics toward trapping to advance understanding and facilitate resolution of controversial issues and problems associated with furbearer management.

9. Promote programs that inform the public, including trappers, about values and benefits of properly regulated, sustained use of renewable natural resources, including furbearers.

10. Encourage appropriate government regulation of trapping and rigorous enforcement of trapping laws by responsible agencies to assure that optimum furbearer populations are perpetuated and that trapping and furbearer management programs are compatible with or enhance the management of other species, including threatened and endangered wildlife.

11. Encourage international efforts, especially beyond North America, to improve the conservation and management of furbearer species, including the use and adoption of BMPs for capturing wildlife, and the training of trappers and professional biologists on state of the art developments in furbearer management.

Approved by Council March 2010. Expires March 2015.

Montana Fish, Wildlife & Parks

Wildlife Management and Regulated Trapping in Montana

Montana Fish, Wildlife & Parks (FWP) Information Sheet

Trapping has a time-honored heritage in Montana.

For centuries, people have trapped furbearers across Montana. Presently, Montana sportsmen and sportswomen take part in this fur trapping heritage to legitimately harvest a renewable resource on public and private land.

State law requires FWP to be responsible for the conservation of fish and wildlife populations.

- FWP has the responsibility to conserve, protect, and manage wildlife species, including animals that are hunted and trapped, for the long-term viability of their populations, while providing for responsible public use. In following these guidelines and state law, FWP manages the state's furbearing animals, and licenses and supports trapping (similar to fishing and hunting) as an important cultural, recreational, and wildlife management activity.
- Like other animals that are hunted, furbearers are trapped to provide public use and managed for sustainable populations that are in balance with habitat conditions. ***Regulated trapping does not endanger wildlife populations.***

Furbearer trapping is regulated by state laws and FWP Commission rules in Montana.

- Similar to hunting or fishing, FWP requires trappers to purchase a Montana trapping license and comply with trapping regulations that apply on both public and private land.
- The FWP Commission approves trapping regulations every two years through a public process and adopts harvest quotas for certain furbearers annually. These regulations are scientifically based and are strictly enforced. Land trapping seasons are restricted to less than three months of the year.
- Trapping regulations cover 10 legally classified species, several predators, and some nongame animals with fur. FWP has management authority for animals that have been classified by the Montana Legislature as furbearers, with an open season adopted by the FWP Commission. These species are beaver, otter, muskrat, mink, marten, fisher, wolverine, bobcat, and swift fox, which have restricted trapping seasons and fall directly under FWP furbearer regulations.
- Other animals with fur value that are trapped include coyotes, weasels, and skunks that are classified as predators, and nongame animals such as raccoon, red fox, and badger. Certain general trapping regulations apply when trapping for these animals.

Trappers provide FWP with information that assists with wildlife management.

- For some furbearer species, such as bobcats, trappers are required to present all harvested animals to FWP for the collection of information that includes harvest

location, sex, age, and other biological samples. Furbearer trapper reports and annual trapper surveys for all species are used to help monitor species distribution and trends in population productivity.

Scientists and wildlife managers across the country support regulated trapping.

- The Wildlife Society, the professional organization of wildlife biologists, managers, and university staff in North America, promotes the position that regulated trapping is a biologically sustainable, safe, effective, and ecologically sound method of managing furbearers. The Wildlife Society recognizes that "trapping is part of our cultural heritage and provides income, recreation, and an outdoor lifestyle for many citizens through use of a renewable natural resource." This organization also stresses that trapping is important in animal damage control, wildlife research, and in suppressing some wildlife diseases. The Society recognized trapping as one of the vital components of the North American Model of Wildlife Conservation in a special issue of the *Wildlife Professional* in 2010.

Trapping is biologically sustainable.

- Trapping is managed by FWP as a recreational activity, cultural heritage, and management tool for a renewable furbearer resource. Fur trapping is sustainable because levels of furbearers taken are a small percentage of the total population size and reproduction replaces harvested animals each year. Seasons are scheduled so that furbearer offspring are independent of the adult by the time trapping seasons begin.
- As an example of sustainability, trappers meet the statewide quota of approximately 2,000 bobcats taken year after year. Bobcat populations are healthy in terms of distribution, numbers, age, and sex ratio. This is a classic example of a biologically sustainable wildlife management program.

Trapping is similar to hunting in requiring strong ethics in its pursuit.

- Regulated fur trapping is the only way to effectively harvest most furbearers. Many of these species are active only at night and could not be ethically hunted. A foothold trap is designed to hold the animal by its foot; the animal can then be released or quickly killed. A conibear (body gripping) trap is designed to result in a quick and humane kill of the animal when captured.
- As an example of the relationship between trapping and hunting, bobcats can be hunted with hounds as well as trapped, so any trapping regulations applied to this species affect hunting opportunity as well. Best Management Practices for trapping are being incorporated into Montana's trapper education program.

Trapping takes place across the Montana landscape and provides multiple benefits.

- Like hunting, trapping takes place on public and private lands across Montana. Trappers harvest furbearers, predators, and several nongame wildlife species to assist in population management, to protect livestock and prevent damage to agricultural lands, to receive economic value from pelts, and to pursue a legal outdoor recreational activity.
- Controlling some species of furbearing animals reduces wildlife damage conflicts on private lands and on public lands along roadways and streams. For example, beaver populations in many areas of Montana are at high enough levels that landowners are struggling to find people to trap and remove them. In many areas of northwest Montana, beavers are constructing extensive dams and ponds and blocking access of federally threatened bull trout to spawning streams. Beaver are also a perennial problem in many areas where they block road culverts and cut down trees along waterways, contributing to stream channel instability and local flooding.
- Trappers are required to label all traps with their license information on both public and private lands, regardless of what species they are trapping. Furbearer trappers must have permission to trap on private land and must follow additional restrictions on public land.
- From an FWP wildlife management perspective, the term "public lands" is considered to be all federal and state lands. These include U.S. Forest Service, Bureau of Land Management, Bureau of Reclamation, and U.S. Fish & Wildlife Service federal lands. State lands are primarily FWP Wildlife Management Areas and Department of Natural Resources & Conservation School Trust lands.

Trapping is an annual component of Montana's economy and provides many value-added opportunities.

- Approximately 4,000 Montanans buy trapping licenses each year, and the number has increased in the past two decades. In terms of user-days, a standard way of calculating economic benefit for fishing or hunting, fur trapping is worth more than $1 million dollars to Montana's economy each year. Furbearer pelts are used in garments, decorations, taxidermy, and even for spiritual or religious items. Furbuyers and businesses that trade in fur or make garments are based in Montana. In addition, many trappers sell pelts through national and international auctions. Income to Montanans from pelt sales in 2007-08 amounted to an estimated $2,125,775 based on the number of reported furbearers taken.

Furbearer trappers must follow existing regulations to trap on public and private lands.

- On public lands, trapping regulations govern the distance furbearer traps must be placed away from trailheads, campgrounds, and other public use areas. As long as licensed furbearer trappers abide by these and other trap-type restrictions, they are allowed to trap on public and private land.
- Some local trapping closure areas exist. For example, furbearer trapping closures have been adopted by the FWP Commission that encompass about 40,000 acres in several high-use winter recreation areas around Missoula.
- FWP wildlife management areas have special regulations in place restricting the number of trappers and limiting trapping to specific time periods.
- Trapping on state school trust land involves a permitting process and special regulations.

FWP has taken actions to minimize incidental captures when setting trapping regulations.

- Montana has one of the most effective sets of regulations for avoiding nontarget wildlife and domestic pet capture in the nation. Furbearer regulations, including types of traps that can be used and where they can be placed, exist to help prevent accidental captures of domestic pets and nontarget wildlife species.
- In the 2008-09 and 2009-10 trapping seasons, FWP documented four reports (three on public land, one on private land) of dog mortalities in traps across the entire state. Three of the dogs were "at large" (roaming without their owners nearby) and another was roughly one mile away from its owner. Responsibility also rests with the dog owner to not allow the pet to range out of the owner's control or to run at large. There is no record of a hiker or other recreationist ever being caught in a trap.
- FWP provides informational materials to trappers to help avoid or minimize the accidental capture of nontarget animals. FWP also has educational information available for dog owners and other recreationists that provides an overview of trapping in Montana, what to expect when a trap is encountered, and how to respond if a pet is accidentally captured.

Regulations encourage trappers to regularly check traps.

- FWP recommends that trappers check their traps at least once every 48 hours. State law requires that trappers must attend traps in a manner that does not waste furbearing animals and that traps must be removed when the furbearer trapping season is completed.

FWP strongly recommends Trapper Education programs which are offered in Montana.

- Voluntary trapper safety and education courses are offered each year around the state and are coordinated by volunteer instructors with regular participation by FWP staff. FWP strongly encourages all trappers to participate in the Trapper Education Program and supports the effort to make trapper education mandatory for all first-time trappers.
- Trapper safety and education is also provided during the annual summer Youth Trapper Camp that is a cooperative effort between the Montana Trapper's Association, FWP, and Montana 4-H.

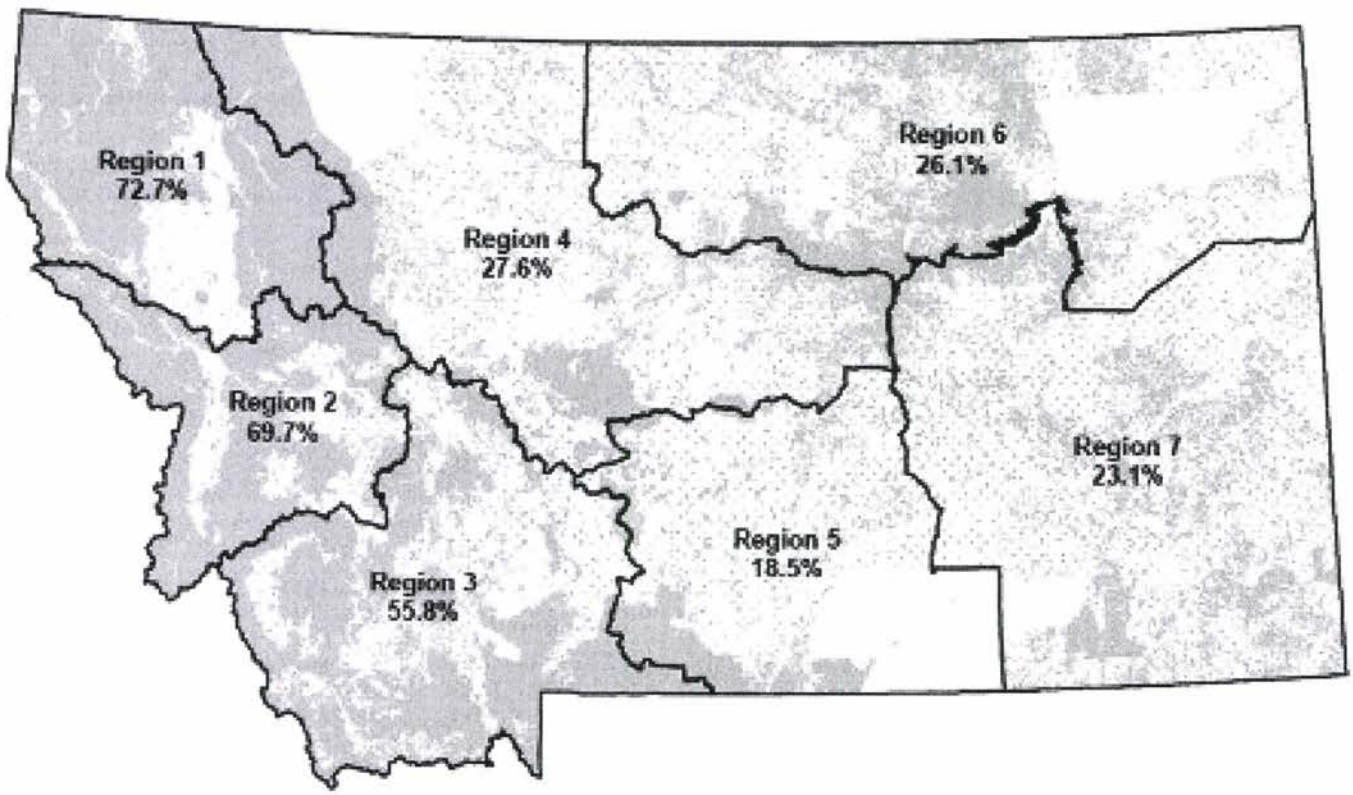
Distribution of public and private lands in Montana

- Landownership patterns vary significantly across the state when shown as the percent of public land by FWP administrative region displayed in Figure 1. While these percentages are weighted more heavily to public ownership in western Montana, the map does depict mixed ownership patterns occurring across the eastern two-thirds of the state. This ownership pattern and the distribution of wildlife species across both public and private lands have direct implications to effective wildlife management and associated opportunities.

Figure 1. Landownership Patterns across Montana

Wildlife species do not recognize administrative boundaries, so it is essential that Montana Fish, Wildlife & Parks manages furbearers across lands of all ownership.

Shaded areas represent public lands (and percentage) by FWP region.



▶ Visit FWP's Web site at fwp.mt.gov for more management and trapping information. Click "Hunting," and then select "Trapping."

FURBEARER PROGRAM

STATEWIDE HARVEST & MANAGEMENT REPORT 2013-2014

MONTANA

Montana Fish, Wildlife & Parks

WILDLIFE RESTORATION

FURBEARER PROGRAM

2013-14 STATEWIDE

HARVEST AND MANAGEMENT REPORT

PERIOD COVERED: July 2013 – June 2014

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Program Goals

1) Maintain well-distributed and healthy furbearer populations and associated habitats.

2) Provide ecological, recreational, cultural, educational, economic, and scientific benefits of the state's furbearers though sound resource management.

3) Address the social impacts of furbearers on human health, private property, and agricultural values.

Statewide Objectives

1) Monitor population trends and the distribution of each furbearer species.

2) Maintain Montana's viable populations of each species by promoting the conservation and enhancement of furbearer habitats.

3) Address the interest by resident publics for consumptive and non-consumptive uses of the state's furbearer resource.

4) Optimize recreational harvest opportunities through a sustained use management approach under regulatory protections.

5) Minimize animal damage and/or nuisance wildlife problems utilizing Department policies and management practices.

6) Promote trapping practices that minimize the take of non-target species and maximizes the humane harvest of furbearers.

7) Develop a public understanding and acceptance for the basis of the consumptive use of furbearers.

Management Strategies

1) Identify and associate species distribution and population trends with delineated habitats.

2) Investigate species population trends through species/habitat surveys, species occurrence reports, harvest data, and research information.

3) Utilize regulatory mechanisms to provide trapper/hunter participation, harvest data, and biological information.

4) Include furbearer species in land management decisions.

Harvest and Management Activities

1) Population information and harvest data are collected by county and/or trapping district and reported by trapping district and statewide in this report. This method is intended to more closely describe the association between species diversity, distribution, and abundance with identified ecosystems and to use reconcilable legal units in the state. Furbearer species with harvest seasons are beaver, otter, muskrat, mink, marten, fisher, wolverine, bobcat, and swift fox. Furbearers with a closed season are lynx, and are not included in this report. Weasel, skunk and coyote are state classified predators while red fox, raccoon, and badger are nongame species of which limited harvest data is collected so they are included in this report.

2) The annual harvests of otter, marten, fisher, wolverine, bobcat and swift fox are monitored through a statewide reporting, pelt tagging and harvest registration system. Registration is initiated under 24-hour mandatory reporting through an automated telephone call-in system referred to as the Mandatory Reporting Response Entry (MRRE) system. All pelt tag sealing and completion of species harvest registration forms, which are generated in MRRE, are conducted by FWP personnel. Marten, fisher, wolverine and swift fox pelts are tagged under the authority of the state, while otter and bobcat are tagged under oversight of the U.S. Fish & Wildlife Service to meet federal CITES pelt export requirements.

3) Harvest data on the three remaining furbearers (beaver, muskrat, mink) and six fur-producing animals (weasel, skunk, coyote, fox, raccoon, badger) was collected through a mailed trapper harvest survey questionnaire. In addition, the same harvest data is collected on the five tagged/registered furbearers through the same survey questionnaire to specifically measure trapper effort and catch rates. Trapper effort will be used in developing long-term species population trend indices. The trapping and fur harvest survey was mailed to all resident and nonresident trapping license holders. This year a reminder was sent to non-respondents. Expanded estimates of furbearer trapping, hunting, and harvest activities were made from the returned sample. The survey requests information on the estimated number of species harvested by county and trapping district, harvest method, and harvest effort. Summary harvest statistics and calculated catch rates were generated by a software package through FWP's Research & Technical Services Unit.

4) Mandatory carcass collections are required for fisher and wolverine, and skulls must be surrendered from harvested otter, bobcat and swift fox. Marten skulls have not been required to be turned in since the 2008-09 season, but were collected in prior years. All carcasses and skulls are forwarded to FWP's Wildlife Laboratory in Bozeman for biological analysis to determine specimen age, sex, body condition, food habits, reproductive history, and to collect tissue samples for potential genetic analysis.

5) A Montana fur dealer survey conducted by the state furbearer coordinator has been replaced by checking the North American Fur Auction (NAFA) website after the winter and spring sales in order to obtain average pelt values for each fur-producing species. An increasing number of Montana trappers are shipping directly to NAFA. This information can be used to calculate economic fur value of each species as a predictor of harvest pressure (i.e. higher prices = greater harvest pressure).

6) Annual winter furbearer snow track surveys had been conducted by regional wildlife biologists following a standardized survey protocol and track identification methods in Trapping Districts 1-4 (NW and SW mountainous forest habitats). However, track surveys were discontinued after the 2011-12 winter until a further monitoring evaluation is conducted.

7) Biologists in trapping districts 4-7 are in the process of developing lagomorph prey indices through the use of headlight surveys. The numbers of lagomorphs are counted on established routes three times each survey period. This index to prey availability is utilized to predict bobcat population fluctuations by anticipating changes in annual rabbit production (March surveys) or recruitment levels (September surveys).

8) Department furbearer occurrence/distribution report forms are distributed and collected annually. Reports are completed only by Department personnel from verified reports or personal observations. Accumulated reports provide species occurrence and location data to assist in delineating statewide and trapping district distribution of selected furbearer species (primarily otter, fisher, wolverine, lynx and swift fox).

9) Furbearer research is an ongoing statewide activity that is utilized to address management related issues on a species-specific basis when funding is available.

Statewide Harvest and Management Results

Harvest and management results were analyzed by county and trapping district and reported as a statewide summary. The seven legally defined trapping districts (TDs) and 56 Montana counties are shown in Fig. 1.

License Sales

The 5,957 trapping licenses sold during the 2013-14 season was a 6% decrease from the previous year of 6,299 licenses and about 30% above the 10-year average (Fig. 2). License purchases in the seven regions and at the Helena headquarters are somewhat mixed each year. However, in 2013-14 three regions and Helena had decreased sales from the previous year (Table 1). High furbearer pelt prices, the ability to purchase licenses online, and continued interest in the second gray wolf trapping season with the requirement that wolf trapper's purchase a general trapper license have all contributed to higher sales. Again, this general trend in statewide license sales is apparently continuing through 2013-14 from the lowest license numbers at any time in 1990-91 when 1,736 licenses were sold.

Annual Harvest Summary

Montana's furbearer harvest for the 2013-14 season is presented in Table 2. A 10-year harvest summary for years that species harvest data is available is presented in Table 3. These figures represent the known legal harvest of registered furbearer species and an estimated harvest of the remaining six species based on the trapper harvest survey. Detailed harvest statistic estimates by species, trapping district and county are available in the Trapping and Fur Harvest Reports (K. Podruzny, pers. comm.). During the most recent year, trapper survey questionnaires were returned from approximately 43% of the 5,546 sampled trapper's license holders during the 2013-

14 furbearer season. The total number of animals reported being taken during the 2013-14 season decreased by 27% over the 2012-13 season (Table 3). This decrease may be the result of weather conditions in portions of the state, generally stable populations of most furbearing animal species in areas of the state, and a decline in average pelt prices for some species.

Pelt Prices

Pelt prices generally were stable to declining among the various species during the 2013-14 season, with several species demonstrating decreases in value, particularly beaver, otter, and bobcat, although bobcat prices still remain high (Table 4). Average pelt prices remained very strong in 2013-14 for muskrat and coyote with record or near record high pelt prices for mink and marten, similar to the previous year.

Species Harvest Summary

Statewide species harvest trends by trapping districts and statewide are presented in the Species Harvest Summary section (pages 17 to 54). The statewide harvest of most species was generally stable to decreasing with larger decreases in the beaver and coyote harvests during 2013-14. These changes are variable, however, among the seven trapping districts. Harvest numbers may correspond to species abundance within each habitat type, although other variables, such as trapper effort and daily catch rate, may be more useful indicators to correlate harvest data with population trends. Under this assumption, there are specific implications for habitat and species harvest management opportunities.

Population Monitoring

Results calculated from the trapper harvest survey that reports trapper effort for all species, including the known registered species harvest, provided Catch Per Unit Effort (CPUE = 1 divided by the # of animals harvested x 1,000 trap days) which is used to help monitor population trends (Species Harvest Summary pages 17 to 54). Using estimated catch rates (trap days/catch) from the annual harvest survey continues to be evaluated as a population monitoring parameter. Metrics such as these will be examined further to determine how well they may reflect species population trend. Graphs of the CPUE for species groups, to compare trends among similar species, are presented on pages 53 and 54 in the Species Harvest Summary section.

Results of carcass collections from fisher and wolverine, and skull turn-in from otter and bobcat are shown under each of these species sections in the Species Harvest Summary (pages 17 to 54). The most important aspect of these collections is to extract a tooth for age determination. The graphs illustrate analysis of the biological parameters reported, which are juvenile/adult female ratios, age structure, sex ratios, and median ages of the harvest sample which should represent population parameters. Not all years or the most recent year, including 2013-14, are available for age data during this report period, as processing adult teeth can take 1-2 years for results. Marten skull collections were discontinued beginning with the 2008-09 season, partially because population parameters have remained relatively stable. Fisher and wolverine sample sizes are extremely small, so they do not necessarily represent any population trend. Additional species information from FWP wildlife laboratory analysis will be reported as it becomes available in future reports.

The number of FWP occurrence/distribution reports received showed a consistent trend during the past several years with the majority of reports collected for wolverine and swift fox. Recent reports will to be entered in a locational referenced database, similar to the furbearer harvest database that provides species distribution data. The number of counties in the state for reported swift fox observations continues to increase.

Furbearer Research

Research related to furbearers that were permitted and/or financially supported by FWP or the state furbearer program during the report period includes an ongoing lynx project in northwestern Montana and an otter genetics population connectivity investigation that was initiated during the last report period. The USFS lynx project is continuing, focusing on adult female reproduction and kitten survival. No results are yet available from the otter genetics analysis. Wolverine work conducted from 2002-2010 has been completed and continues to be published in peer review journals (R. Inman, pers. comm.). A bibliography of most furbearer program related research and management to date is listed on pages 55 to 63 in this report.

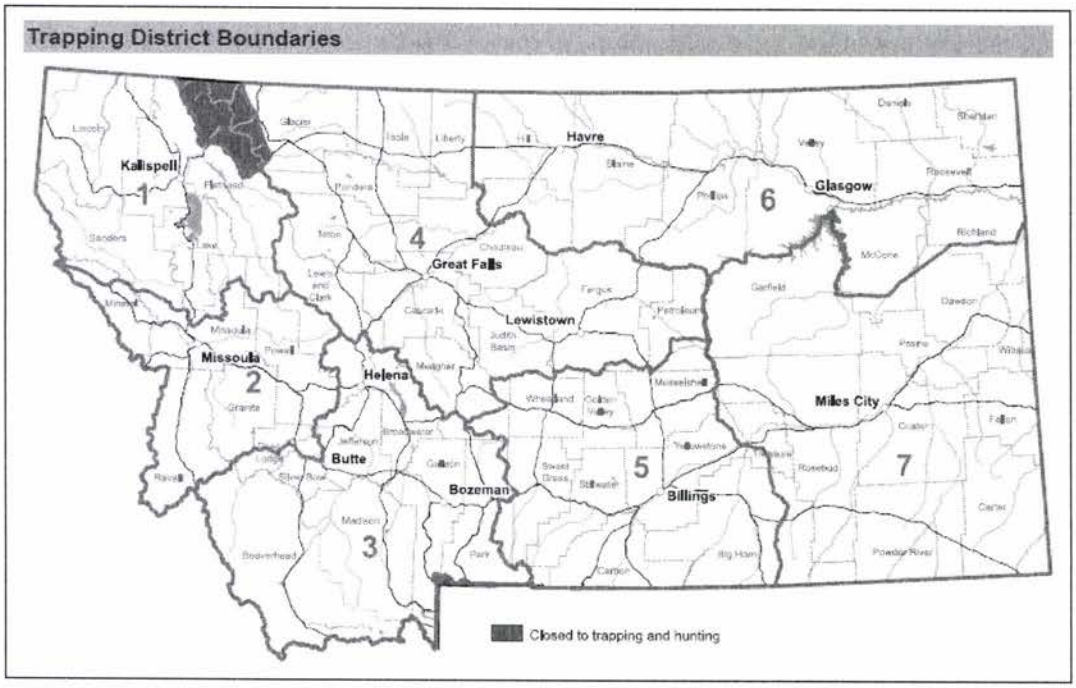

Figure 1. Map of Montana delineating furbearer regulation trapping districts and counties.

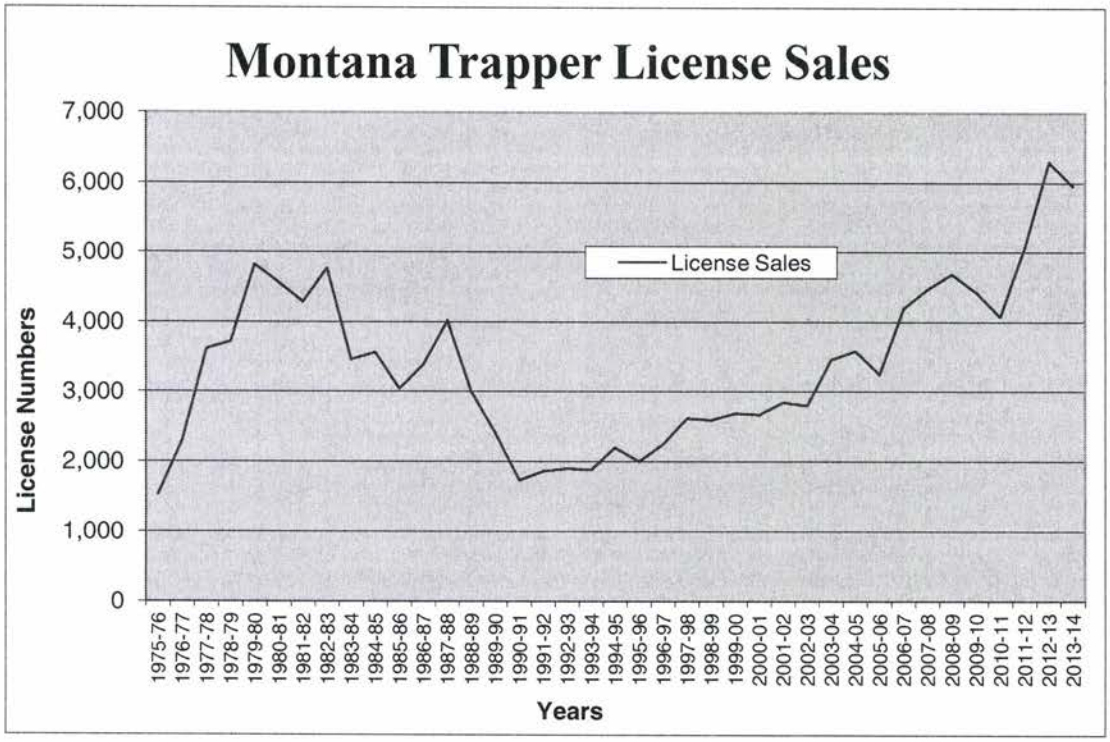

Figure 2. Montana trapper license sales trend, 1975-76 to 2013-14.

Table 1. Montana trapping license sales, 2013-14.

License Type	Kalispell	Missoula	Bozeman	Great Falls	Billings	Glasgow	Miles City	Helena	Statewide
General	859	642	1,036	615	752	209	530	1,140	5,783
Youth	10	5	11	3	7	1	5	6	48
Landowner	7	8	14	26	21	9	23	6	114
Nonresident	0	2	1	4	2	1	2	0	12
Total	876(+2%)	657(-6%)	1,062(-1%)	648(-1%)	782 (0%)	220 (+11%)	560 (+9%)	1,152(-24)	5,957(-6%)

Table 2. Montana furbearer, predator and nongame species harvest summary, 2013-14.

Trapping District	1	2	3	4	5	6	7	Total*
Beaver	445	707	1,368	1,510	591	566	247	5,435
Otter	21	20	37	7	4	0	0	89 (10)
Muskrat	2,256	4,277	6,163	1,549	670	1,011	319	16,248
Mink	70	148	448	169	36	131	22	1,024
Marten	399	709	667	4	49	--	--	1,828
Fisher	2	5	--	--	--	--	--	7 (0)
Wolverine	0	0	0	0	0	--	--	0
Bobcat	302	195	271	173	307	57	334	1,639
Swift Fox	-	-	-	-	-	7	-	7
Weasel	131	133	82	7	7	0	2	363
Skunk	152	70	128	419	465	196	123	1,554
Coyote	583	620	1,237	4,118	2,501	3,568	3,026	15,652
Red Fox	157	407	281	436	329	191	240	2,041
Raccoon	82	157	680	714	2,551	758	1,058	6,001
Badger	17	48	111	581	22	160	94	1,034
Total	4,617	7,496	11,473	9,687	7,532	6,645	5,465	52,922

*Figure may include animals harvested in unknown trapping district and ( ) indicates incidental harvest.

Table 3. Montana furbearer, predator and nongame species 10-year harvest summary, 2004-05 to 2013-14.

Year	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Beaver		8,918	7,421	7,219	7,124	5,795	5,445	6,833	7,086	5,435
Otter	88	93	78	67	60	64	58	68	88	89
Muskrat		21,270	17,014	10,042	10,699	12,754	18,494	27,236	27,731	16,248
Mink		1,306	1,348	1,018	655	584	760	872	1,491	1,024
Marten	1,248	952	856	1,141	844	711	932	1,083	1,721	1,828
Fisher	7	9	7	6	7	6	7	7	7	7
Wolverine	11	11	9	9	4	3	4	2	0	0
Bobcat	2,114	2,201	2,228	2,389	2,428	1,738	1,644	1,975	1,638	1,639
Swift Fox							7	16	21	7
Weasel		243	503	310	175	120	488	342	301	363
Skunk		2,325	1,933	2,599	1,845	2,717	3,975	1,735	1.711	1,554
Coyote		9,412	10,886	9,723	6,969	9,048	8,489	16,398	20,131	15,652
Red Fox		2,473	3,164	1,862	1,696	1,471	1,418	2,469	2,837	2,041
Raccoon		4,540	4,368	4,506	4,052	4,099	2,201	6,409	6,557	6,001
Badger		1,166	1,330	871	643	450	609	1,474	1,292	1,034
TOTAL		54,939	51,145	41,762	37,201	39,110	45,531	66,919	72,591	52,922

Table 4. Average pelt price reported by species, 1990-91 to 2013-14.

Year	Beaver	Otter	Muskrat	Mink	Marten	Fisher	Wolverine	Bobcat	Coyote	Red Fox	Raccoon	Weasel	Skunk	Badger
1990-91	9.52	25.15	0.73	13.84	25.47	35.00	140.00	90.98	13.01	8.45	4.32	0.27	4.05	5.29
1991-92	11.81	17.50	1.30	20.50	25.58	40.00	130.00	87.00	23.95	22.50	8.28	2.25	4.25	7.65
1992-93	8.02	39.76	1.18	10.21	17.24	35.00	135.00	85.37	22.18	11.17	10.68	3.50	4.52	8.38
1993-94	12.35	33.30	1.54	10.02	21.74	32.74	147.80	90.43	15.78	10.68	10.10	2.00	3.01	6.82
1994-95	14.95	30.00	1.67	9.31	15.00			81.75	20.61	15.33	9.30	2.66	3.40	11.87
1995-96	16.13	35.95	2.82	9.16	19.17		200.00	75.42	19.46	18.58	10.97	1.75	6.15	10.00
1996-97	23.59	30.98	3.83	14.48	25.01			124.05	24.68	17.74	15.26	1.83	3.86	11.19
1997-98	21.18	20.00	1.94	9.54	17.25			95.25	17.15	12.72	14.67	1.00	2.85	11.73
1998-99								85.50						
1999-00					19.33			98.67	22.06					
2000-01	15.98	59.17	1.71	8.37	19.95	28.62	212.94	106.05	18.93	16.24	10.02	1.50	3.73	15.98
2001-02	12.40	47.93	2.07	10.05	18.70	25.12	225.00	135.25	23.70	22.65	19.30	2.00	5.00	18.50
2002-03	14.00	75.00	2.10	10.50	19.50	25.00	225.00	203.00	30.70	24.00	11.00	3.00	7.00	21.50
2003-04	14.50	90.00	2.15	11.00	20.50	28.10	275.00	280.25	28.50	20.00	11.50	3.00	5.50	23.00
2004-05	15.25	94.00	2.25	11.50	19.50	28.25	275.00	325.00	30.70	21.50	11.00	3.00	7.00	23.50
2005-06	20.50	100.00	3.50	15.00	45.50	35.00	300.00	345.00	38.50	25.00	11.50	3.00	6.50	27.50
2006-07	23.49	80.00	3.20	12.88	61.57	74.31	217.85	257.33	43.36	20.84	22.05	4.96	4.04	27.57
2007-08	24.80	40.91	3.23	15.22	77.29	87.51	280.35	449.45	37.90	22.49	33.22	5.69	5.27	42.60
2008-09	25.21	30.85	2.55	11.53	37.58	42.83	254.67	281.35	30.70	21.59	17.86	4.02	2.32	24.80
2009-10	16.74	51.10	4.23	17.39	47.76	50.08	211.42	346.54	35.29	22.34	18.02	4.07	2.34	72.56
2010-11	16.57	57.63	6.66	17.48	61.98	47.58	253.15	411.84	73.16	24.37	18.50	3.13	2.11	24.12
2011-12	38.22	102.29	10.19	23.14	55.94	74.99	319.67	426.31	77.30	57.49	19.45	3.16	7.30	38.61
2012-13	30.91	112.58	11.51	20.05	84.70	145.30	235.74	589.08	93.98	65.78	27.56	3.13	4.26	25.45
2013-14	22.50	65.46	11.41	21.10	85.92	104.52	232.43	393.49	90.67	47.29	21.61	3.20	4.26	24.38

SPECIES HARVEST AND MANAGEMENT SUMMARY

BEAVER

The statewide beaver harvest has been relatively stable over the past several years, and after an increase in 2011-12 and again in 2012-13, harvest numbers in 2013-14 declined back to the pre-2011 level, and continue to remain at a lower level from the most recent peak harvests in the late 1990s (Fig.3). The estimated 2013-14 harvest of 5,435 beaver is 23% below the 10-year average annual harvest which corresponds to reported below average pelt prices (Table 5).

Examining the trend in CPUE it appears harvest effort continues to decrease during the 2012-13 and 2013-14 seasons after a slightly increasing trend in previous years, indicating that less beaver are being taken per unit of effort (Fig. 4). Population monitoring activities for beaver are based completely on reported trapper harvest survey data, with the CPUE considered to reflect a relative population trend, which could be considered as a stable to decreasing trend since 2007-08. A comparison of CPUE for beaver with the other semi-aquatic species is shown in Fig. 47.

Generally, higher pelt prices will lead to more trapper effort, as reflected in the CPUE during 2011-12 for beaver and an increase in harvest numbers, particularly in certain portions of the state, however that trend began to decline in 2012-13 and continued through 2013-14. Habitat conditions may also be influencing beaver numbers by expanding water areas and riparian tributaries as a result of more recent good spring moisture conditions, which could lead to less damage control complaints, at least in some regional areas of the state, particularly western and central Montana.

Table 5. Beaver harvest, pelt price, and quota level if applicable, 1994-95 to 2013-14.

Year	TD 1	TD 2	TD 3	TD 4	TD 5	TD 6	TD 7	State	Pelt Price	Quota
1994-95	823	1173	2795	2637	2164	1847	248	11699	14.95	
1995-96	679	846	1854	2118	2127	711	285	8620	16.13	
1996-97	626	1118	2961	5681	3453	1590	1122	16550	23.59	
1997-98	698	1194	4460	3005	2227	972	959	13515	21.18	
1998-99	510	1045	3243	3942	1900	718	276	11634		
1999-00	908	1298	2821	2966	1961	2265	587	12805		
2000-01	399	1095	2623	1756	2528	407	247	9056	15.98	
2001-02	499	1394	3242	2953	1266	1273	460	11156	12.41	
2002-03	685	1071	2296	2040	1201	777	399	8475	14.01	
2003-04	424	1485	2336	2074	2175	477	389	9361	14.51	
2004-05									15.25	
2005-06	767	628	2852	1970	856	1626	219	8918	20.51	
2006-07	479	944	2067	1450	1509	661	310	7421	23.49	
2007-08	209	812	1409	788	698	994	313	7219	24.81	
2008-09	415	513	2015	1199	618	460	107	7124	25.21	
2009-10	466	836	1021	1034	437	233	295	5795	16.74	
2010-11	315	825	963	1356	709	16	267	5445	16.57	
2011-12	357	1225	1805	1931	567	696	252	6833	38.22	
2012-13	653	1104	1931	1711	835	532	309	7085	30.91	
2013-14	445	707	1368	1510	591	566	247	5435	22.50	

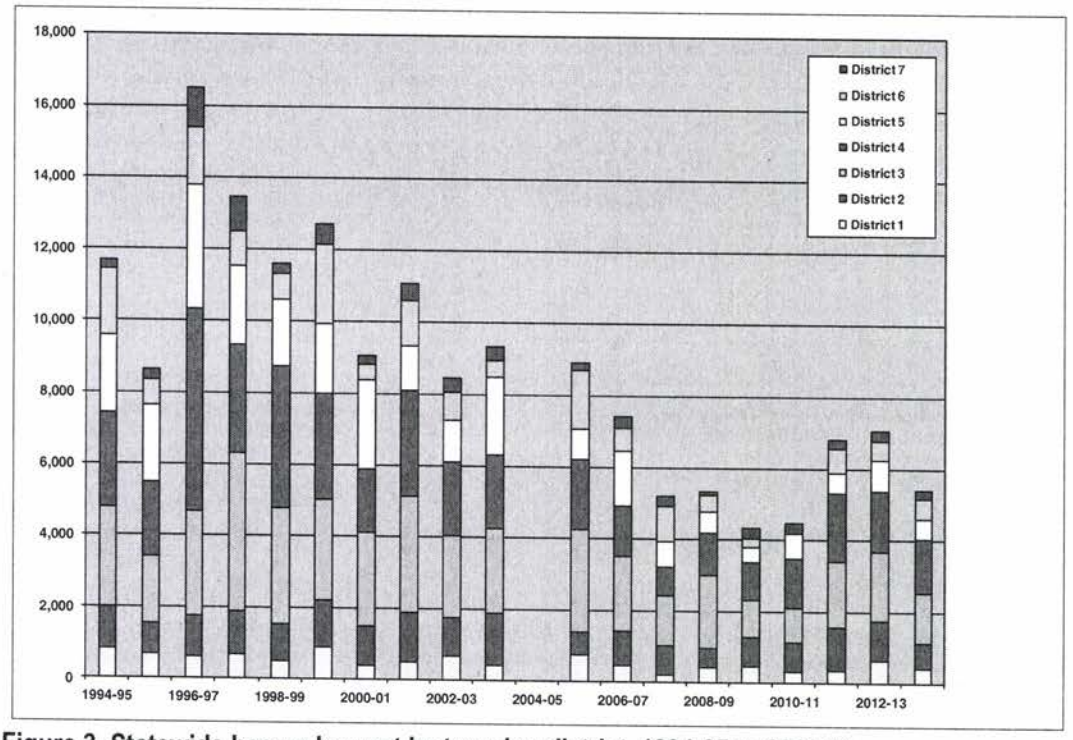

Figure 3. Statewide beaver harvest by trapping district, 1994-95 to 2013-14.

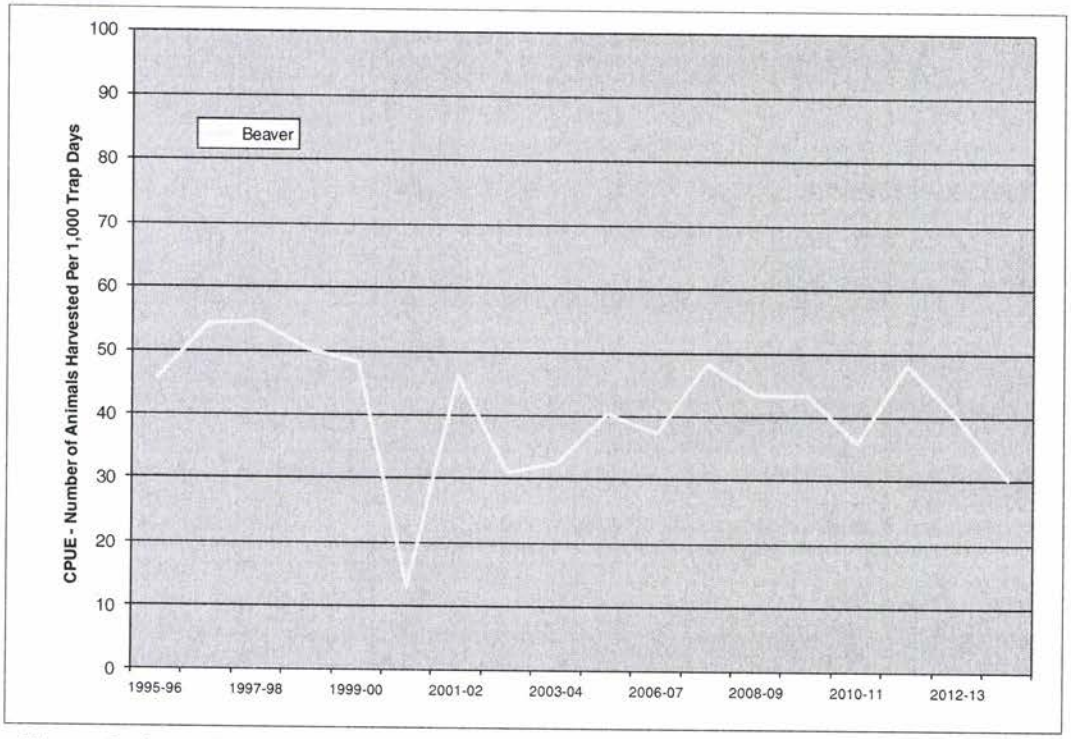

Figure 4. Statewide trend in beaver harvest from CPUE, 1995-96 to 2013-14.

OTTER

Otter are one of five furbearers that are required to be reported, registered and pelt tagged so that the actual number of harvested animals is known. The 2013-14 harvest of 89 otters is about 15% above the 10-year average of 75 otters (Table 6). The otter harvest has always been managed through a trapper limit and since the 2002-03 season, also under TD quotas. Also in 2002-03 the otter limit was increased from one to two per trapper within the TD quota structure. These changes were made in response to healthy otter populations, to reduce surrendered incidental take in beaver sets, and more interest by trappers as pelt prices were increasing at that time. Quotas are now used as a harvest management tool to maintain well distributed and healthy otter populations, while the trapper limit provides more opportunity and flexibility to harvest otter by the trapping community. The total quota for the state has increased from 84 in 2002-03 to 95 in 2007-08, at which level it has remained (Table 6). The statewide otter harvest increased with pelt prices until a peak price and corresponding harvest occurred during the 2005-06 season. Harvest then declined through the 2011-12 season, but has since increased in 2012-13 and 2013-14, probably a result of higher pelt prices prior to 3013-14. However, the long-term harvest level and proportion of the harvest by TD has remained relatively stable (Fig. 5).

The statewide trend in otter harvest CPUE has been relatively stable, however an increase occurred in 2012-13 indicating less effort per otter harvested which may suggest an increasing otter population, however during 2013-14 the CPUE declined (Fig. 6). A comparison of otter CPUE with the other semi-aquatic species is presented in Fig. 47. Population monitoring for otter consists of the collection and analysis of biological data from the harvest sample through mandatory carcass turn-in from trappers through the 2012-13 season. Starting with the 2012-13 season, only otter skulls are being collected. For the report period, however, age data is not yet available from the 2013-14 season so trends in population parameters of juveniles per adult female, age structure, sex ratios, and median ages shown in Fig. 7 to 10 are through 2012-13, but indicate a strong juvenile segment at least on a statewide basis.

Table 6. Otter harvest, pelt price, and harvest quota if applicable, 1994-95 to 2013-14.

Year	TD 1	TD 2	TD 3	TD 4	TD 5	TD 6	TD 7	State	Pelt Price	Quota
1994-95	23	7	23	4	5	0	0	62	30.01	
1995-96	17	8	22	6	7	0	1	61	35.95	
1996-97	17	8	27	7	6	0	0	65	30.98	
1997-98	15	8	41	13	7	0	0	84	20.01	
1998-99	17	4	34	9	3	0	0	67		
1999-00	18	9	26	8	3	0	0	64		
2000-01	13	15	18	1	1	0	0	48	59.17	
2001-02	28	23	39	5	1	0	0	96	47.93	
2002-03	21	13	35	8	4	0	1	83	75.01	84
2003-04	19	18	33	8	2	0	0	80	90.01	84
2004-05	25	19	32	8	3	0	1	88	94.01	92
2005-06	20	22	36	8	5	0	2	93	100.01	93
2006-07	21	17	29	6	5	0	0	78	80.01	93
2007-08	24	14	17	5	2	0	1	67	40.91	95
2008-09	21	14	22	0	3	0	0	60	30.85	95
2009-10	21	20	17	8	2	0	0	68	51.10	95
2010-11	20	14	18	4	3	0	0	59	57.63	95
2011-12	22	19	21	3	3	0	0	68	102.29	95
2012-13	26	16	32	8	3	0	0	85	112.58	95
2013-14	21	20	37	7	4	0	0	89	65.46	95

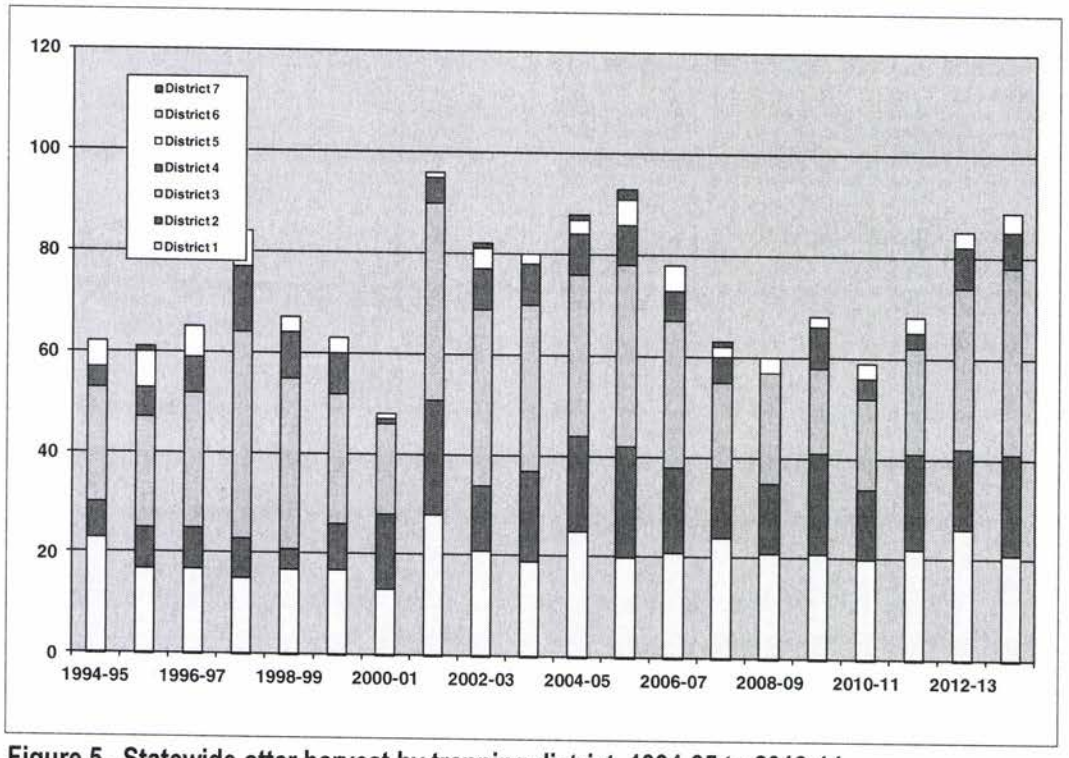

Figure 5. Statewide otter harvest by trapping district, 1994-95 to 2013-14.

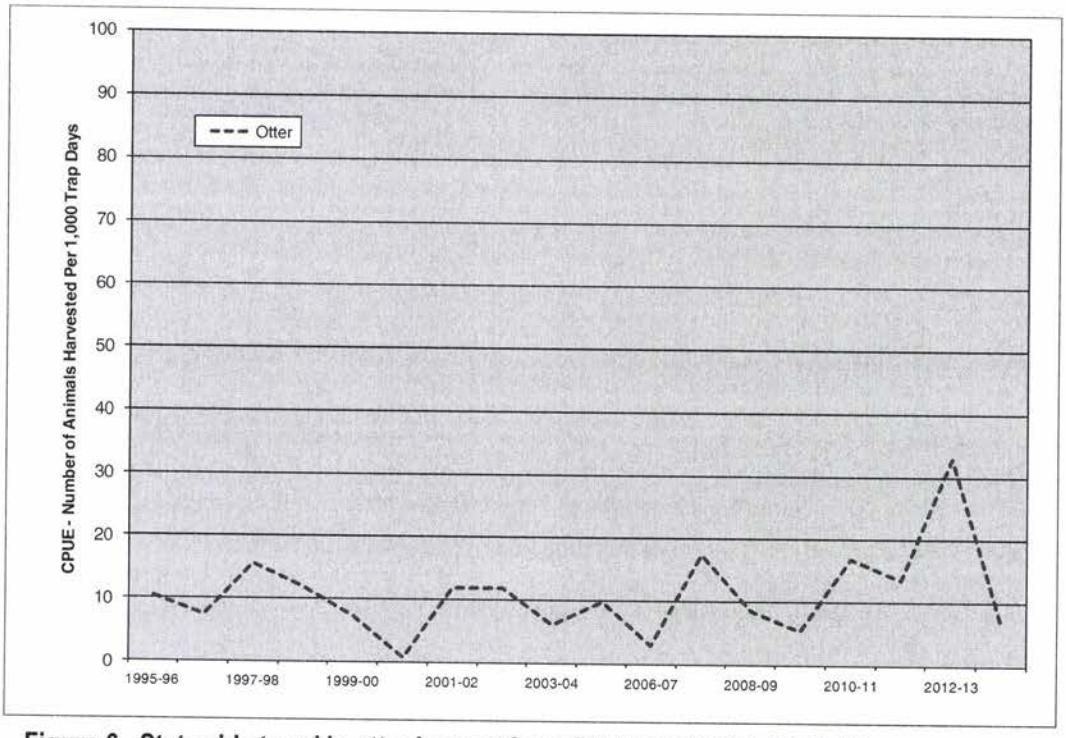

Figure 6. Statewide trend in otter harvest from CPUE, 1995-96 to 2013-14.

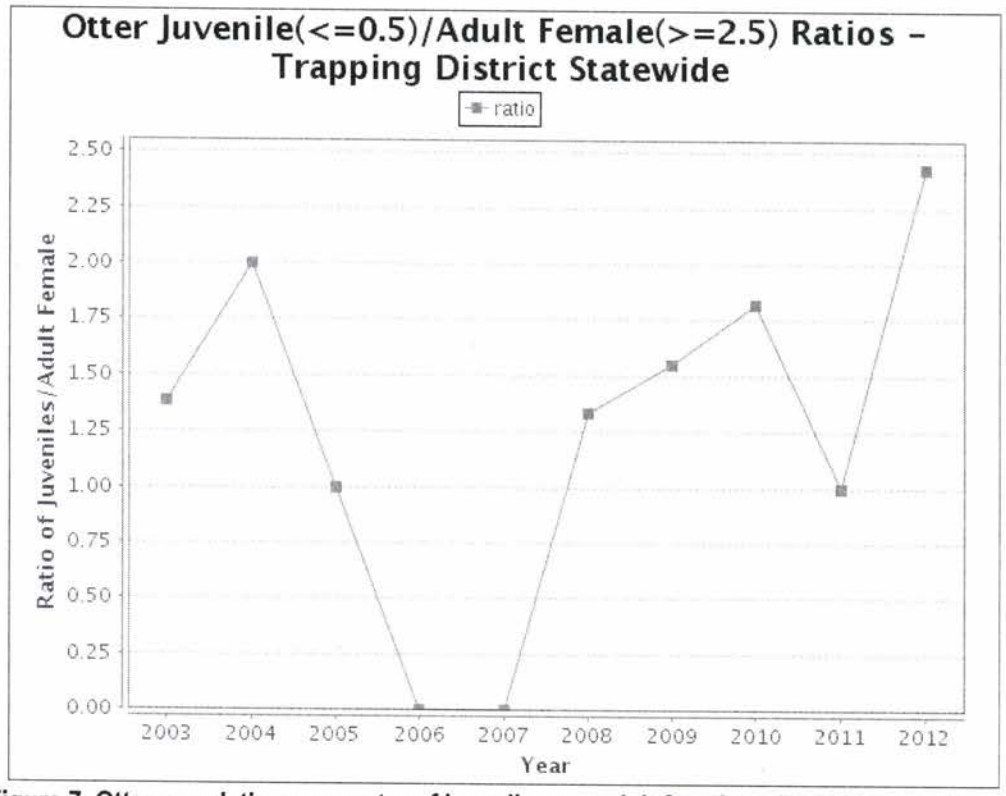

Figure 7. Otter population parameter of juveniles per adult female ratio, 2003-04 to 2012-13.

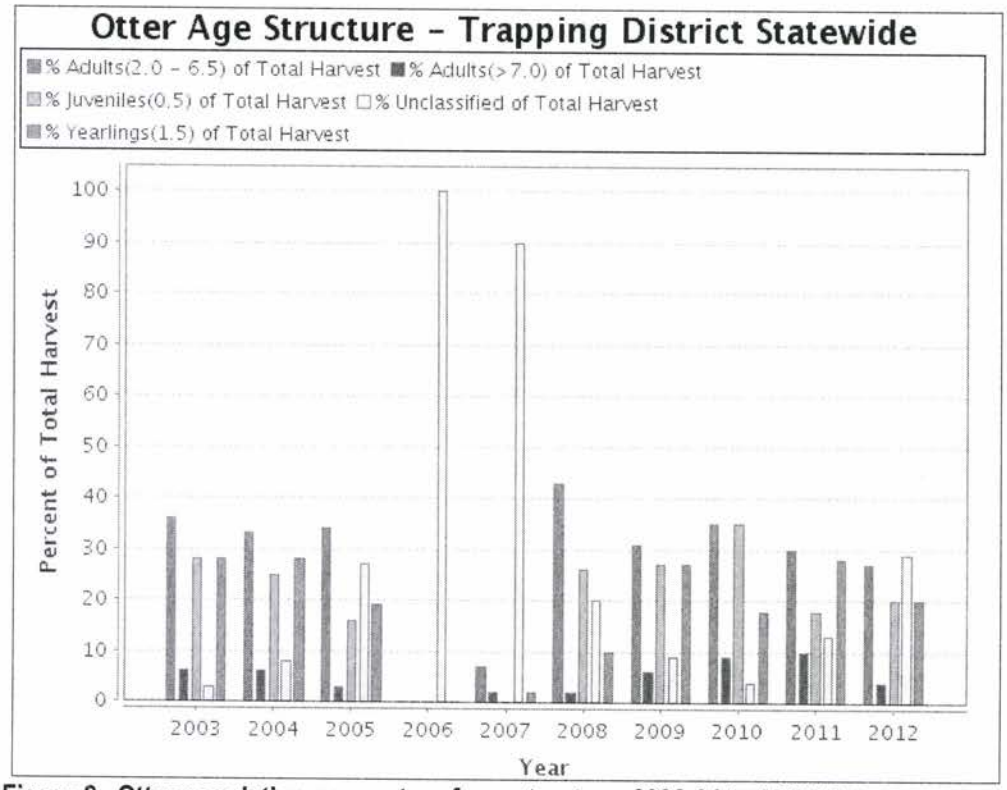

Figure 8. Otter population parameter of age structure, 2003-04 to 2012-13.

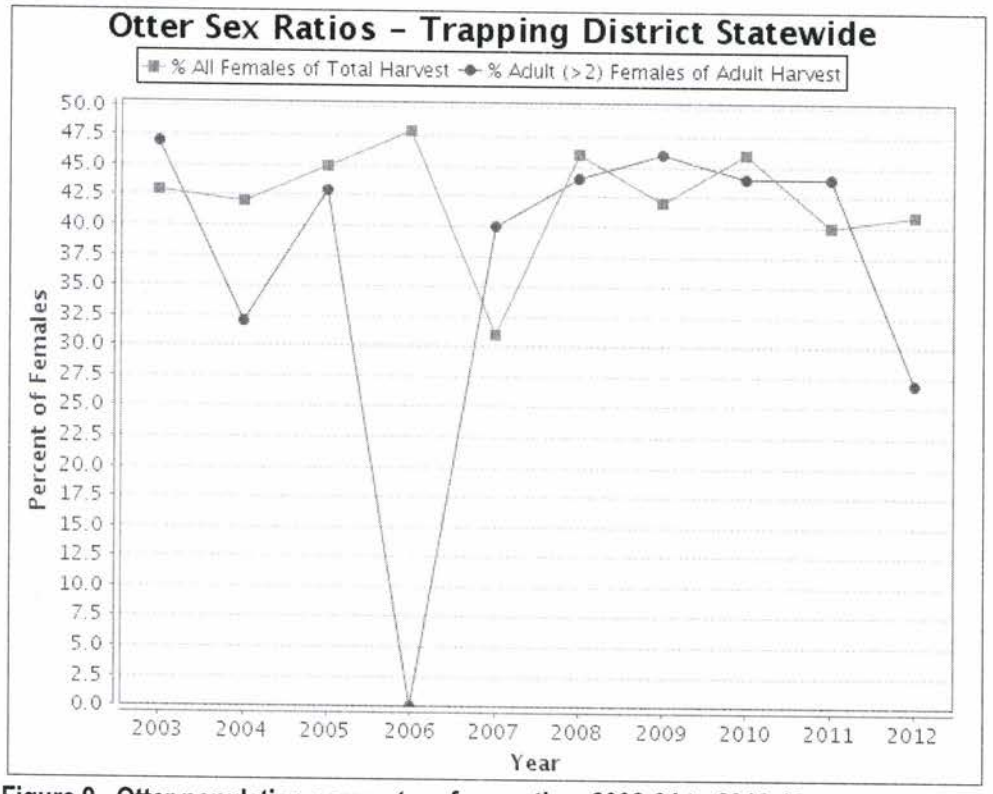

Figure 9. Otter population parameter of sex ratios, 2003-04 to 2012-13

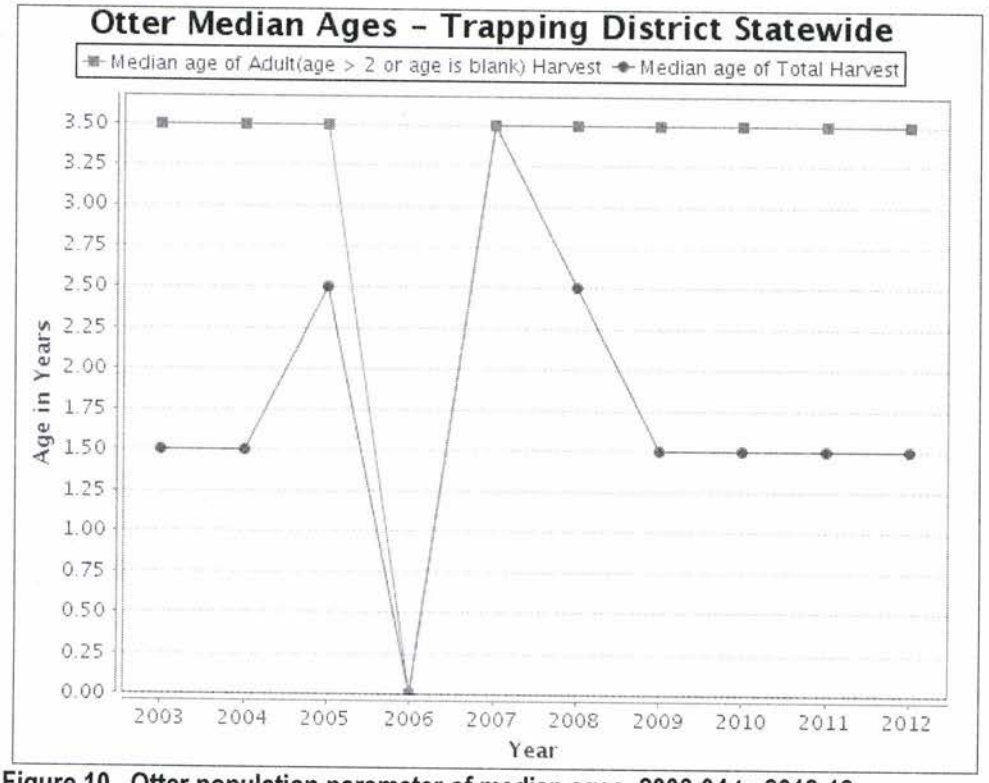

Figure 10. Otter population parameter of median ages, 2003-04 to 2012-13.

MUSKRAT

Although the statewide muskrat harvest has been increasing over the last several years, estimated harvest numbers declined during 2013-14 to 16,248 muskrats from the record high harvest of 27,731 animals in 2012-13 (Table 7). These high harvest numbers during the previous several years was likely influenced by much higher than average pelt prices in the $10.00 to $11.00 range compared to previous year's average pelt price of around $2.00. However, despite an $11.41 average price for 2013-14 the muskrat harvest declined by 41% from the previous year and 6% below the 10-year average harvest of 17,340 animals (Fig. 11) which could indicate a declining population.

Population monitoring activities for muskrat are based completely on trapper harvest survey data, with CPUE from the harvest survey considered to be an indicator of relative population trend, which could be considered as decreasing, with a declining CPUE starting in 2011-12 and through 2013-14 (Fig. 12). Examining this trend it appears catch rates have been decreasing indicating that over the last several years less muskrat are being taken per unit of effort, possibly indicative of much higher harvest numbers and trapping pressure contributing to a declining statewide population (Fig.12). A comparison of CPUE for muskrat with the other semi-aquatic species is shown in Fig. 47.

Table 7. Muskrat harvest, pelt price, and harvest quota if applicable, 1994-95 to 2013-14.

Year	TD 1	TD 2	TD 3	TD 4	TD 5	TD 6	TD 7	State	Pelt Price	Quota
1994-95	1393	4905	4394	2152	925	404	83	14256	1.67	
1995-96	716	4177	3271	1791	1276	181	39	11727	2.82	
1996-97	2980	3992	2732	3712	1799	772	134	16121	3.83	
1997-98	2552	3887	5043	3519	1499	2122	205	18826	1.94	
1998-99	2270	2240	3495	2609	709	811	111	12243		
1999-00	1643	3156	2651	3049	794	763	1191	13247		
2000-01	897	6170	2905	536	2844	129	361	13842	1.71	
2001-02	556	5681	3409	599	596	132	43	11070	2.07	
2002-03	1427	3915	4571	952	308	156	119	11448	2.11	
2003-04	869	3923	5625	864	318	45	270	11915	2.15	
2004-05									2.25	
2005-06	1561	4902	9862	2203	888	1217	637	21270	3.51	
2006-07	1850	4821	5210	2418	1868	728	117	17014	3.21	
2007-08	510	806	1188	761	522	442	146	10042	3.23	
2008-09	485	1131	2037	801	567	0	0	10699	2.55	
2009-10	852	2564	3054	1953	546	404	48	12754	4.23	
2010-11	949	1977	4452	4684	628	822	51	18494	6.66	
2011-12	1740	6304	11057	3180	705	3452	799	27236	10.19	
2012-13	4352	8247	8548	3089	1437	1727	330	27731	11.51	
2013-14	2256	4277	6163	1549	670	1011	319	16248	11.41	

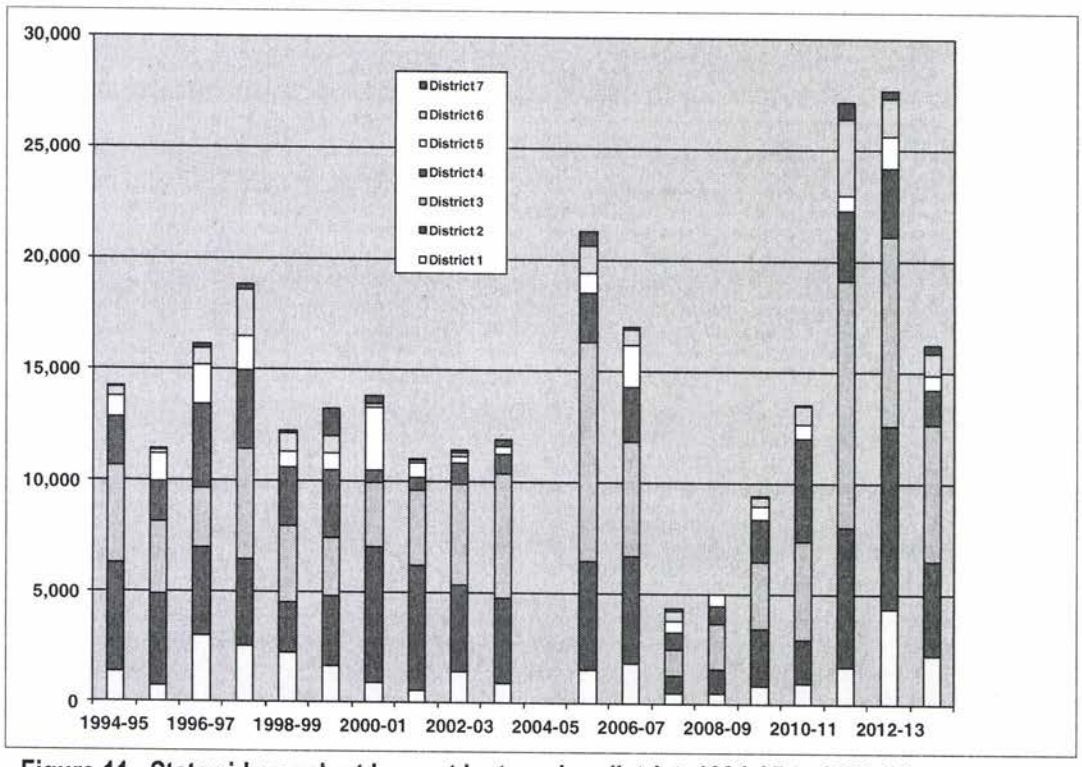

Figure 11. Statewide muskrat harvest by trapping district, 1994-95 to 2013-14.

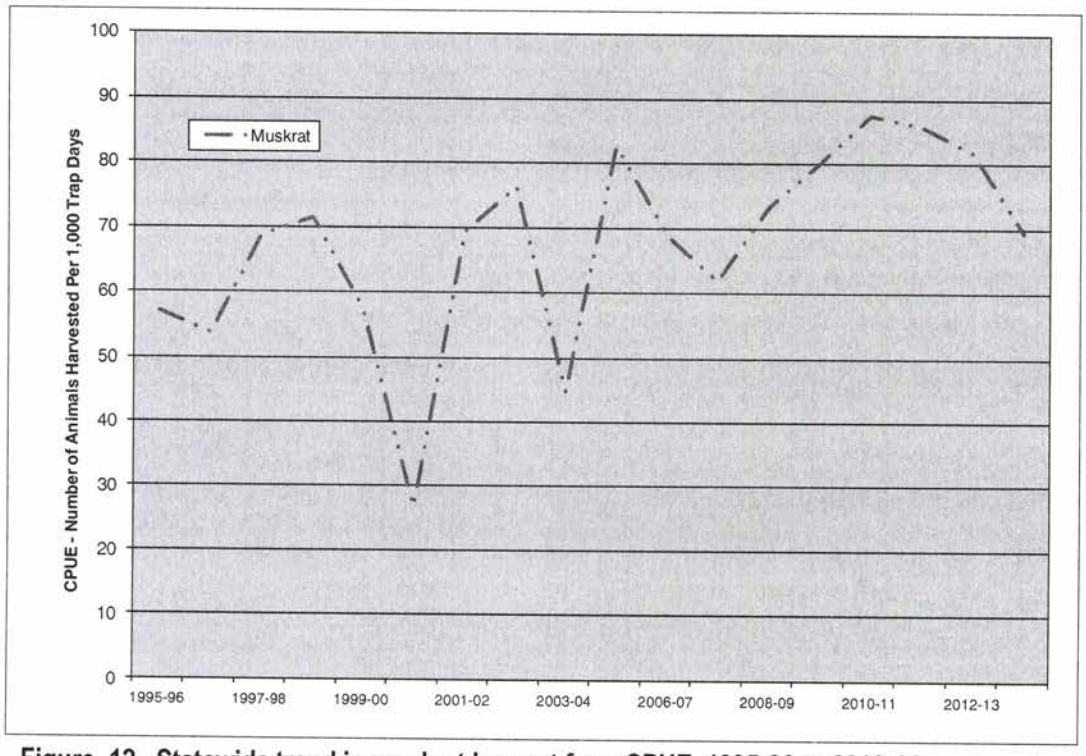

Figure 12. Statewide trend in muskrat harvest from CPUE, 1995-96 to 2013-14.

MINK

The statewide mink harvest has been steadily increasing over the past several years, but declined during the 2013-14 season to an estimated 1,024 animals (Table 8). Mink harvest is considered to be somewhat correlated to interest in muskrat trapping, which appears to be the case with the large decrease in 2013-14 muskrat harvest numbers. The estimated 2013-14 mink harvest was 4% above the 10-year harvest average (Fig. 13), along with above average pelt prices. The average value of mink pelts was the fourth highest level in the 10 year period (Table 8). Mink harvest levels are likely tied to landownership patterns and trapper access to streams and wetlands, and where muskrat can be found on public wetlands.

Population monitoring activities for mink are based completely on trapper harvest survey data, with the CPUE considered to be an indicator of relative population trend, which could be considered as stable, despite the estimated above average harvest during the 2012-13 season. When examining the trend in CPUE for mink, it appears harvest effort has generally remained stable, with some small changes in harvest effort that may be related to a corresponding interest in muskrat trapping, indicating that mink are being harvested at about a similar scale per unit of effort, at least through the 2013-14 season (Fig.14). A comparison of CPUE for mink with the other semi-aquatic species is shown in Fig. 47.

Table 8. Mink harvest, pelt price, and harvest quota if applicable, 1994-95 to 2013-14.

Year	TD 1	TD 2	TD 3	TD 4	TD 5	TD 6	TD 7	State	Pelt Price	Quota
1994-95	187	215	274	234	97	121	17	1145	9.31	
1995-96	140	290	111	126	128	87	34	919	9.16	
1996-97	252	134	339	488	126	280	20	1638	14.48	
1997-98	220	174	381	248	289	133	49	1493	9.54	
1998-99	285	162	309	171	120	27	3	1078		
1999-00	218	183	428	325	38	476	41	1709		
2000-01	95	198	1038	103	57	15	30	1536	8.37	
2001-02	111	300	307	89	61	43	32	959	10.05	
2002-03	92	229	564	94	13	38	40	1071	10.51	
2003-04	43	290	331	71	45	3	25	808	11.01	
2004-05									2.25	
2005-06	62	151	563	92	92	340	6	1306	15.01	
2006-07	94	269	678	129	158	18	3	1348	12.88	
2007-08	122	101	80	51	86	182	98	1018	15.22	
2008-09	62	85	127	20	28	0	0	655	11.53	
2009-10	40	62	118	171	35	13	5	584	17.39	
2010-11	57	154	175	129	27	3	21	760	17.48	
2011-12	53	190	415	102	58	23	29	872	23.14	
2012-13	183	255	486	153	102	298	13	1491	20.05	
2013-14	70	148	448	169	36	131	22	1024	21.10	

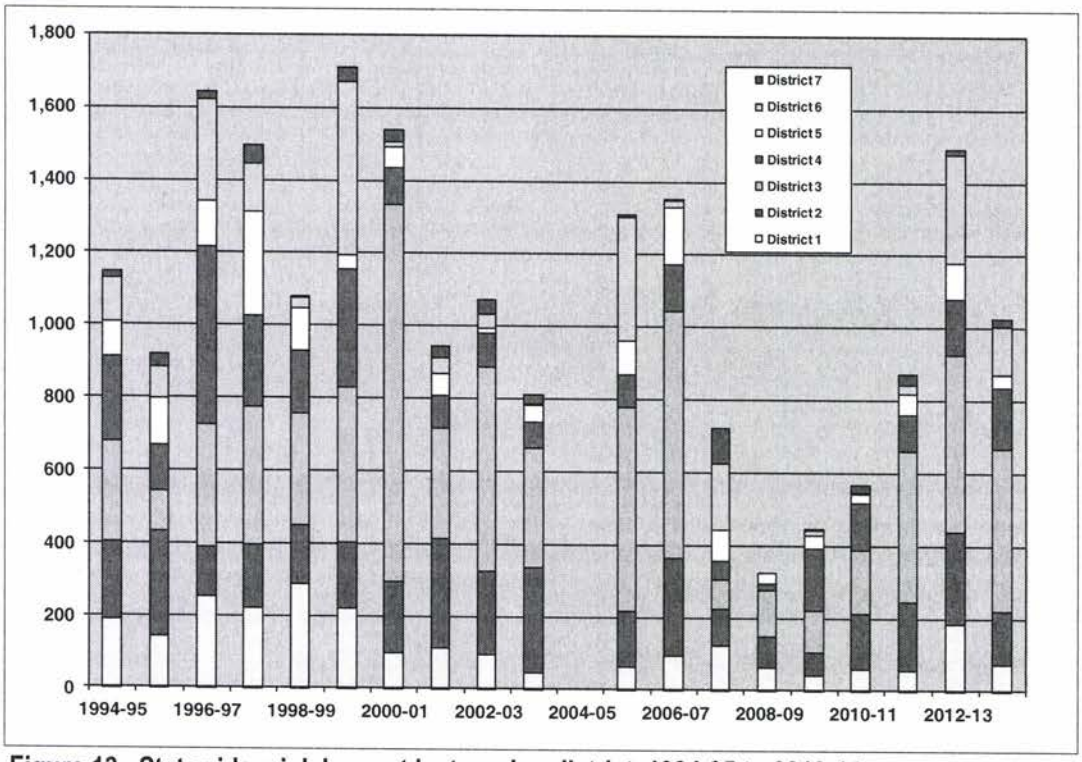

Figure 13. Statewide mink harvest by trapping district, 1994-95 to 2013-14.

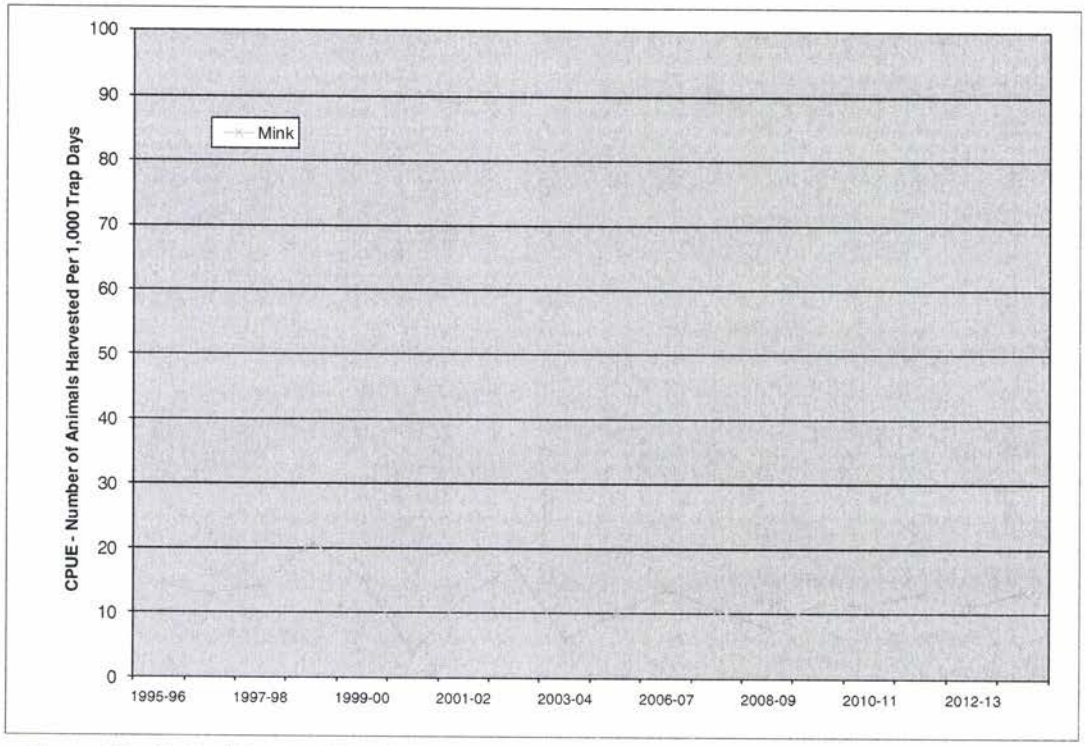

Figure 14. Statewide trend in mink harvest from CPUE, 1995-96 to 2013-14.

MARTEN

Marten are one of the five furbearers that are required to be pelt registered and pelt tagged so that the actual number of harvested animals is known. The statewide marten harvest continued to increase, with an increasing harvest trend during the past several years including 2013-14 (Fig. 15). The 2013-14 harvest of 1,828 marten was 40% above the 10-year average and at the highest harvest level over the past 20 years. The higher harvest in 2013-14 most likely corresponds to a similar above average pelt price value (Table 9). Examining the trend in CPUE it appears harvest effort has remained relatively stable or slightly declined on a statewide basis, indicating less marten are being taken per unit of effort (Fig.16). Also, the 2013-14 distribution of the marten harvest is apparently stronger in TD 2 in the west central part of the state and in TD 3 in southwestern Montana (Fig. 15). Primary marten habitat is exclusively on public forest lands.

Population monitoring for marten previously consisted of analyzing harvest data and using the collection and analysis of biological data from the harvest sample through mandatory skull turn-in from trappers. However, marten skull collections were discontinued beginning with the 2008-09 season because of the difficulty in reconciling individual skulls to male/female categories for classifying age data, therefore this information is no longer available. However, the sex of marten is collected so the 10-year average percentage of females in the harvest is 33% which seems to be remaining constant through 2013-14. The statewide harvest trend for marten using CPUE from the trapper harvest survey appears to indicate a stable to recently declining trend (Fig.16) and a comparison of marten CPUE with the other terrestrial species is presented in Fig. 48.

Table 9. Marten harvest, pelt price, and harvest quota if applicable, 1994-95 to 2013-14.

Year	TD 1	TD 2	TD 3	TD 4	TD 5	TD 6	TD 7	State	Pelt Price	Quota
1994-95	868	315	131	4	5			1323	15.01	
1995-96	433	167	202	0	0			802	19.17	
1996-97	513	172	143	0	2			830	25.01	
1997-98	403	291	192	9	5			900	17.25	
1998-99	473	172	61	3	7			716		
1999-00	313	183	149	1	7			653	19.33	
2000-01	560	326	174	1	3			1064	19.95	
2001-02	359	220	266	0	0			845	18.71	
2002-03	419	241	390	3	0			1053	19.51	
2003-04	459	339	259	2	3			1062	20.51	
2004-05	290	374	560	3	21			1248	19.51	
2005-06	280	265	370	1	36			952	45.51	
2006-07	143	268	418	2	25			856	61.57	
2007-08	245	446	441	0	9			1141	77.29	
2008-09	170	366	282	0	26			844	37.58	
2009-10	99	402	192	0	18			711	47.76	
2010-11	184	363	333	0	52			932	61.98	
2011-12	353	420	308	2	1			1083	55.94	
2012-13	293	656	459	8	27			1443	84.70	
2013-14	399	709	667	4	49			1828	85.92	

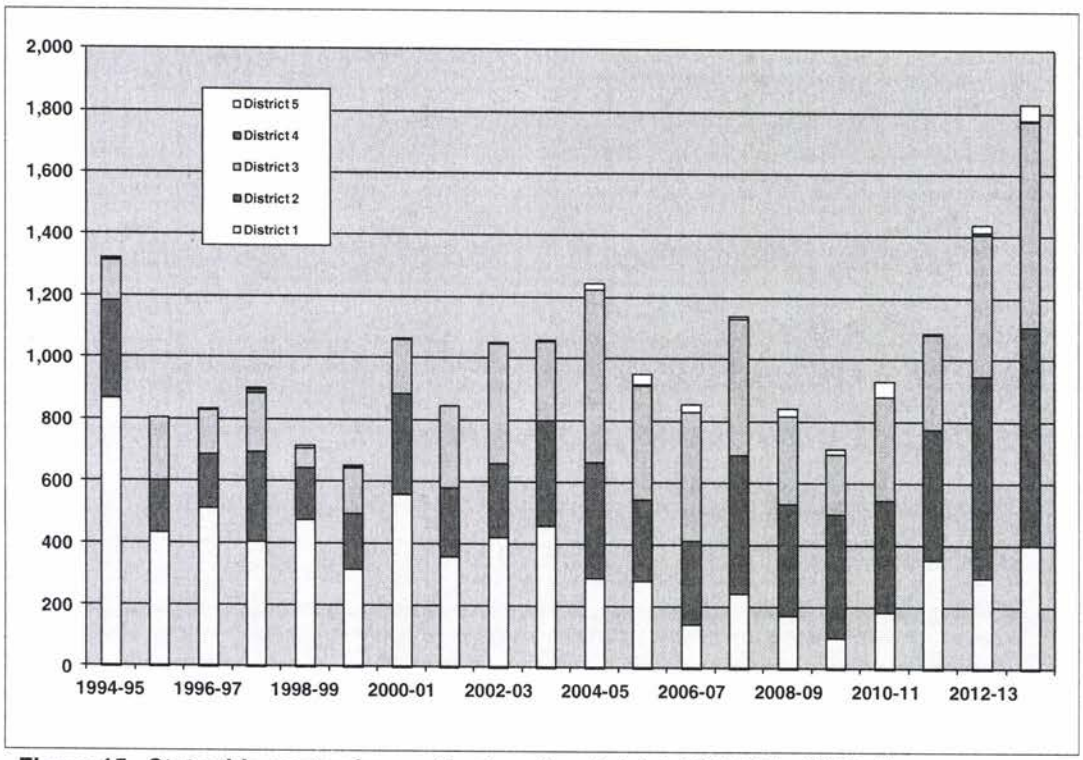

Figure 15. Statewide marten harvest by trapping district, 1994-95 to 2013-14.

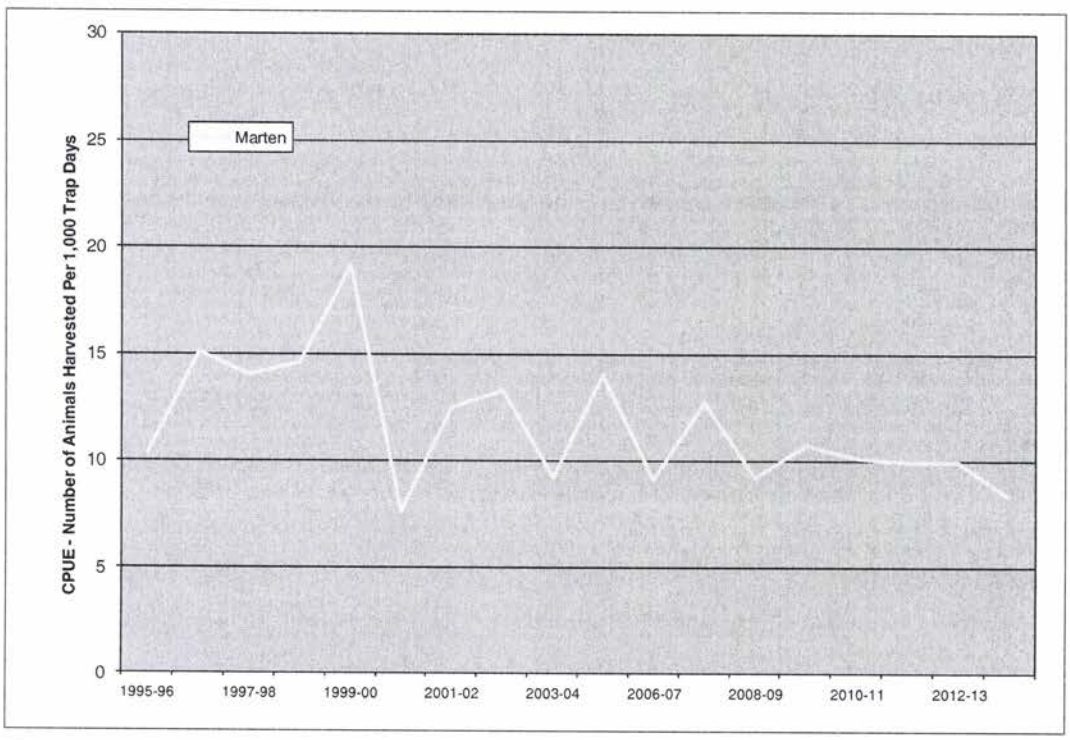

Figure 16. Statewide trend in marten harvest from CPUE, 1995-96 to 2013-14.

FISHER

The fisher harvest has been managed through a trapper limit of one with quotas in TD 1 and 2. Quotas have provided a sustainable trapper harvest that is conservatively matched with maintenance of the current fisher population size and distribution relative to available habitats. A predictive habitat model indicates that moderate to high suitability fisher habitats comprise approximately 6,504 mi^2 in west central and northwestern Montana, with TD 2 having over 50% more high suitability habitat than TD 1. A female sub-quota is also in place of two females to add an additional measure of protection for the reproductive segment of the population, to further insure harvest has no influence on statewide population status. Given fisher distribution relative to habitat availability, fisher habitat capacity appears to be correlated with similar levels of occupancy that is not impacted by a history of highly managed harvest. Fisher are one of the five furbearers that are required to be reported, registered and pelt tagged so the actual number of harvested animals is known. The fisher harvest continues to remain stable under the current quota system (Fig. 17), despite higher pelt prices (Table 10). The 2013-14 harvest of 7 fishers is near the 10-year average harvest.

Population monitoring for fisher consists of analyzing harvest data and using the collection and analysis of biological data from the harvested animals through mandatory carcass turn-in from trappers. The trend in fisher harvest effort using CPUE has been a relatively stable trend (Fig.18). A comparison of fisher CPUE with the other terrestrial species is presented in Fig. 48. Harvested fishers provide an extremely small sample size, so population parameters do not allow a lot of interpretation, and age data is not yet available from the 2013-14 season. However, the small amount of data that is available through 2012-13 appears to show that the population trend from these parameters is about two juveniles per adult female (Fig. 19), a mixed age structure with a good representation of juveniles in most years (Fig. 20), a low female sex ratio in most years (Fig. 21), with a higher than expected median age of adults and expected median age of the total harvest (Fig. 22).

Table 10. Fisher harvest, pelt price, and harvest quota if applicable, 1994-95 to 2013-14.

Year	TD 1	TD 2	TD 3	TD 4	TD 5	TD 6	TD 7	State	Pelt Price	Quota
1994-95	3	5						8		10
1995-96	0	2						2		10
1996-97	2	4						6		7
1997-98	1	6						7		7
1998-99	2	6						8		7
1999-00	0	5						5		7
2000-01	0	7						7	28.62	7
2001-02	2	5						7	25.12	7
2002-03	2	5						7	25.01	7
2003-04	2	6						8	28.11	7
2004-05	0	7						7	28.25	7
2005-06	3	6						9	35.01	7
2006-07	2	5						7	74.31	7
2007-08	1	5						6	87.51	7
2008-09	1	6						7	42.83	7
2009-10	1	5						6	50.08	7
2010-11	1	7						8	47.58	7
2011-12	2	5						7	74.99	7
2012-13	3	3						6	145.30	7
2013-14	2	5						7	104.52	7

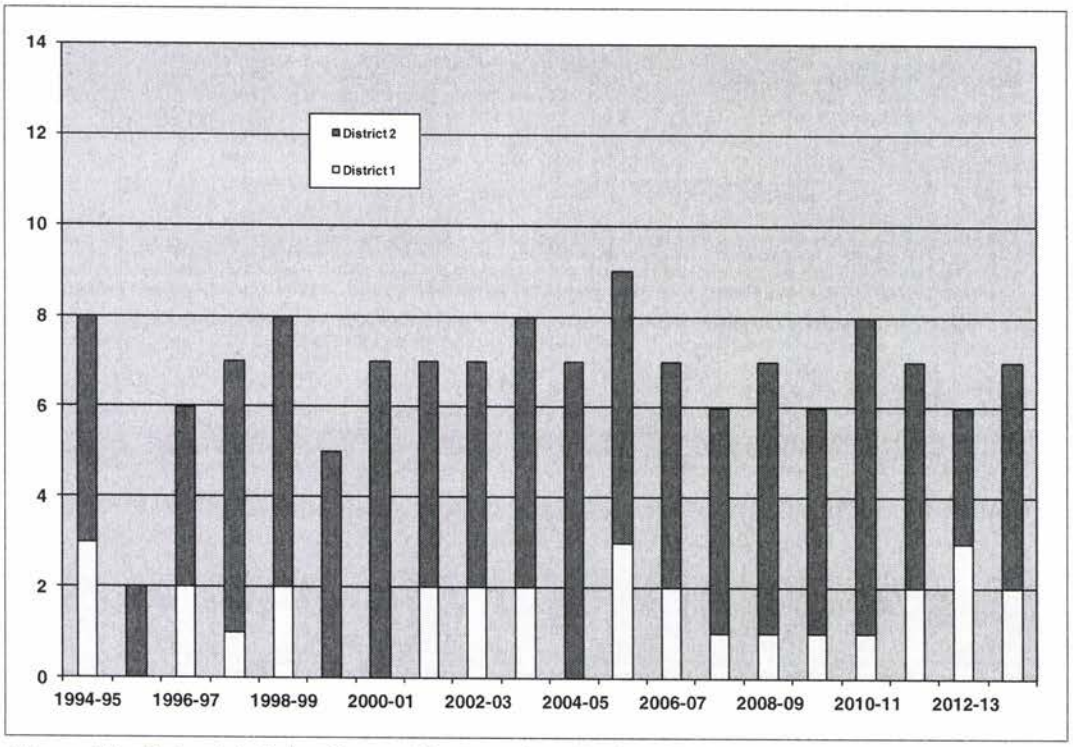

Figure 17. Statewide fisher harvest by trapping district, 1994-95 to 2013-14.

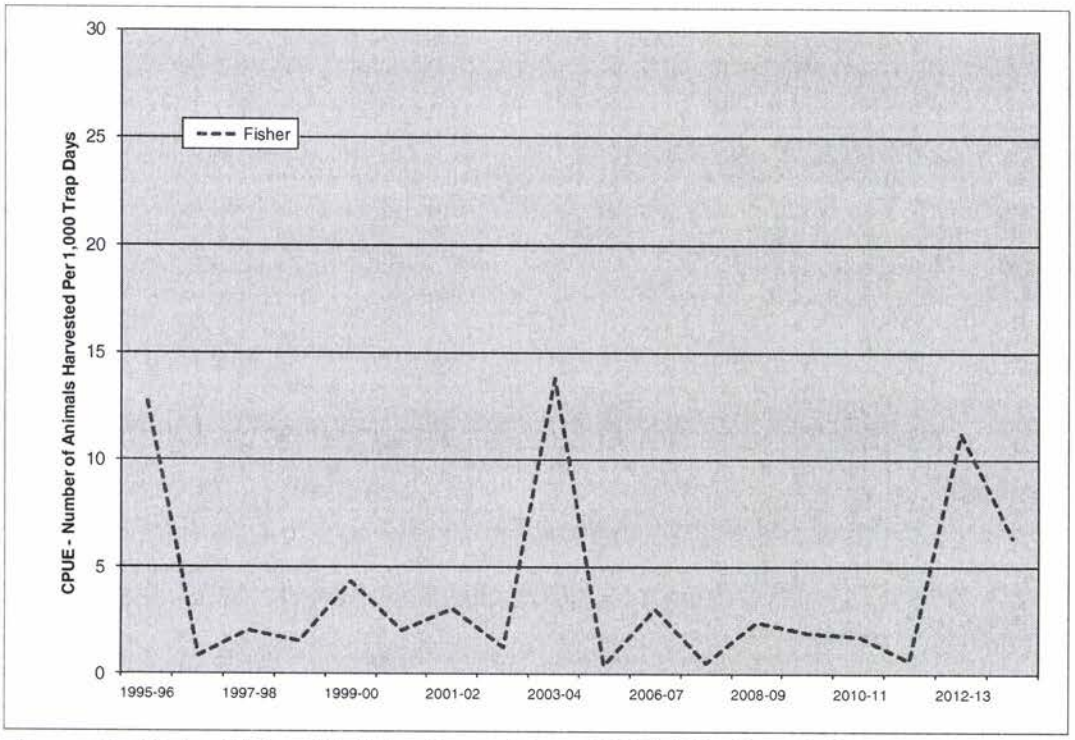

Figure 18. Statewide trend in fisher harvest from CPUE, 1995-96 to 2013-14.

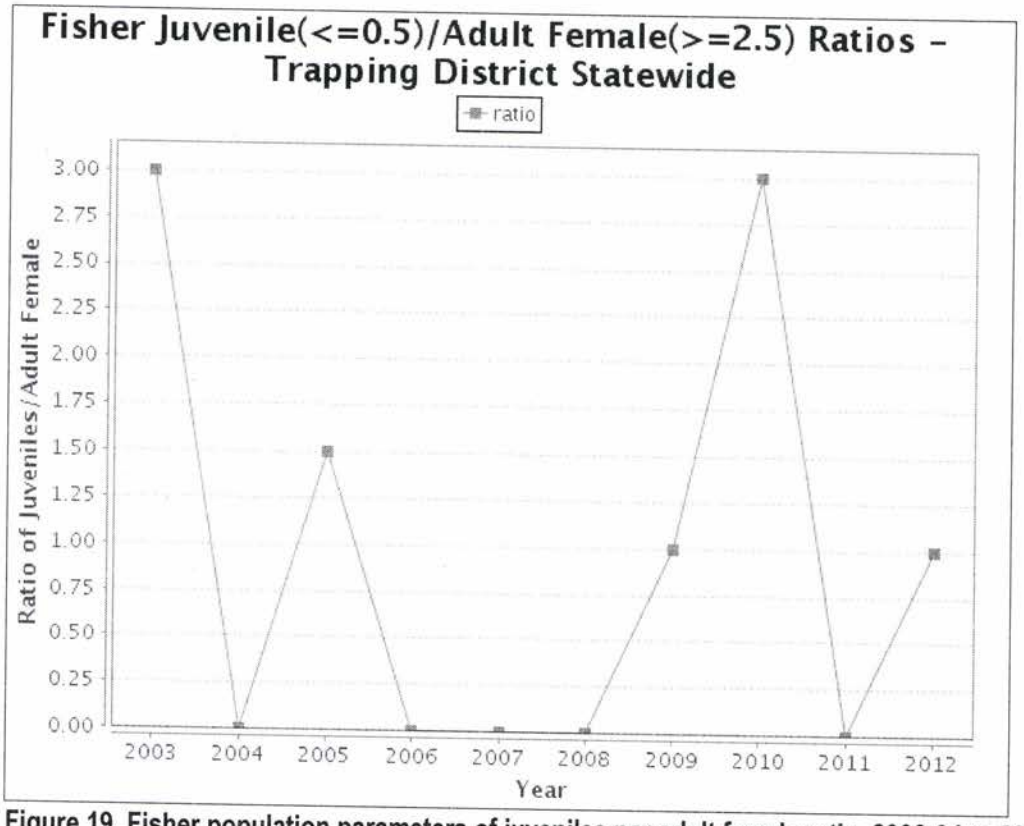

Figure 19. Fisher population parameters of juveniles per adult female ratio, 2003-04 to 2012-13.

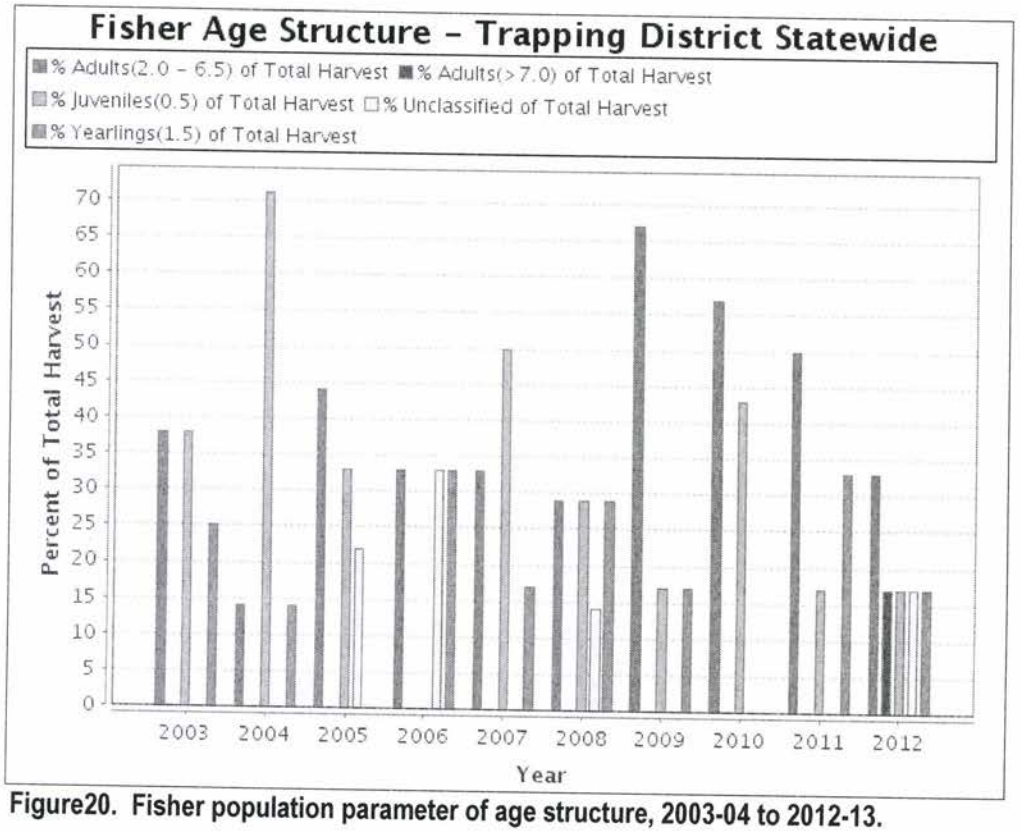

Figure20. Fisher population parameter of age structure, 2003-04 to 2012-13.

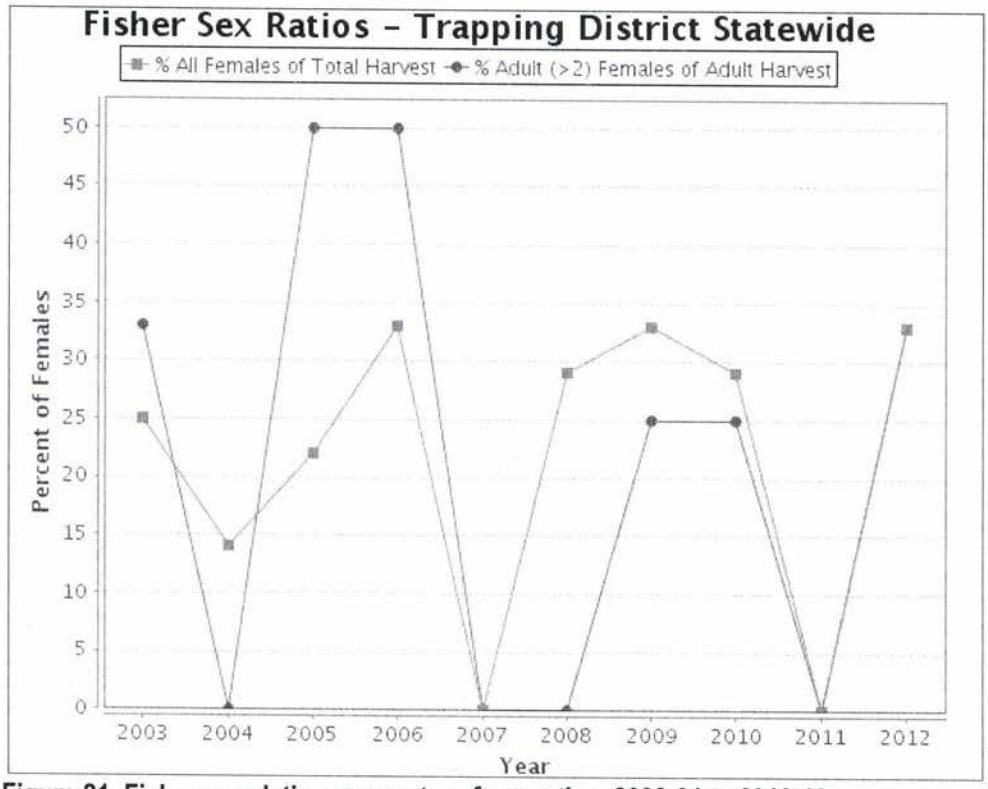

Figure 21. Fisher population parameter of sex ratios, 2003-04 to 2012-13.

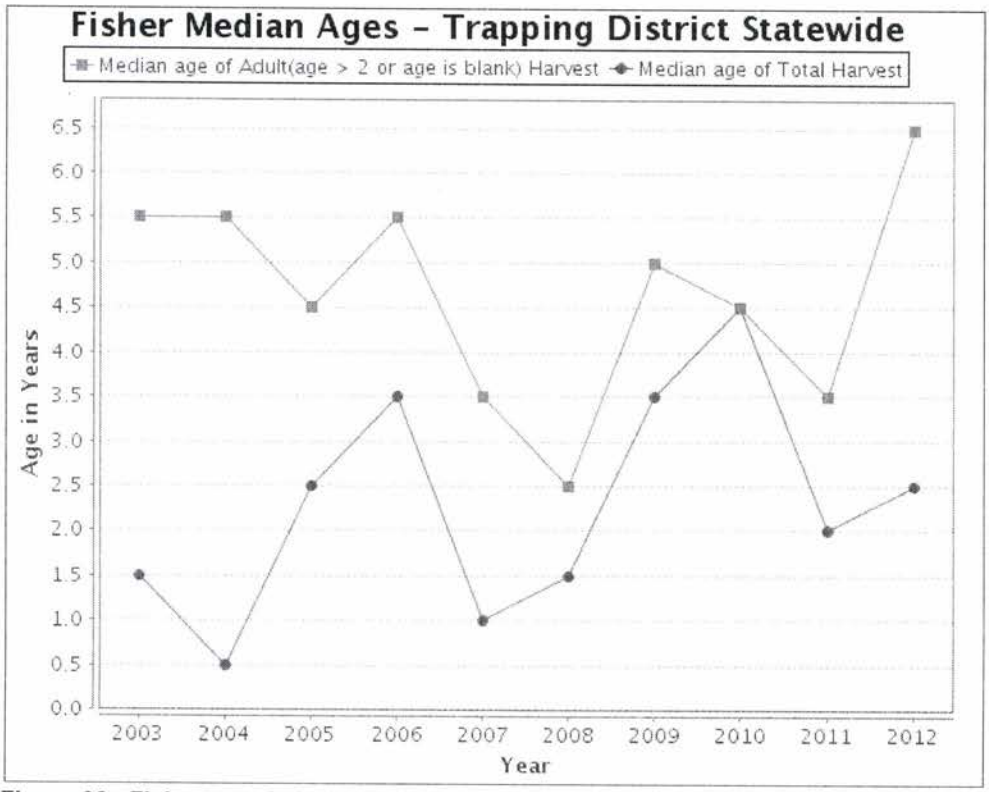

Figure 22. Fisher population parameter of median ages, 2003—04 to 2012-13.

WOLVERINE

Since wolverines were first classified as a state furbearer in the late 1970s, harvest was regulated by a one wolverine per trapper limit. Wolverines were considered to be recovered in Montana from a low point in the 1930s and now occupy the western half of the state. Statewide harvest during a 30-year period was considered stable and somewhat self-regulating with an average of 10.5 wolverine harvested annually (range 2 - 22 per year) during the period (Table 11). However, recent research on the species has provided new information regarding wolverine ecology, better defined wolverine habitat, examined genetic relationships, survival, and landscape connectivity. FWP's furbearer program provided funds and logistical support to these studies. Research results were used to develop a habitat model for Montana with corresponding population numbers and estimated sustainable harvest rates which were considered sustainable at a more regulated level (Fig.23). Therefore, FWP changed trapping regulations to reflect emerging information and additional data from wolverine research that suggested conservative quota levels were appropriate. Between 2008-09 and 12011-12 management units were established and quotas adjusted to associate harvest levels with the three largest intact ecosystems in the state (Northern Continental Divide, Bitterroot-Idaho and Greater Yellowstone) and to recognize the lower population sizes in insular mountain ranges in the central portion of Montana.. Further analysis tied to genetic make-up of the state's wolverine population, the issue of maintaining population connectivity, and recognizing the core population areas of the three major ecosystems led to additional regulation changes. These most recent adjustments included delineating four wolverine management units (WMUs) with the three major ecosystems having reduced quotas for a statewide total of 5 animals and a central Montana WMU with a quota of zero to promote population connectivity between the three major ecosystems in the state where harvest is allowed. Managing the WMU /quota system has maintained biologically sound harvest opportunity for resident trappers that does not jeopardize conservation of the species. However, with the pending decision by the USFWS to list wolverine under the ESA, the quota was reduced to zero during the 2012-13 season and that continued for the 2013-14 season, so no harvest has occurred to be include in this report period. Past population parameters prior to 2012-13 are presented Figs 25-28.

Table 11. Wolverine harvest, pelt price, and harvest quota if applicable, 1994-95 to 2013-14.

Year	TD 1	TD 2	TD 3	TD 4	TD 5	TD 6	TD 7	State	Pelt Price	Quota
1994-95	2	1	5	1	0			9		
1995-96	5	2	4	1	0			12	200.01	
1996-97	6	0	3	2	1			12		
1997-98	1	5	6	3	0			15		
1998-99	0	2	2	5	0			9		
1999-00	0	0	3	1	0			4		
2000-01	1	6	4	2	0			14	212.94	
2001-02	1	0	9	0	0			10	225.01	
2002-03	2	2	8	2	1			15	225.01	
2003-04	1	2	3	2	2			10	275.01	
2004-05	3	1	6	1	0			11	275.01	12
2005-06	0	4	4	2	1			11	300.01	12
2006-07	2	0	5	2	0			9	217.85	12
2007-08	2	1	5	1	0			9	280.35	10
2008-09	2	0	0	2	0			4	254.67	5
2009-10	1	1	1	0	0			3	211.42	5
2010-11	0	3	1	0	0			4	253.15	5
2011-12	0	2	0	0	0			2	319.67	5
2012-13	0	0	0	0	0			0	235.74	0
2013-14	0	0	0	0	0			0	232.43	0

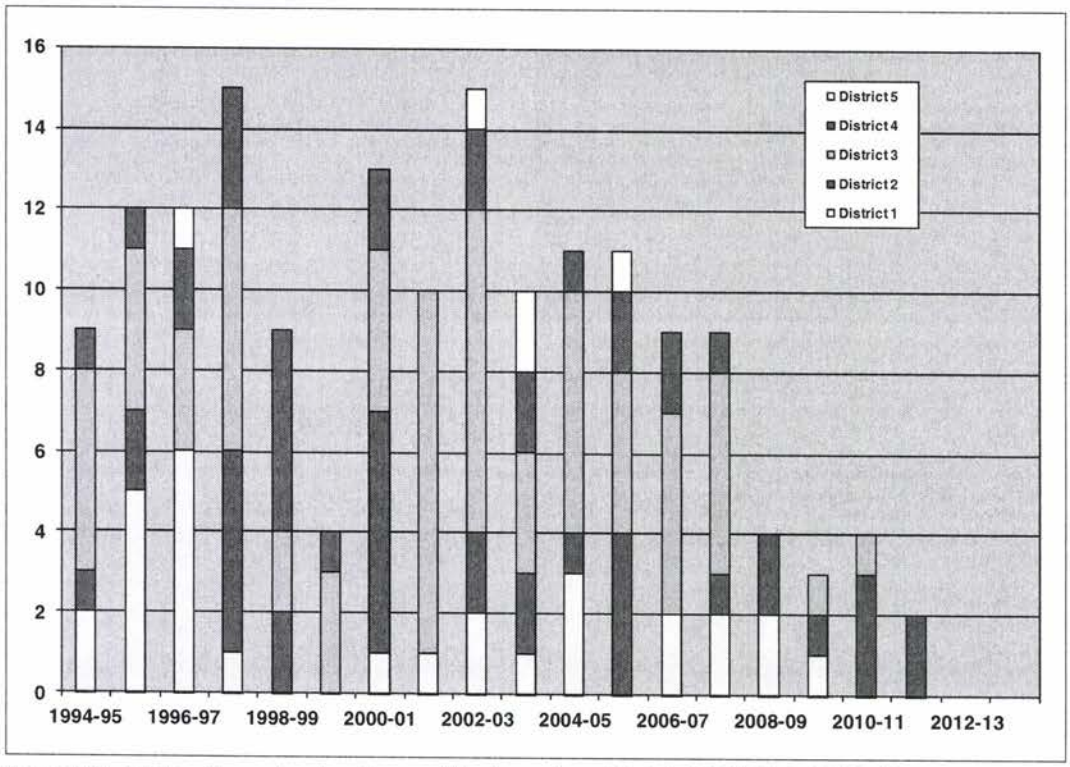

Figure 23. Statewide wolverine harvest by trapping district, 1994-95 to 2013-14.

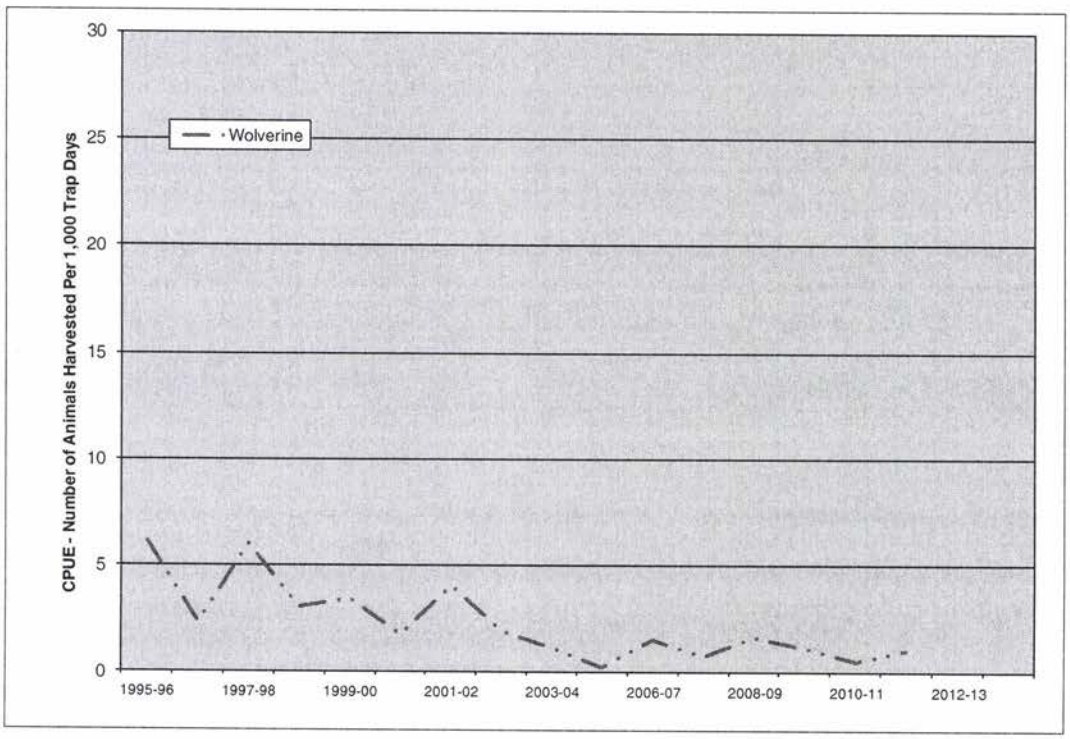

Figure 24. Statewide trend in wolverine harvest from CPUE, 1995-96 to 2013-14.

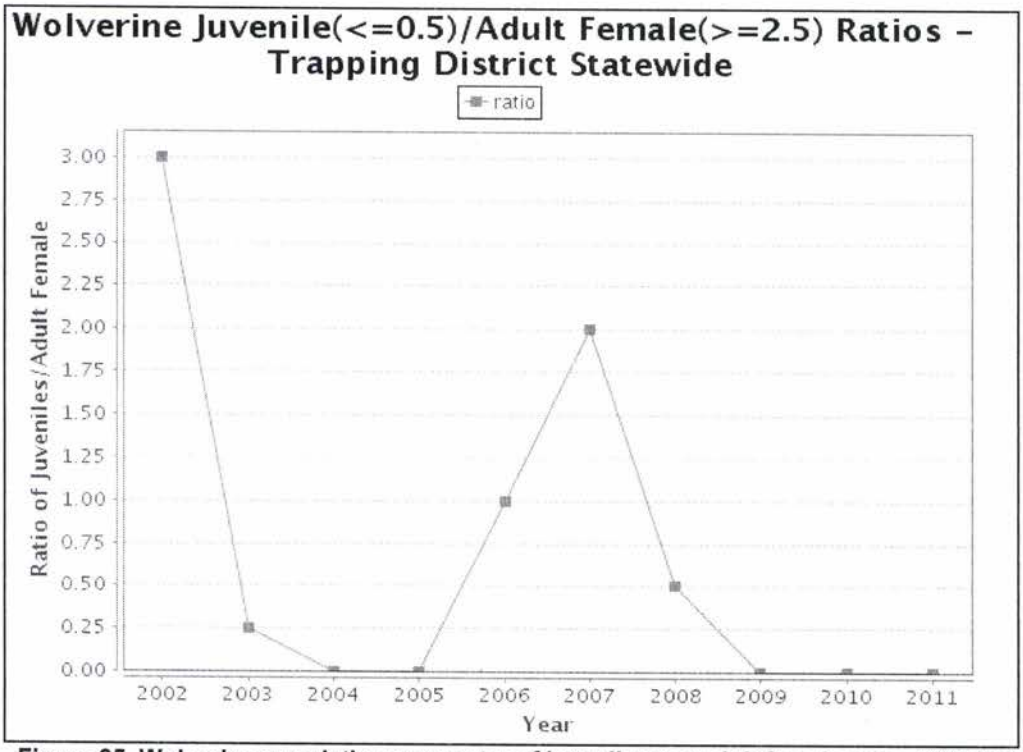

Figure 25. Wolverine population parameter of juveniles per adult female ratio, 2002-03 to 2011-12.

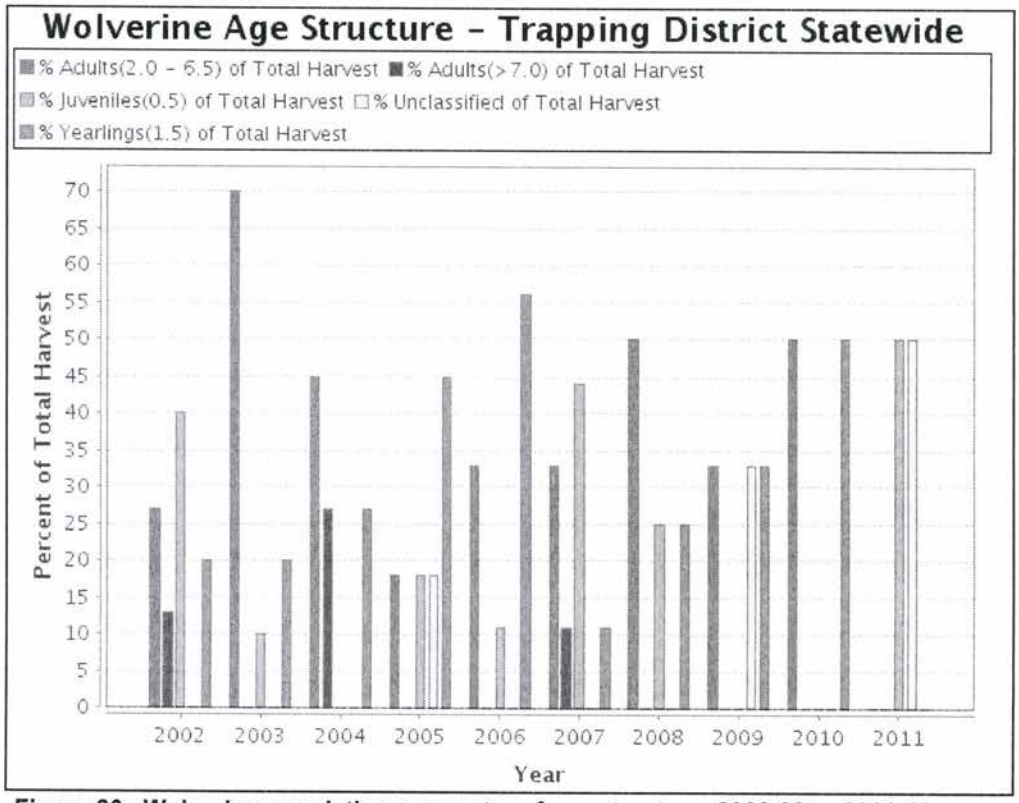

Figure 26. Wolverine population parameter of age structure, 2002-03 to 2011-12.

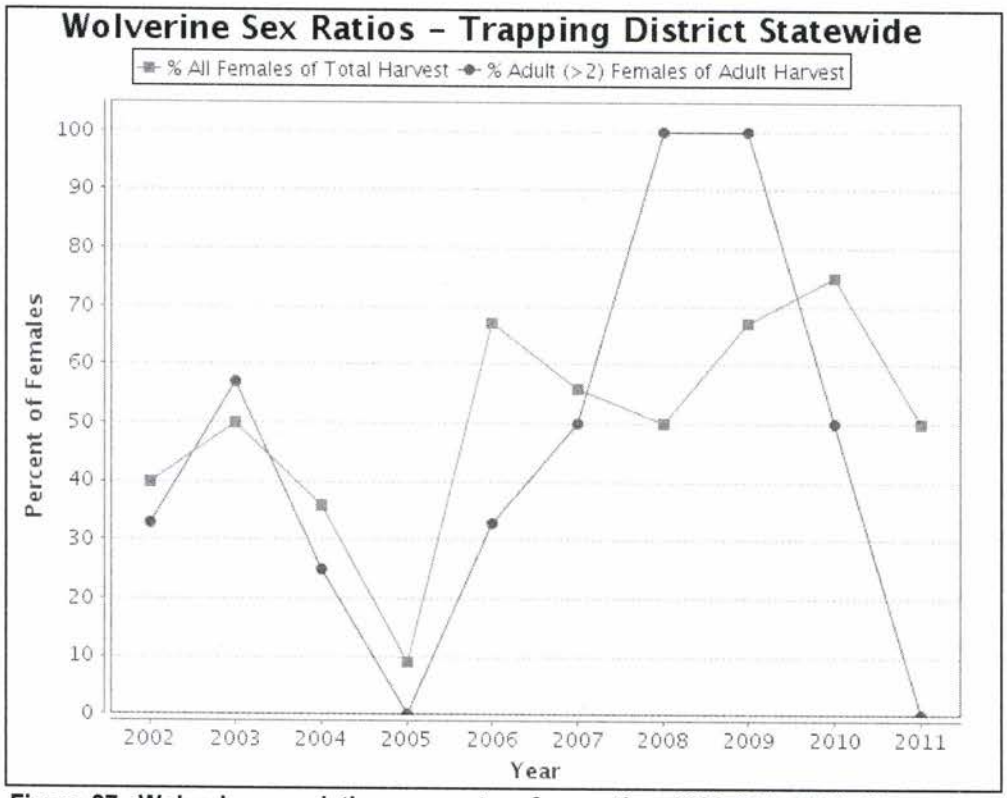

Figure 27. Wolverine population parameter of sex ratios, 2002-03 to 2011-12.

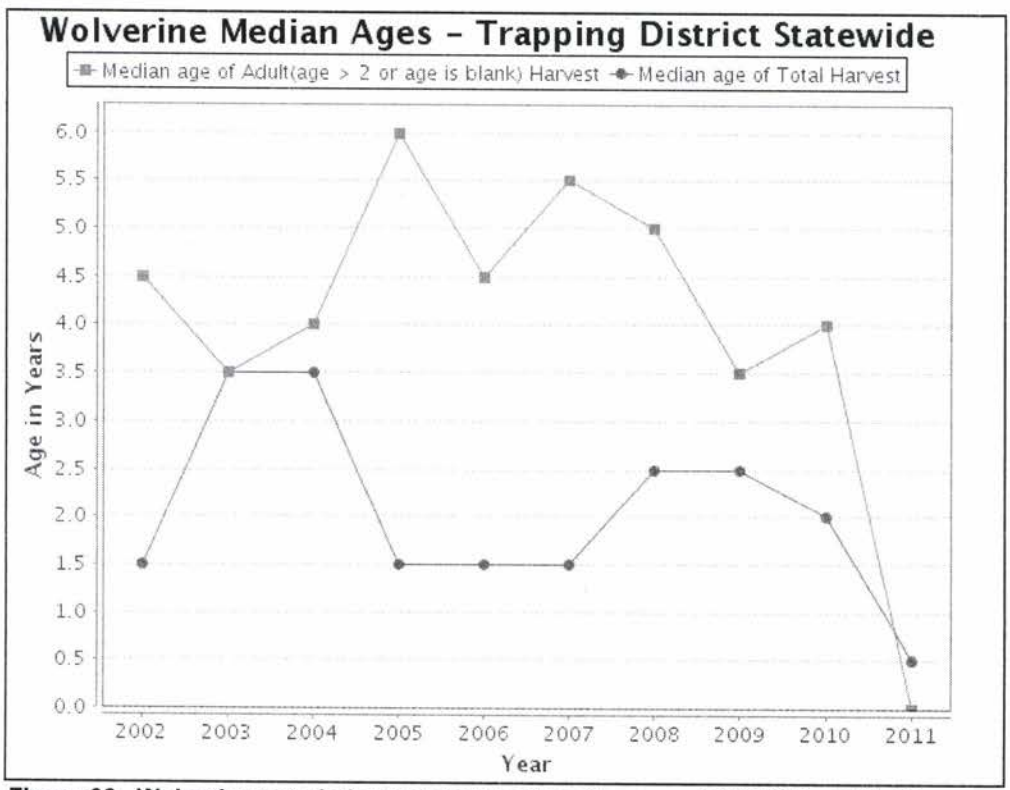

Figure 28. Wolverine population parameter of median ages, 2002-03 to 2011-12.

BOBCAT

Bobcats are one of the five furbearers that are required to be reported, registered and pelt tagged so that the actual number of harvested animals is known (Table 12). The bobcat harvest has always been managed through TD quotas with various trapper limits or no trapper limits. In the late 1990s trapper limits were increased in response to low trapper interest in bobcats because of relatively low pelt prices (Table 12) and later removed altogether in the eastern districts (TD 4 – 7). Adjustments in bobcat quotas have been used as a management tool to maintain healthy bobcat populations, while providing opportunity and flexibility to harvest bobcat by the trapping community. As bobcat populations in the state have increased over time, along with trapper interest, TD quotas have generally increased proportionately. The statewide quota has increased from 1,415 in 1994-95 to 2,480 in 2008-09 and 1,945 during the 2013-14 season (Table 12). The bobcat harvest has increased from 1,052 in 1994-95 to 2,428 in 2008-09 and 1,895 in 2013-14 (Fig. 29). Pelt prices have jumped dramatically beginning with the 2003-04 season and continue to remain at a high level through 2013-14 (Table 12). Examining the trend in CPUE it appears harvest effort has been stable to declining, indicating that fewer bobcat are being taken per unit of effort (Fig.30).

The statewide trend in bobcat using CPUE is declining slightly (Fig.30) and a comparison of bobcat CPUE with the other terrestrial species is presented in Fig 48. Population monitoring for bobcat consists of analyzing harvest data and the collection and analysis of biological data from the harvest sample through mandatory skull turn-in from trappers to extract a tooth to determine age. However, age data for the 2013-14 report period are not yet available for current analysis of population trend. Population parameters for the statewide bobcat population through 2012-13 is shown in Figs 31-34.

Table 12. Bobcat harvest, pelt price, and harvest quota if applicable, 1994-95 to 2013-14.

Year	TD 1	TD 2	TD 3	TD 4	TD 5	TD 6	TD 7	State	Pelt Price	Quota
1994-95	148	117	121	145	157	75	289	1052	81.75	1415
1995-96	169	113	105	105	109	12	149	762	75.42	1440
1996-97	166	108	133	174	165	45	250	1041	124.05	1440
1997-98	167	158	139	163	191	40	348	1206	95.25	1490
1998-99	173	159	134	133	197	68	229	1093	85.51	1490
1999-00	199	170	145	184	212	91	410	1411	98.67	1510
2000-01	222	168	128	173	230	86	391	1398	106.05	1630
2001-02	244	178	173	177	267	121	542	1702	135.25	1730
2002-03	201	146	199	193	315	135	597	1786	203.01	1805
2003-04	210	182	229	211	356	88	507	1783	280.25	1880
2004-05	225	172	218	312	424	135	628	2114	325.01	2030
2005-06	230	158	291	287	392	122	721	2201	345.01	2255
2006-07	243	177	294	320	426	91	677	2228	257.33	2255
2007-08	264	182	314	316	489	100	724	2389	449.45	2355
2008-09	258	184	292	298	503	71	822	2428	281.35	2480
2009-10	248	108	203	214	487	42	465	1767	346.54	2275
2010-11	278	113	216	245	406	26	360	1644	411.84	2175
2011-12	259	104	275	311	308	91	627	1975	426.31	1925
2012-13	280	196	273	281	299	53	557	1939	589.08	1970
2013-14	302	195	271	173	307	57	334	1639	393.49	1895

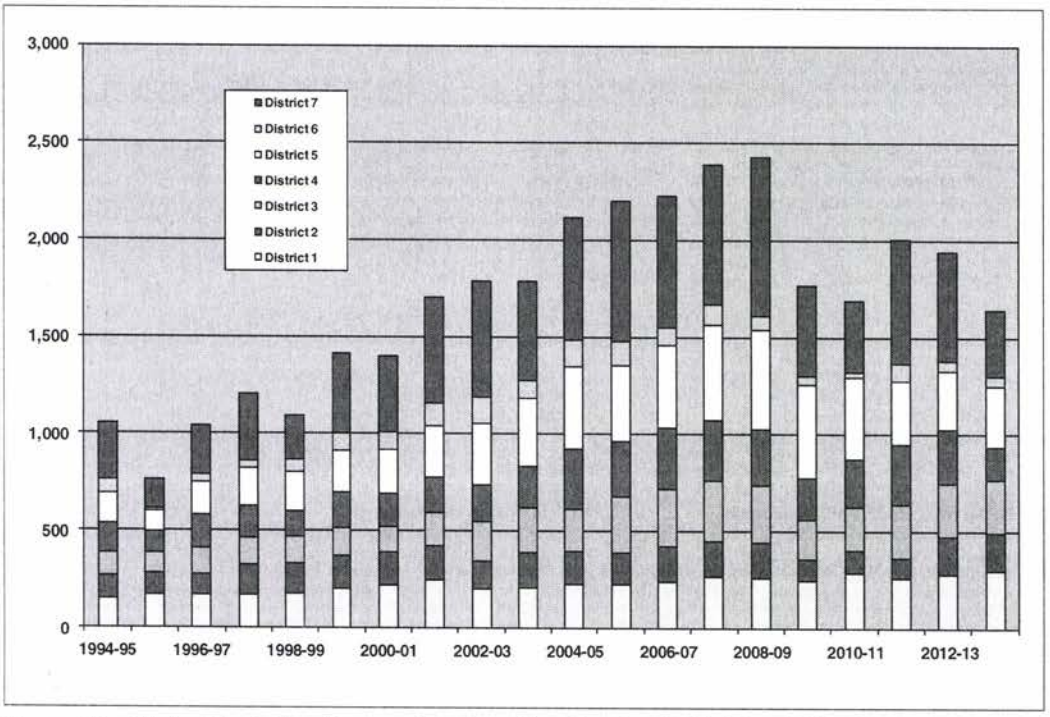

Figure 29. Statewide bobcat harvest by trapping district, 1994-95 to 2013-14

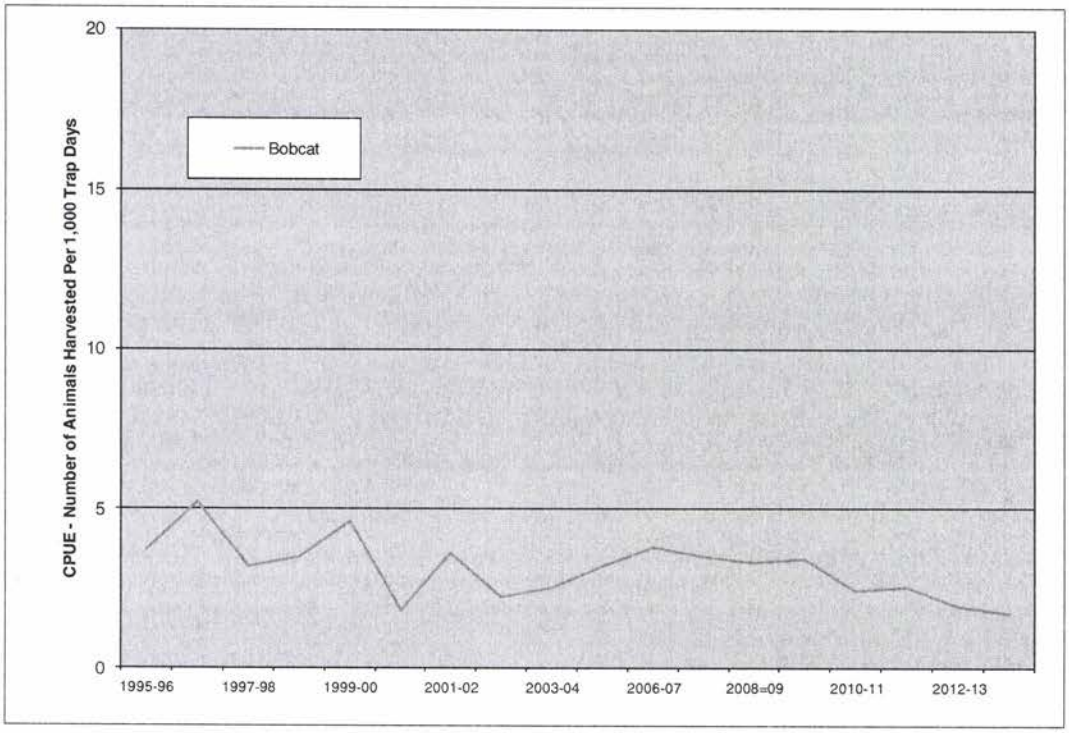

Figure 30. Statewide trend in bobcat harvest from CPUE, 1995-96 to 2013-14.

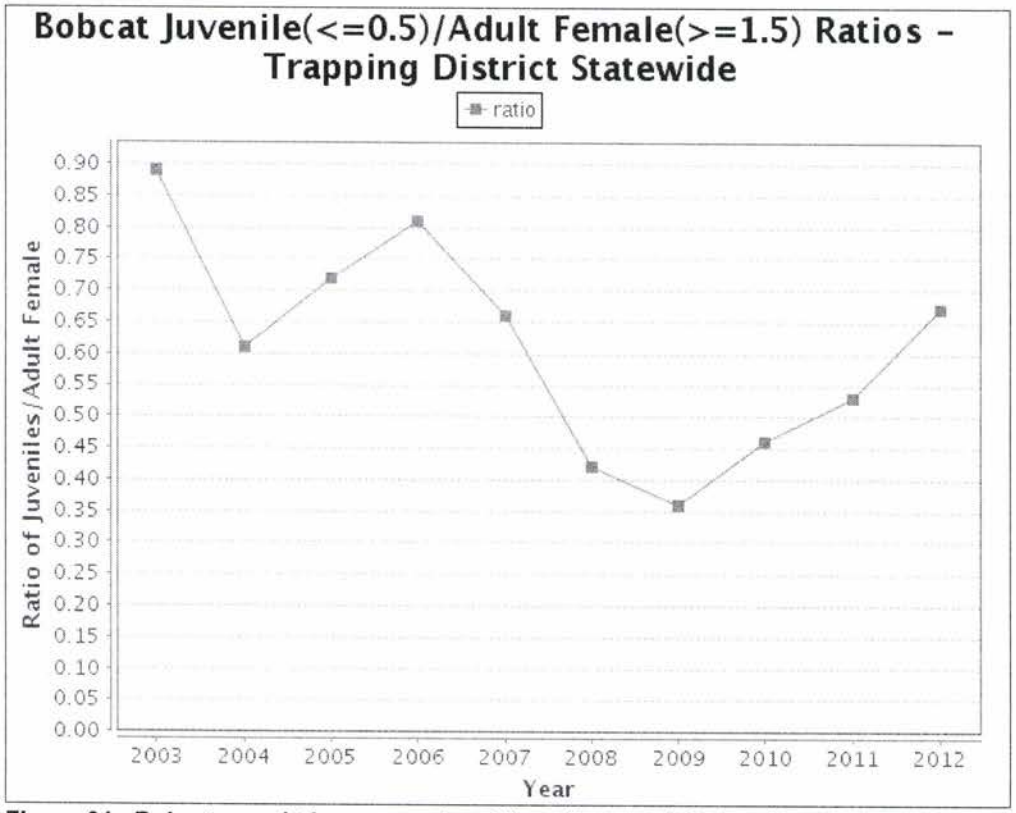

Figure 31. Bobcat population parameter of juvenile per adult female ratios, 2003-04 to 2012-13.

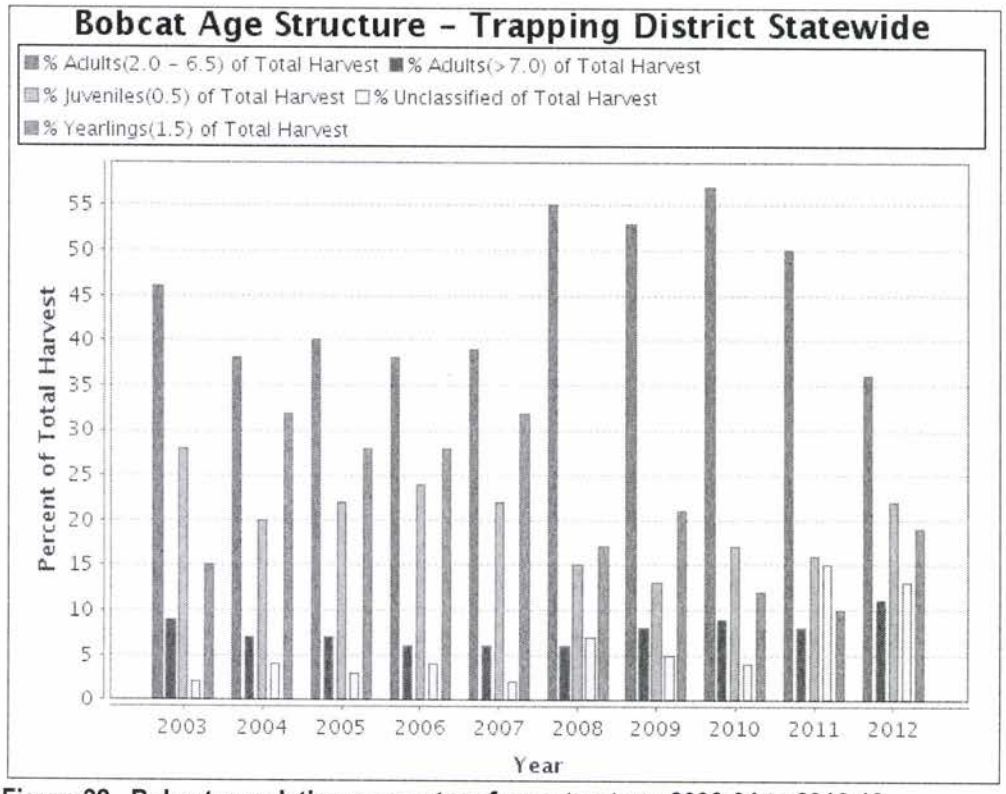

Figure 32. Bobcat population parameter of age structure, 2003-04 to 2012-13.

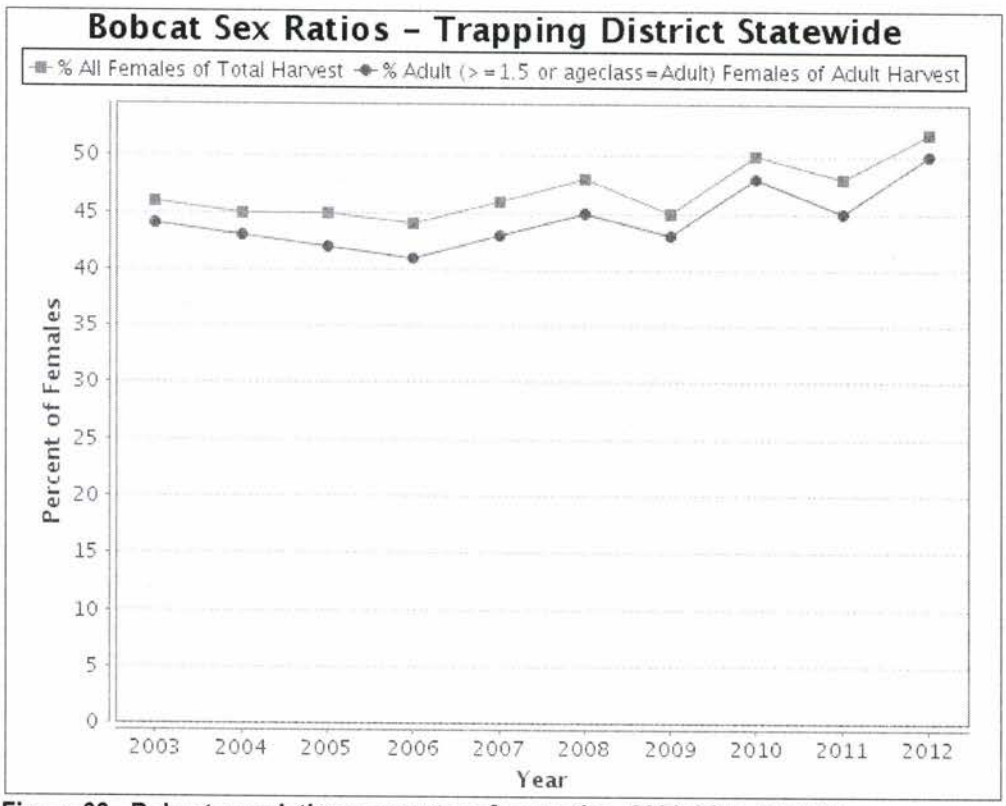

Figure 33. Bobcat population parameter of sex ratios, 2003-04 to 2012-13.

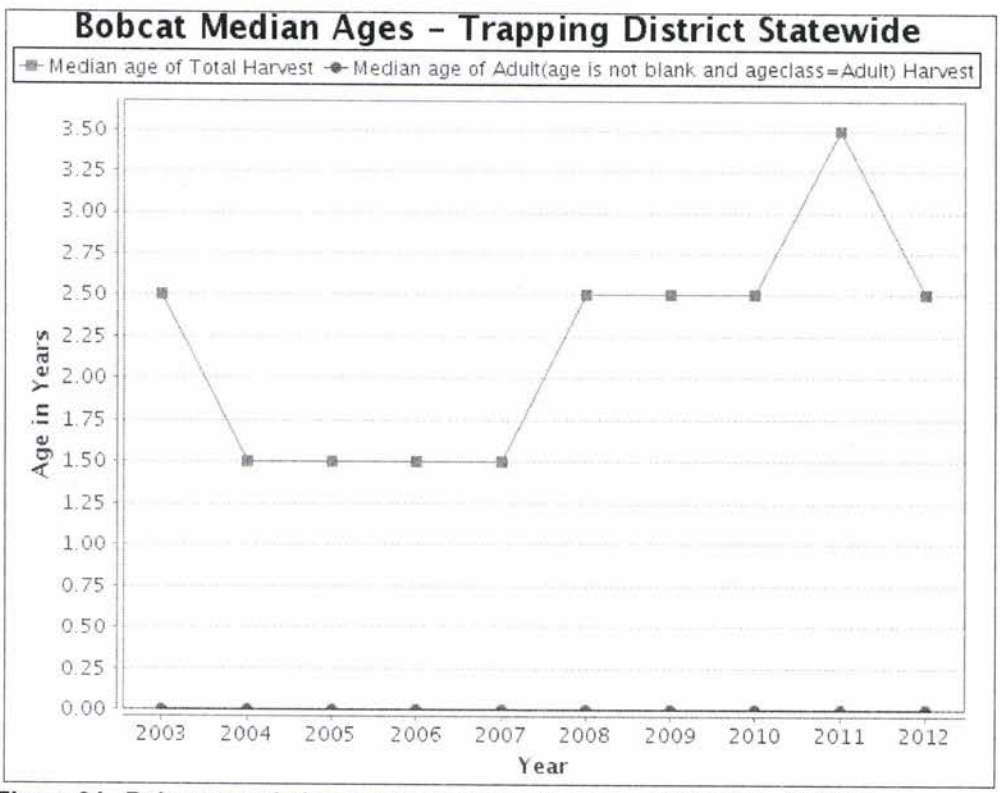

Figure 34. Bobcat population parameter of median ages, 2003-04 to 2012-13.

WEASEL

The statewide weasel harvest continues to remain relatively stable in recent years, although generally at a lower level during the past decade within a range of 200 to 500 animals with some years below this level (Table 13). The majority of weasels taken over most years is in northwestern Montana's TD 1 (Fig. 35). The estimated 2013-14 statewide harvest of 363 animals was slightly above the 10-year average harvest, along with an average pelt price (Table 13). Despite the moderate harvest, average pelt prices offered for 2013-14 were higher than a decade ago.

Examining the trend in CPUE it appears harvest effort has generally increased over the past several years, indicating that more weasels are being taken per unit of effort (Fig.36). Population monitoring activities for weasel are based completely on trapper harvest survey data, with CPUE considered to be an indicator of relative population trend, which could be considered stable, despite the slight decline in 2013-14. The comparison of CPUE for weasel with the other classified predator species is shown in Fig. 49.

Table 13. Weasel harvest, pelt price, and harvest quota if applicable, 1994-95 to 2013-14.

Year	TD 1	TD 2	TD 3	TD 4	TD 5	TD 6	TD 7	State	Pelt Price	Quota
1994-95	286	222	161	109	5	19	0	802	2.66	
1995-96	264	53	24	0	2	0	0	343	1.75	
1996-97	217	16	154	618	8	4	79	1094	1.83	
1997-98	123	54	153	56	0	0	0	386	1.01	
1998-99	144	48	9	42	3	0	0	246		
1999-00	211	86	24	155	0	0	3	480		
2000-01	87	11	19	42	0	0	8	167	1.51	
2001-02	75	7	14	4	0	0	0	100	2.01	
2002-03	248	124	32	0	0	0	0	405	3.01	
2003-04	88	164	51	13	3	0	3	321	3.01	
2004-05									3.01	
2005-06	118	77	9	27	12	0	0	243	3.01	
2006-07	213	161	79	35	12	0	3	503	4.96	
2007-08	185	45	21	12	3	0	0	310	5.69	
2008-09	45	76	6	0	0	0	0	175	4.02	
2009-10	54	24	8	13	0	3	0	121	4.07	
2010-11	164	84	181	13	3	3	3	488	3.13	
2011-12	199	105	15	6	0	15	3	342	3.16	
2012-13	172	70	24	13	3	8	11	301	3.13	
2013-14	131	133	82	7	7	0	2	363	3.20	

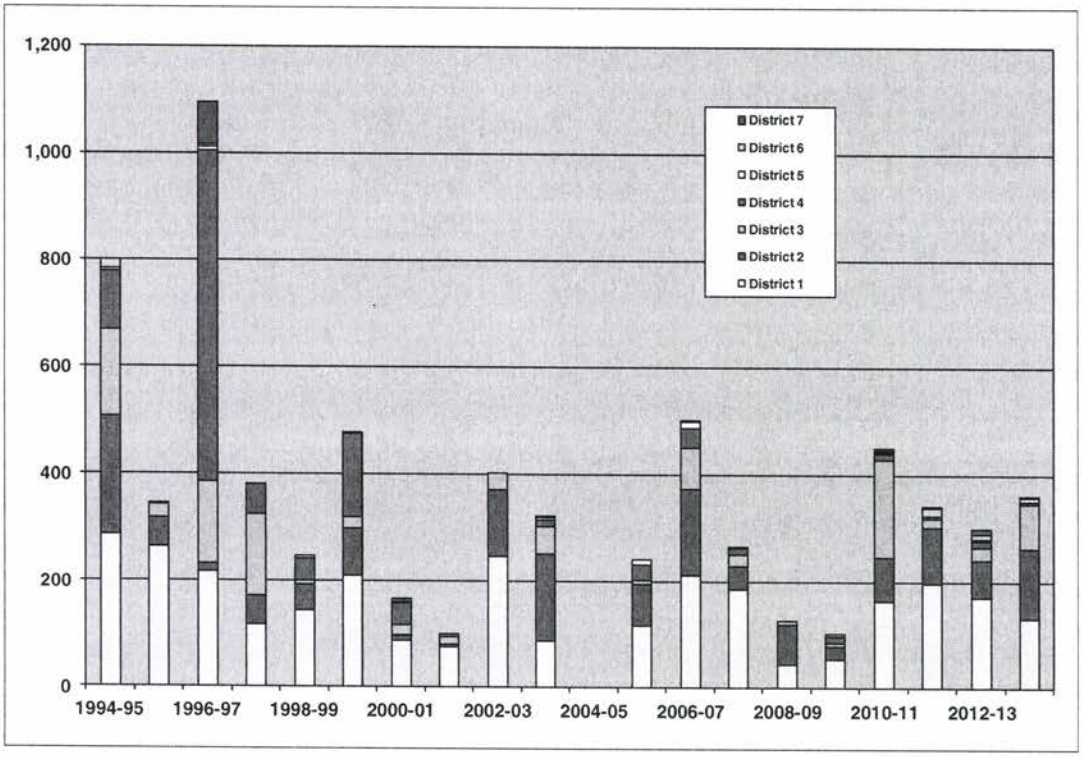

Figure 35. Statewide weasel harvest by trapping district, 1994-95 to 2013-14.

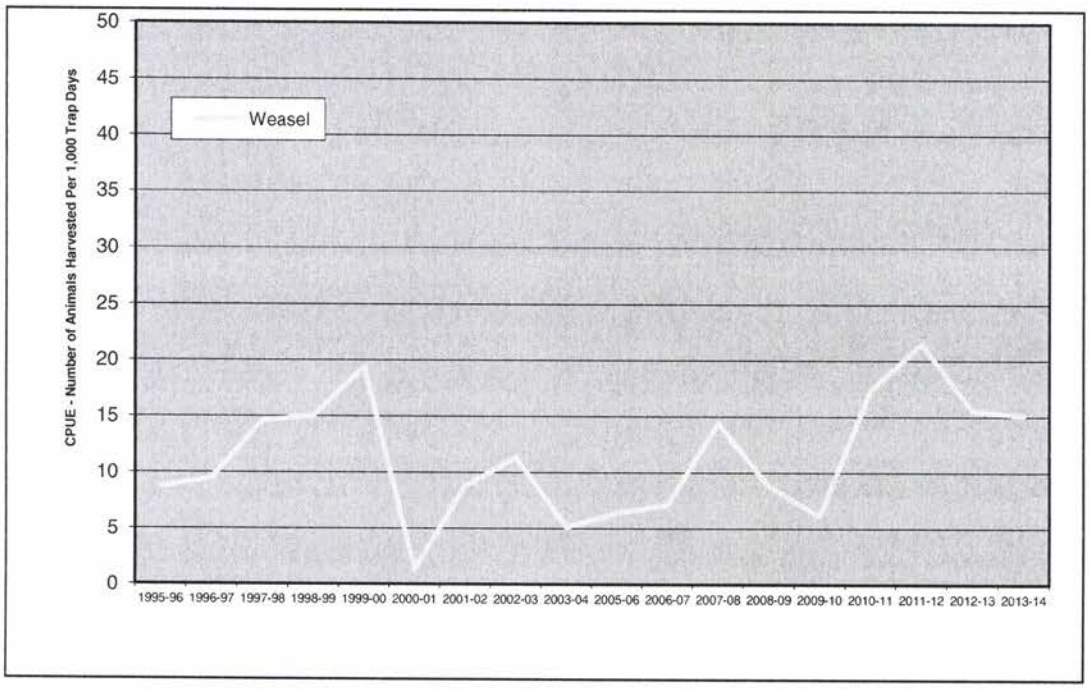

Figure 36. Statewide trend in weasel harvest from CPUE, 1995-96 to 2013-14.

SKUNK

The statewide skunk harvest continues to remain relatively stable, and within a general range of 1,500 to 3,000 animals with some years below or above this level (Table 14). The majority of skunks taken over most years come from the central and southern portions of Montana in TD 4 and TD 5 (Fig. 37). The estimated 2013-14 statewide harvest of 1,554 animals was 34% below the 10-year average harvest, with a slightly below average pelt price (Table 14). A lower harvest than previous years may be a result of the pelt price offered for 2013-14 of $4.26 that was lower than average over the last decade.

Examining the trend in CPUE it appears harvest effort remained about the same as during the previous 2012-13 season, indicating that in 2013-14 a similar number of skunks are being taken per unit of effort (Fig.38). Population monitoring activities for skunk are based completely on trapper harvest survey data, with CPUE considered to be an indicator of relative population trend, which could be considered to be somewhat declining trend over the previous several years. A comparison of CPUE for skunk with the other classified predator species is shown in Fig.49.

Table 14. Skunk harvest, pelt price, and harvest quota if applicable, 1994-95 to 2013-14.

Year	TD 1	TD 2	TD 3	TD 4	TD 5	TD 6	TD 7	State	Pelt Price	Quota
1994-95	69	194	336	222	532	579	1287	3219	3.41	
1995-96	75	198	167	89	401	162	619	1784	6.15	
1996-97	142	169	638	260	705	539	929	3382	3.86	
1997-98	102	138	573	394	445	281	749	2682	2.85	
1998-99	84	246	345	342	306	15	228	1567		
1999-00	7	90	238	780	1015	0	632	2762		
2000-01	72	213	445	175	361	163	141	1570	3.73	
2001-02	46	182	578	442	71	150	146	1616	5.01	
2002-03	40	224	421	248	154	100	235	1422	7.01	
2003-04	167	177	616	397	493	937	210	2996	5.51	
2004-05									7.01	
2005-06	195	145	652	492	252	296	293	2325	6.51	
2006-07	99	187	251	503	477	44	371	1933	4.04	
2007-08	27	209	161	442	152	510	471	2599	5.27	
2008-09	48	113	180	361	643	0	299	1845	4.02	
2009-10	107	53	212	1407	447	27	112	2717	2.34	
2010-11	51	294	267	2567	464	48	113	3975	2.11	
2011-12	32	120	292	140	436	117	597	1735	7.30	
2012-13	115	102	140	244	626	201	2	1711	4.26	
2013-14	152	70	128	419	465	196	123	1554	4.26	

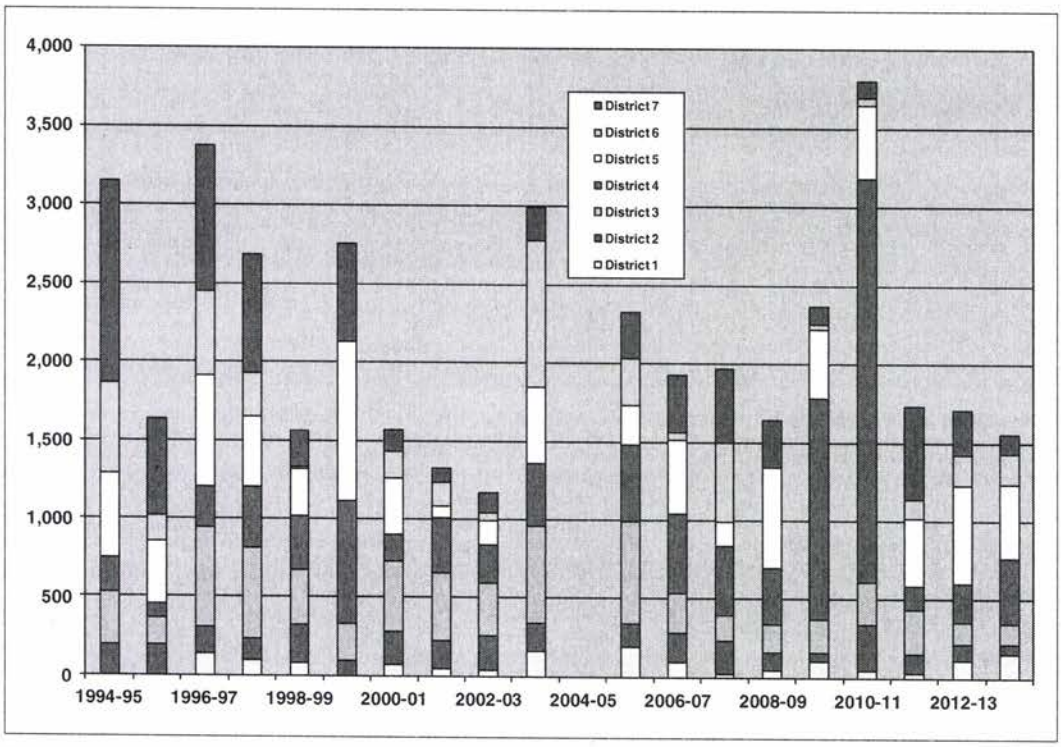

Figure 37. Statewide skunk harvest by trapping district, 1994-95 to 2013-14.

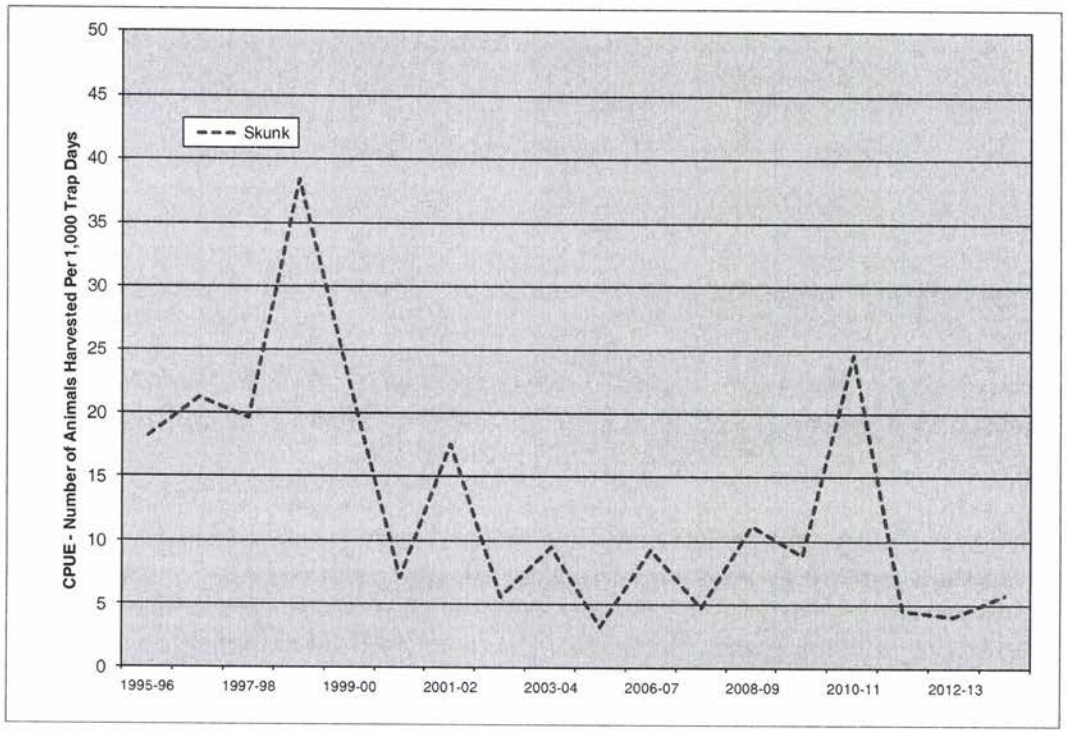

Figure 38. Statewide trend in skunk harvest from CPUE, 1995-96 to 2013-14.

COYOTE

The statewide coyote harvest increased dramatically during the 2011-12 and again in the 2012-13 seasons and remained relative high in 2013-14, from both trapping and hunting (Table 15). The majority of coyotes taken over most years are in the northcentral and eastern Montana TDs 4, 6 and 7 (Fig. 39). The estimated 2013-14 statewide harvest of 15,652 animals was nearly 25% above the 10-year average harvest, along with the second highest average pelt price of $90.67 (Table 15). This average coyote pelt prices offered for 2013-14 was the second highest reported in the past 20 years.

Examining the trend in CPUE it appears that harvest effort has generally remained the same, indicating an increasing coyote population and/or that there is a dramatic increase in the number of successful trappers and hunters during the past several years (Fig. 40). Population monitoring activities for coyote are based completely on trapper harvest survey data, with CPUE considered to be an indicator of relative population trend, which could be considered stable. A comparison of CPUE for coyote with the other classified predator species is shown in Fig. 49.

Table 15. Coyote harvest, pelt price, and harvest quota if applicable, 1994-95 to 2013-14.

1994-95	284	851	1774	2112	1227	788	3034	10079	20.61
1995-96	312	728	991	1216	1197	389	624	5495	19.46
1996-97	189	1193	1594	2953	1445	925	1055	9354	24.68
1997-98	524	1424	2163	2496	1493	821	1588	10510	17.15
1998-99	267	874	1387	1486	688	453	904	6059	
1999-00	514	798	1429	3142	1526	1060	2651	11134	22.06
2000-01	167	593	1483	1836	1563	559	2988	9303	18.93
2001-02	114	745	2086	2211	774	1783	2004	9726	23.71
2002-03	175	971	1452	1357	567	3386	2817	10725	30.71
2003-04	306	1046	2311	3198	1485	1632	2309	12286	28.51
2004-05									30.71
2005-06	278	823	1291	1650	569	2431	2346	9412	38.51
2006-07	433	789	1485	2269	1058	2713	2137	10886	43.36
2007-08	197	546	1200	1716	451	2286	1946	9723	37.91
2008-09	387	437	494	1453	494	827	1780	6969	30.71
2009-10	193	396	544	651	571	153	1112	9048	35.29
2010-11	485	661	464	1764	1135	677	2203	8489	73.16
2011-12	292	605	1243	4660	1834	3487	4276	16398	77.3
2012-13	655	894	1335	3919	2334	5093	5899	20131	93.98
2013-14	583	620	1237	4118	2501	3568	3026	15652	90.67

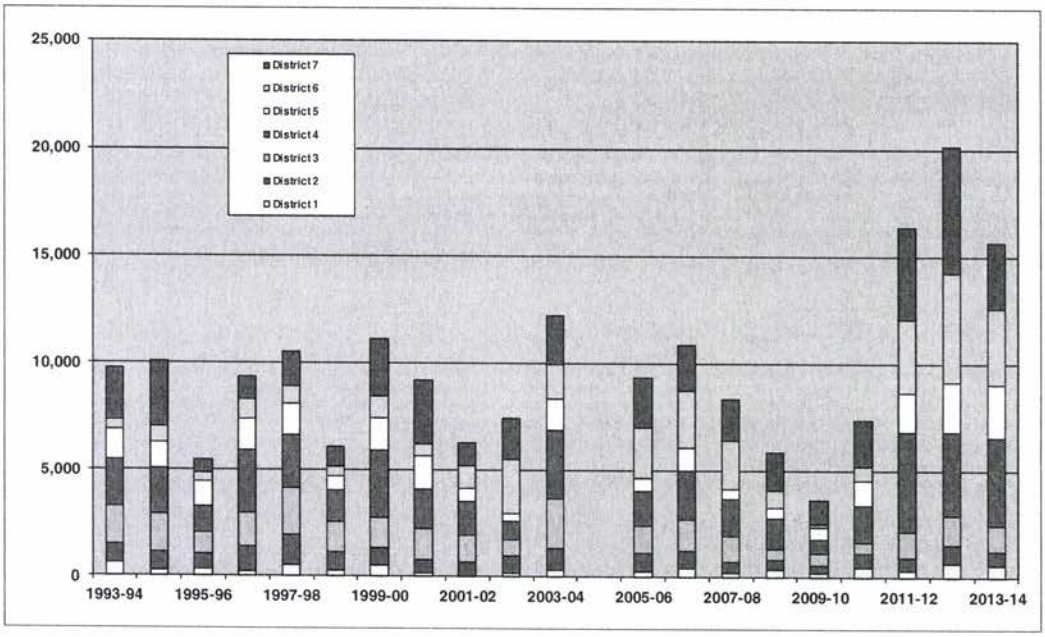

Figure 39. Statewide coyote harvest by trapping district, 1994-95 to 2013-14.

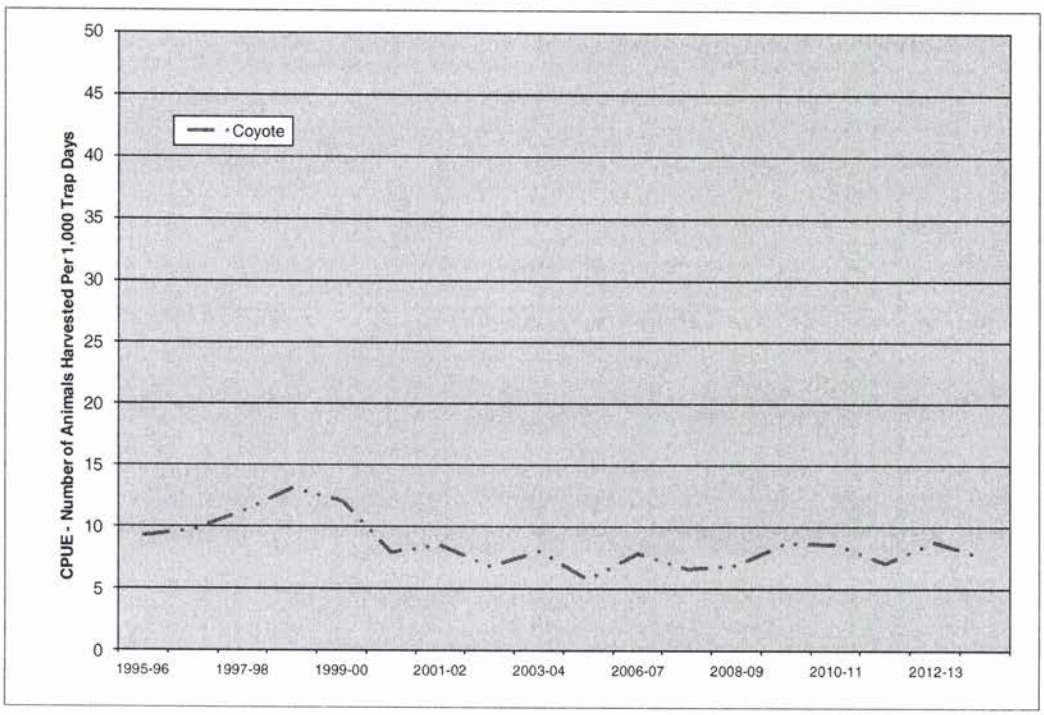

Figure 40. Statewide trend in coyote harvest from CPUE, 1995-96 to 2013-14.

RED FOX

The statewide red fox harvest decreased during the 2013-14 season following a general increasing harvest since 2009-10 after a declining trend in harvest over the prior 15 years (Table 16). The majority of the red fox taken over most years is across all trapping districts except TD 1 (Fig. 41). The estimated 2013-14 statewide harvest of 2,041 animals was 5% below the 10-year average harvest level, despite the higher than average pelt price of $47.29 (Table 16).

Examining the trend in CPUE it appears harvest effort has generally been stable with a decrease during 2011-12 that remained constant in 2012-13 and continued through 2013-14, indicating that fewer fox are being taken per unit of effort (Fig.42). Population monitoring activities for red fox are based completely on trapper harvest survey data, with CPUE considered to be an indicator of relative population trend, which could be considered as having declined. A comparison of CPUE for red fox with the other unclassified nongame species is shown in Fig. 50.

Table 16. Fox harvest, pelt price, and harvest quota if applicable, 1994-95 to 2013-14.

Year	TD 1	TD 2	TD 3	TD 4	TD 5	TD 6	TD 7	State	Pelt Price	Quota
1994-95	19	284	1133	738	2039	691	1963	6872	15.33	
1995-96	73	280	498	411	1267	181	790	3573	18.58	
1996-97	87	402	898	1795	909	677	996	5764	17.74	
1997-98	54	355	1327	795	898	307	1074	4810	12.72	
1998-99	27	210	321	495	438	129	534	2156		
1999-00	10	414	701	842	483	494	684	3629		
2000-01	19	243	521	608	293	270	240	2201	16.24	
2001-02	7	478	770	735	364	435	285	3074	22.65	
2002-03	8	483	523	380	216	364	577	2552	24.01	
2003-04	23	465	434	523	296	68	248	2056	20.01	
2004-05									21.51	
2005-06	38	358	178	509	145	569	670	2473	25.01	
2006-07	55	380	465	409	441	757	655	3164	20.84	
2007-08	45	164	248	266	227	155	277	1862	22.49	
2008-09	20	234	130	367	265	56	299	1695	21.59	
2009-10	16	195	166	80	335	16	129	1471	22.34	
2010-11	113	377	167	162	232	59	156	1418	24.37	
2011-12	29	541	333	328	450	196	591	2469	57.49	
2012-13	223	596	290	309	440	207	771	2837	65.78	
2013-14	157	407	281	436	329	191	240	2041	47.29	

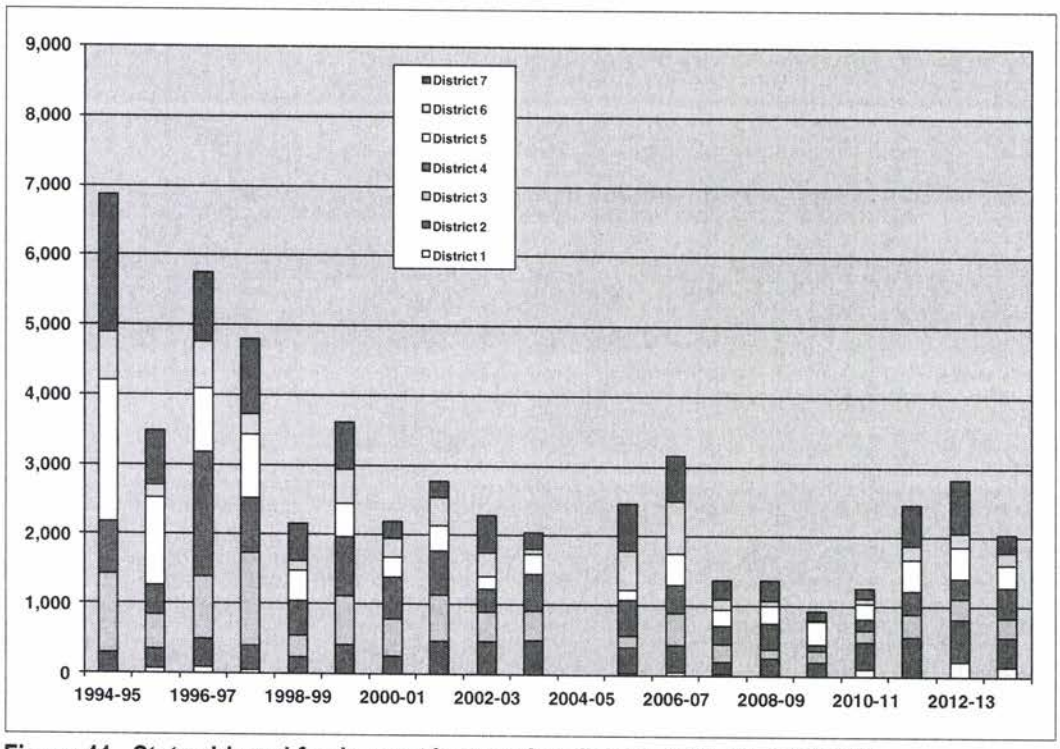

Figure 41. Statewide red fox harvest by trapping district, 1994-95 to 2013-14.

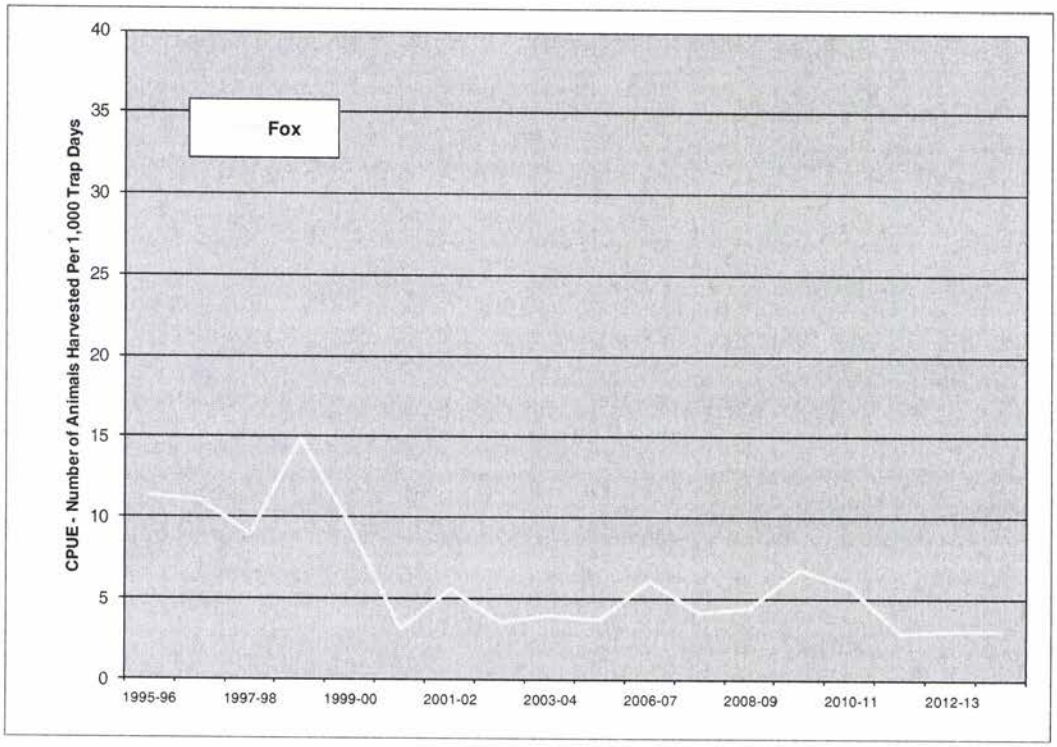

Figure 42. Statewide trend in red fox harvest from CPUE. 1995-96 to 2013-14.

RACCOON

The statewide raccoon harvest had been declining but has increased in recent years, and jumped substantially during the 2011-12 through 2013-14 seasons relative to previous years (Table 17). The majority of raccoon harvested by trapping or hunting over most years has been in southern Montana's TD 3 and 5 and to a lesser degree TD 7 (Fig. 43). The estimated 2013-14 statewide harvest of 6,001 animals is the fifth highest in 20 years and was 18% above the 10-year average harvest. This high harvest was accompanied by an above average pelt price of $21.61 compared to the previous year of $27.56 (Table 17).

Examining the trend in CPUE it appears harvest effort has declined in the past several years, indicating that fewer raccoon are being taken per unit of effort (Fig.44). Population monitoring activities for raccoon are based completely on trapper harvest survey data, with CPUE considered to be an indicator of relative population trend, which could be considered as declining. However, with the higher raccoon harvest levels from 2011-12 through 2013-14 and higher pelt prices, this could be an indication of increased interest in trapping and/or hunting for raccoons. A comparison of CPUE for raccoon with the other unclassified nongame species is shown in Fig. 50.

Table 17. Raccoon harvest, pelt price, and harvest quota if applicable, 1994-95 to 2013-14.

Year	TD 1	TD 2	TD 3	TD 4	TD 5	TD 6	TD 7	State	Pelt Price	Quota
1994-95	64	220	627	520	1724	272	965	4392	9.31	
1995-96	41	111	205	728	2335	471	795	4687	10.97	
1996-97	220	189	1012	1807	3547	976	1465	9216	15.26	
1997-98	61	338	1146	1422	2363	706	921	6956	14.67	
1998-99	144	198	871	736	1855	129	267	4200		
1999-00	69	200	977	908	1661	394	735	4944		
2000-01	11	205	1057	342	2091	281	399	4387	10.02	
2001-02	29	307	1484	485	1337	289	1273	5203	19.31	
2002-03	62	283	939	410	1160	380	1427	4662	11.01	
2003-04	78	258	1008	371	1869	904	1447	5936	11.51	
2004-05									11.01	
2005-06	121	154	1146	524	1125	500	814	4540	11.51	
2006-07	108	240	889	532	1517	266	816	4368	22.05	
2007-08	60	161	421	555	1277	358	651	4506	33.22	
2008-09	39	99	711	717	1343	70	307	4052	17.86	
2009-10	37	155	268	171	1037	145	137	4099	18.02	
2010-11	75	285	359	372	1294	89	218	3201	18.5	
2011-12	73	322	1141	503	2989	380	1000	6409	19.45	
2012-13	83	274	964	588	2557	763	1327	6557	27.56	
2013-14	82	157	680	714	2551	758	58	6001	21.61	

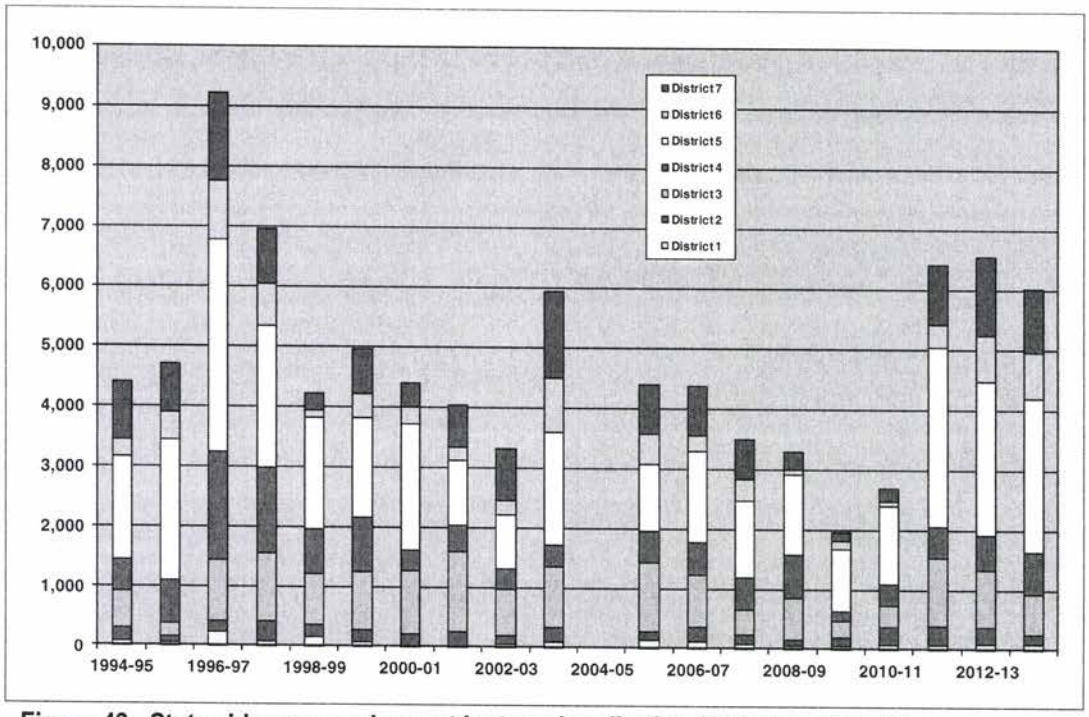

Figure 43. Statewide raccoon harvest by trapping district, 1994-95 to 2013-14.

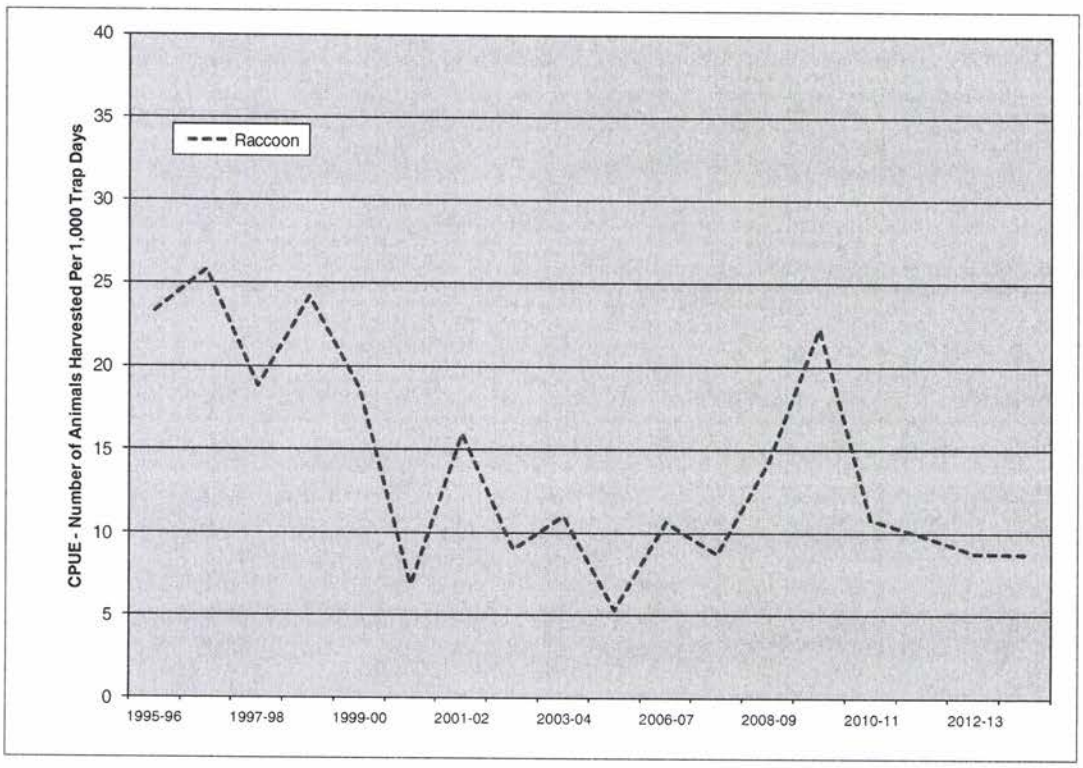

Figure 44. Statewide trend in raccoon harvest from CPUE, 1995-96 to 2013-14.

BADGER

The statewide badger harvest has been relatively inconsistent over the years, with low harvest numbers during several previous years, and then a significant increase beginning with the 2011-12 season and through the 2013-14 season (Table 18). The majority of the badgers taken over most years are in north central and northheastern Montana's TD 4 and 6 (Fig. 45). The estimated 2013-14 statewide harvest of 1,034 animals was 3% below the 10-year average harvest, along with a below average pelt price of $24.38 (Table 18). Several years of higher harvest levels following previous years of below average harvests occurred despite generally lower than average pelt prices. This may indicate badgers are taken opportunistically based on population size.

Examining the trend in CPUE it appears harvest effort has been stable to slightly declining through 2013-14, indicating that a relatively a similar number of badger are being taken per unit of effort (Fig. 46). Population monitoring activities for badger are based completely on trapper harvest survey data, with CPUE considered to be an indicator of relative population trend, which could be considered as stable. A comparison of CPUE for badger with the other unclassified nongame species is shown in Fig. 50.

Table 18. Badger harvest, pelt price, and harvest quota if applicable, 1994-95 to 2013-14.

Year	TD 1	TD 2	TD 3	TD 4	TD 5	TD 6	TD 7	State	Pelt Price	Quota
1994-95	12	17	114	289	26	135	338	931	11.87	
1995-96	2	2	85	280	29	5	85	491	10.01	
1996-97	4	4	102	1260	24	157	268	1819	11.19	
1997-98	0	5	174	563	38	146	146	1071	11.73	
1998-99	0	3	51	87	9	42	69	261		
1999-00	7	3	166	400	21	41	352	991		
2000-01	8	15	114	209	30	84	38	498	15.98	
2001-02	4	4	160	360	57	82	75	742	18.51	
2002-03	13	24	229	378	27	116	224	1012	21.51	
2003-04	8	20	361	765	336	66	232	1788	23.01	
2004-05									23.51	
2005-06	3	39	187	394	122	113	308	1166	27.51	
2006-07	0	32	269	178	190	324	336	1330	27.57	
2007-08	3	27	72	173	54	95	286	871	42.61	
2008-09	0	6	42	51	25	0	169	643	24.81	
2009-10	5	24	5	27	16	27	45	450	72.56	
2010-11	5	48	40	65	48	51	151	609	24.12	
2011-12	3	12	237	714	12	284	213	1474	38.61	
2012-13	29	0	91	497	72	293	309	1292	25.45	
2013-14	17	48	111	581	22	160	94	1034	24.38	

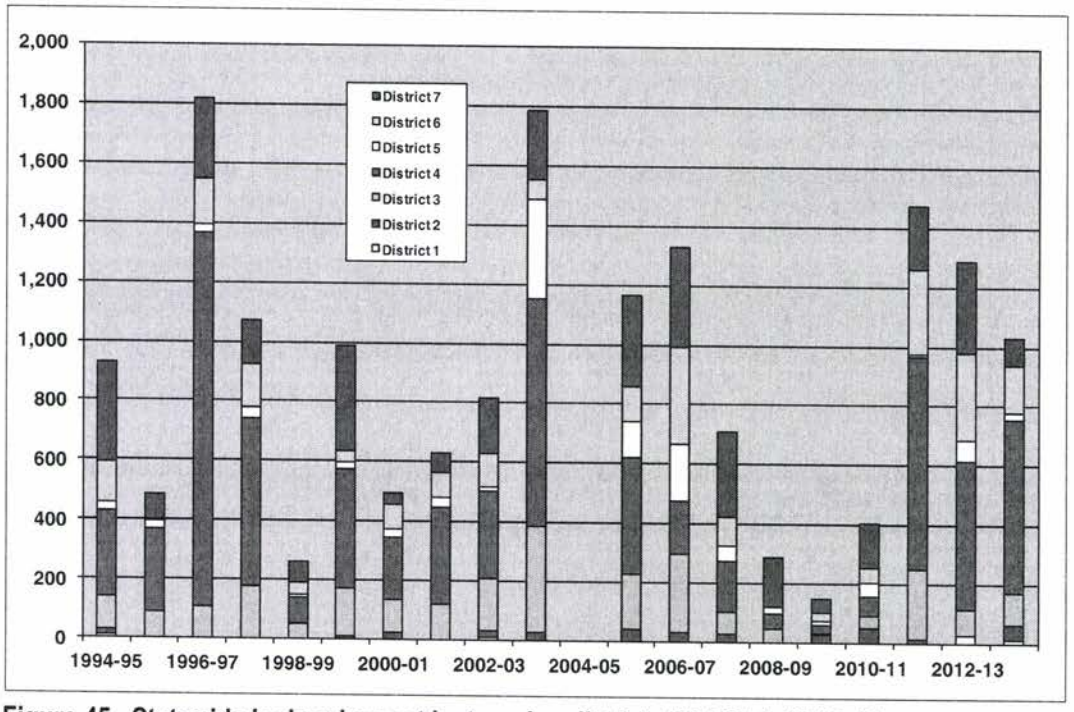

Figure 45. Statewide badger harvest by trapping district, 1994-95 to 2013-14.

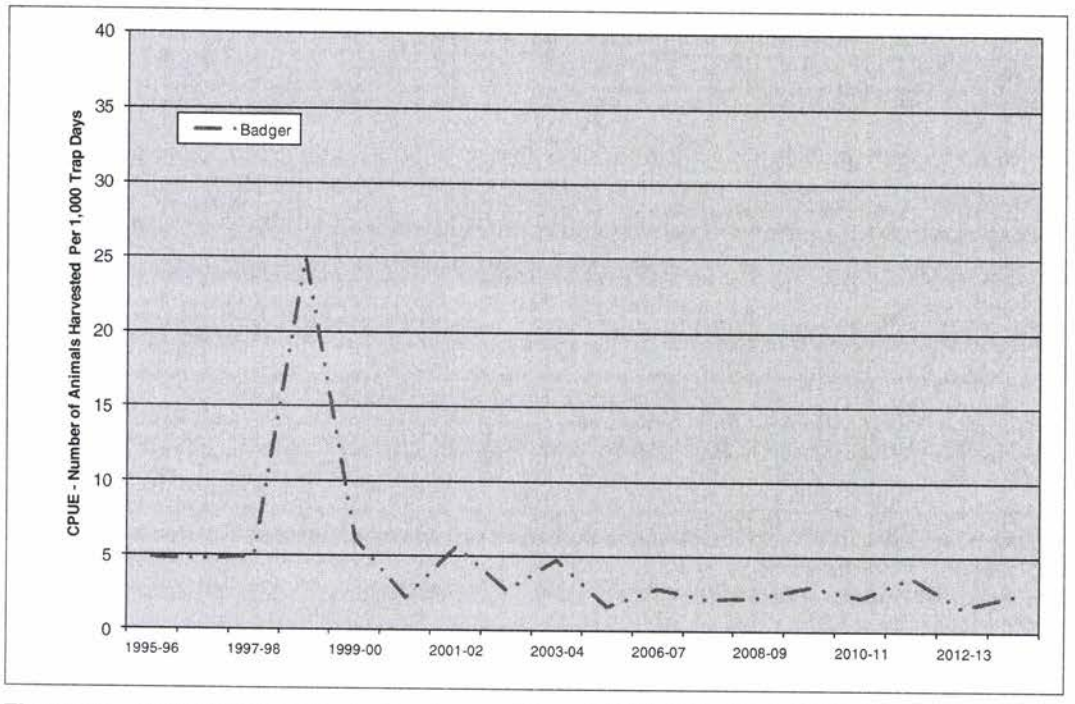

Figure 46. Statewide trend in badger harvest from CPUE, 1995-96 to 2013-14.

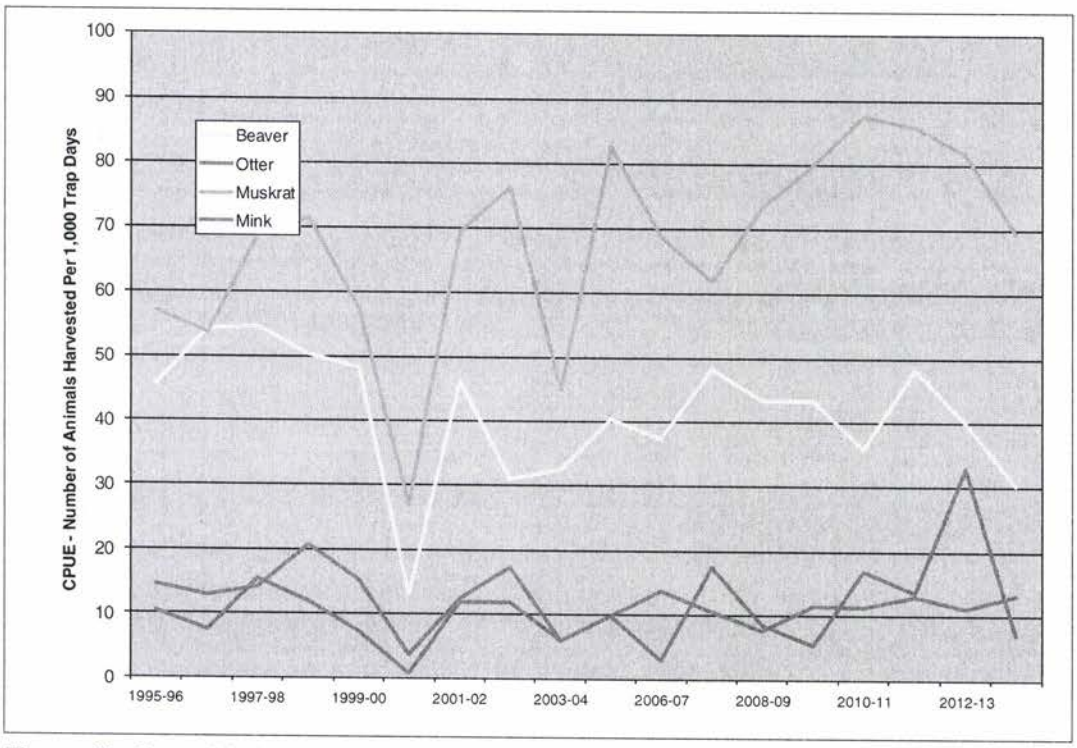

Figure 47. Statewide harvest trend comparison of species group from CPUE, 1995-96 to 2013-14.

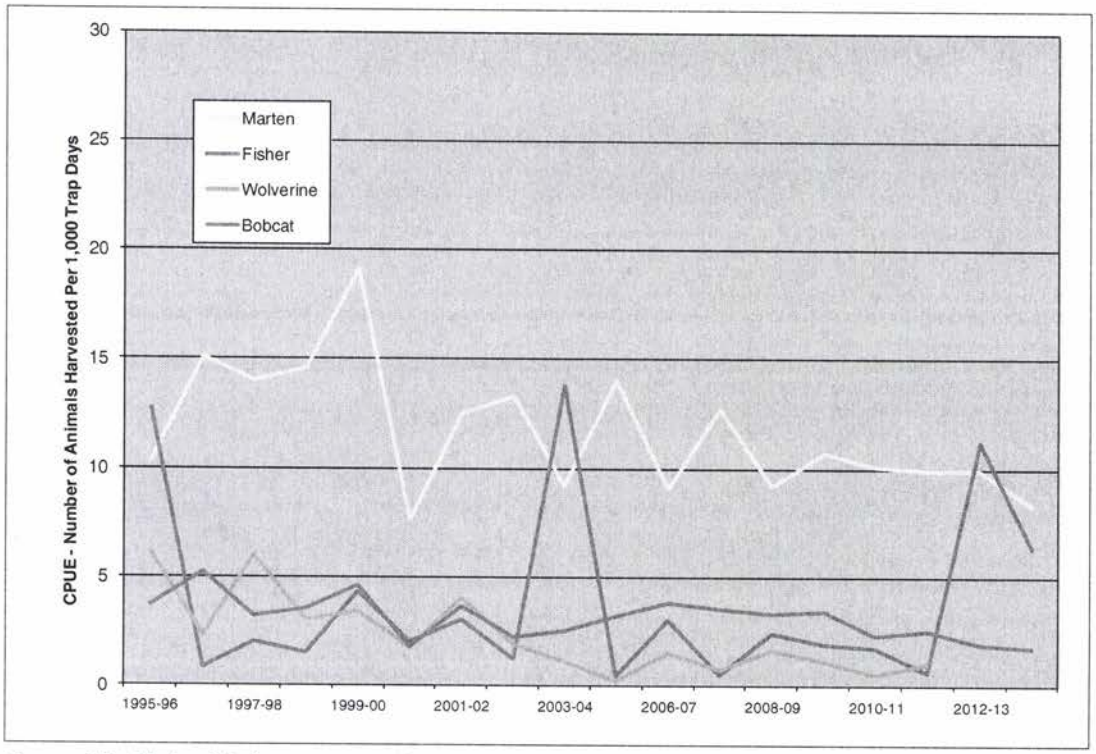

Figure 48. Statewide harvest trend comparison of species group from CPUE, 1995-96 to 2013-14.

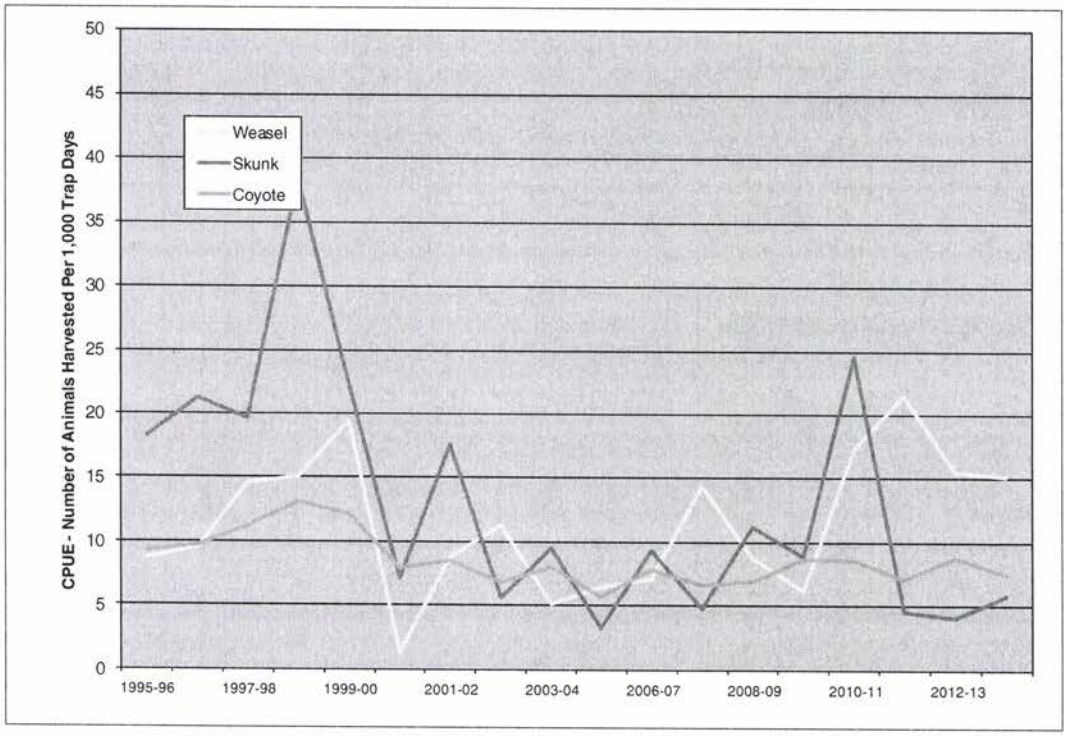

Figure 49. Statewide harvest trend comparison of species group from CPUE, 1995-96 to 2013-14.

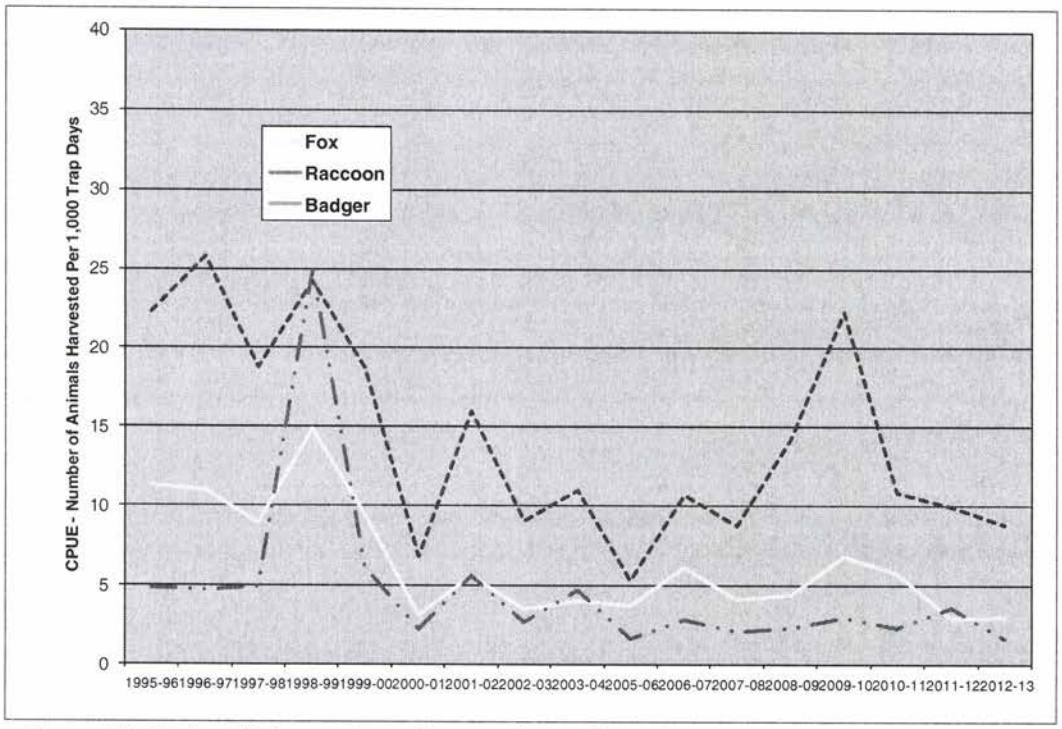

Figure 50. Statewide harvest trend comparison of species group from CPUE, 1995-96 to 2013-14.

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