2010-2011

Oregon Furbearer Program Report

August 2011

Compiled by:

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Note:

Data provided in this report came from various sources, such as historic Oregon Department of Fish and Wildlife (ODFW) Game Division reports, annually collected furbearer harvest and monitoring data, and the Oregon Territorial Council on Furs, Inc. Every effort has been made to present accurate data. Data will be updated and, if necessary, corrected in future reports. Please contact ODFW for suggestions to improve this report.

Please note that data collection methods change over time, so assessment of trends may be more useful than actual values in some instances. Harvest data are generally based on mandatory harvest reporting. Although compliance for reporting has been >95% in recent years, harvest values should be considered estimated minimum harvest in most instances. Data on pelt prices were not corrected for inflation and weighted averages were used for multiple within-year information when necessary.

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On the cover:

A marten visits a bait station as part of a recent monitoring survey on the Wallowa-Whitman National Forest. Photo by Mark Penninger, Wildlife Program Manager.

A rare albino muskrat observed during ODFW waterfowl capture at Summer Lake during fall 2010. Photo by Brandon Reishus.

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Introduction

Many years have passed since a formal comprehensive report has been available through the Oregon Department of Fish and Wildlife (ODFW) on furbearer research and management in Oregon. The purpose of this report is to provide information not only to trappers and hunters, but to all interested in furbearer management in Oregon. This report contains harvest management information, current and recent research and management projects, and monitoring efforts throughout the state, and primarily with ODFW partners.

In an ecological sense, the term furbearer has a somewhat nebulous definition. In practice, this term is commonly meant to describe any mammal that has a pelt with economic value, and generally refers to meso-mammals. In a legal sense, there are often additional classifications and distinctions, or simply species lists, as described below.

By Oregon Administrative Rule (Division 45), adopted by the Oregon Fish and Wildlife Commission, furbearers in the state are currently listed as beavers, bobcats, fishers, marten, mink, muskrats, (river) otters, raccoons, red fox, and gray fox. Unprotected mammals (i.e., those for which there are no closed seasons or bag limits) relevant to this report include badgers, coyotes, nutria, opossums, spotted skunks, striped skunks, and weasels. Oregon Revised Statute 610.002, adopted by the Oregon Legislature, describes predatory animals (relevant to this report) as coyotes and rodents (e.g., beavers, nutria, muskrats) and allows for landowners to implement certain wildlife control practices on privately owned lands. If a trapper or hunter needs clarification on these classification systems, they can refer to the appropriate rule or statute, contact ODFW, or refer to the most recent *Oregon Furbearer Trapping and Hunting Regulations*.

For the purposes of this report, furbearers will include 17 species that may be trapped and hunted: badgers, beavers, bobcats, coyotes, gray fox, marten, mink, muskrats, nutria, opossum, raccoons, red fox, river otters, spotted skunks, striped skunks, and weasels (short-tailed and long-tailed). In addition, this report includes 5 species for which harvest is prohibited in Oregon, but may be considered furbearers in the general sense: fishers, kit fox, ringtails, sea otters, and wolverines.

A fisher cage-trapped near Ashland during 2010 recovers from chemical immobilization after collection of biological data and radio-marking. Photo by Tim Hiller.

Regulatory Highlights

Trapper Education

By action of the 1985 Oregon Legislature, all trappers born after June 30, 1968, and all first-time Oregon trappers are required to complete an approved trapper education course. The course is not required of persons trapping on land owned or leased by that person, the person's immediate family, or a person's agent who is controlling damage to livestock or agricultural crops. The course may be completed at home. Testing will take place at ODFW offices throughout the state. A furtaker's license will be issued by the Salem headquarters ODFW office after the test has been successfully completed and mailed to Salem headquarters. Course materials are available by writing or telephoning Oregon Department of Fish and Wildlife, I&E Division, 3406 Cherry Ave. NE, Salem, OR 97303, (800) 720-6339 extension 76002.

License Requirements

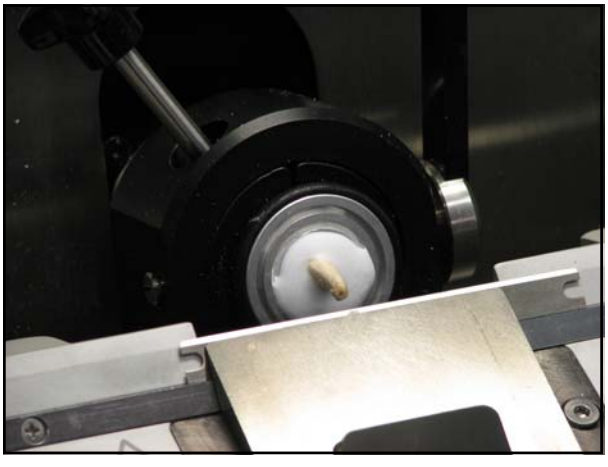
Juveniles younger than 14 years of age are not required to purchase a license, except to hunt or trap bobcats and river otters. They must also register to receive a brand number through the Salem ODFW office. To trap bobcats or river otters, juveniles must complete the Trapper Education course.

Landowners must obtain either a furtaker's license, a hunting license for furbearers, or a free license to take furbearers on land they own and on which they reside. To receive the free license, the landowner must obtain from the Salem ODFW prior to hunting or trapping furbearing mammals on that land.

Mandatory Annual Harvest Reporting

Annual reporting of harvest by all licensed furtakers is required by ODFW for the purposes of monitoring furbearer populations. These data are used with other data sources to help ensure sustainable harvest levels are being achieved. Many of the data provided in this report rely on annual harvest reports submitted by trappers and hunters, making this an integral component to furbearer management.

Historically, persons who were licensed, but did not fill out and return a completed furtaker harvest report form postmarked by April 15 (following the most recent season), would not be issued a furbearer harvest license for the following season. However, a new Oregon Administrative Rule (635-050-0045) now allows for these non-compliant licensed furtakers to complete and submit a late report and pay a fee to allow for them to purchase a furbearer harvest license for the following season.



Many mammalian teeth are collected to age individuals. After processing, staining, and sectioning teeth, experienced lab personnel can count cementum annuli layers similar to growth rings in a tree. Photo by Tim Hiller.

Badger (*Taxidea taxus*)

Four subspecies of badgers exist in North America, with Oregon and much of the western U.S. and Canada having *T. t. jeffersonii*. Their geographic distribution includes from the southern Canadian provinces south well into Mexico and from the Pacific coast east through the Midwestern states, though badgers may be expanding their range eastward. Badgers are rarely seen and have likely always existed at relatively low densities. In northern latitudes and at high elevations, badgers may undergo torpor, but not true hibernation. Prey items generally are composed of small mammals such as gophers and ground squirrels, but badgers prey upon many other species as opportunities arise. The digging activities of badgers are often obvious, and may cause damage to agricultural operations in some instances. However, a fresh badger hole is certainly not a guarantee that a badger is in the immediate area, as they often move over large areas.

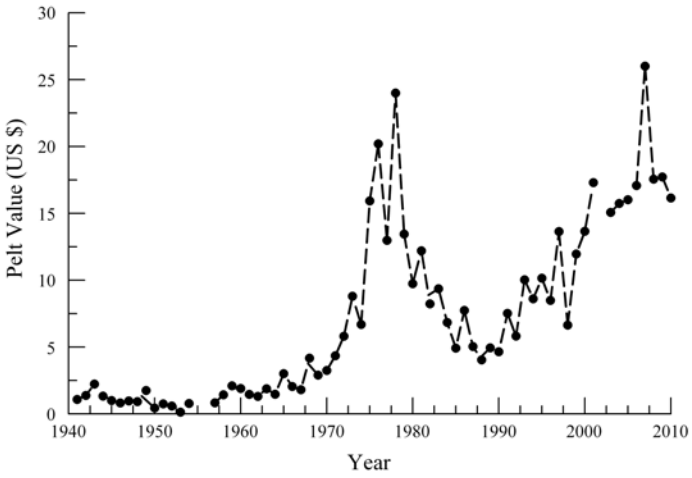
Badger Research

Although there have been relatively few research projects conducted on badgers, ODFW is working with the University of Wisconsin-Milwaukee on a range-wide project to assess phylogenetic relationships among subspecies of badgers. Trappers and hunters will play a key role in supplying samples for this research project. Please contact Tim Hiller, ODFW Carnivore-Furbearer Coordinator, for more information or to participate in this study.

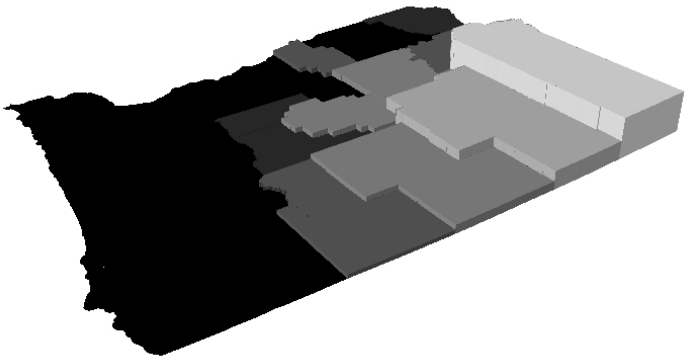
Harvest

Badgers can be both trapped and hunted in Oregon. Harvest for the 2010-2011 season was slightly higher for trappers (188) than hunters (121), with probably the majority of each taking badgers incidentally to other furbearing species. Eastern Oregon is typically where most badgers are harvested, with very few taken west of the Cascade Range.

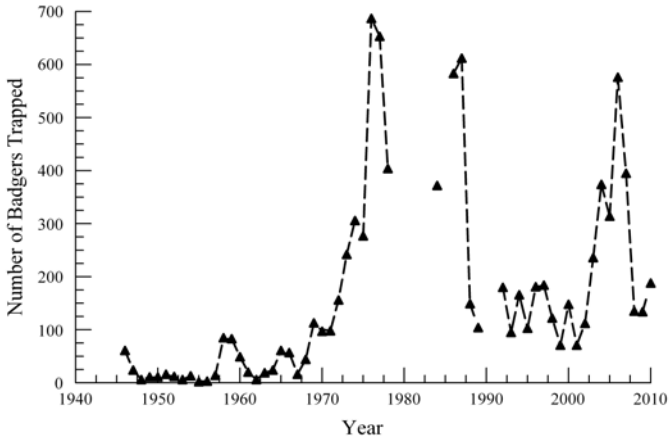
Annual pelt values of badgers during 1941-2010. Values are not corrected for inflation.



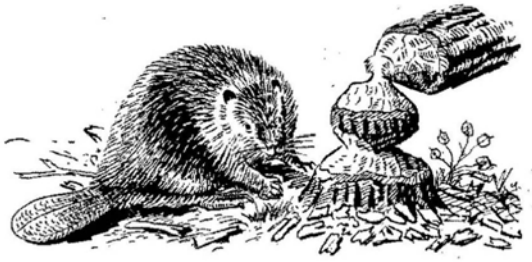
Relative number of badgers taken by trappers in Oregon during the 2010-2011 season.



Annual harvest of badgers by trappers in Oregon during 1946-2010.



Beaver (*Castor canadensis*)



Beavers are important part of history in North America, particularly in the Pacific Northwest. Many of the first Europeans in this area were trappers pursuing beavers and trading with the Hudson Bay Company. Unregulated harvest contributed to population declines for beavers, and as state wildlife agencies gained management control over fish and wildlife species, beavers were one of several species that became protected. Oregon has a rich history of relocating beavers in past decades in an attempt to increase their abundance and distribution. As populations increased, however, so did property damage. Beavers are currently a common species in Oregon and throughout North America. Trapping seasons exist in most states, including Oregon. States that do not allow trapping of beavers, such as Massachusetts, have experienced high levels of damage and economic loss from beaver activities.

Beavers are one of the most influential wildlife species when it comes to modifying ecosystems. Dam-building activities by beaver colonies create wetlands beneficial to many other species. However, as with most natural processes, dams are not permanent. As habitat conditions change, beavers may move to new areas to continue their activities. Not all beavers build dams, and many do not build lodges (but instead dig bank dens), so presence of beavers in a given area may not be immediately obvious. Unfortunately, these vegetarian rodents have even been introduced to several other continents where their activities cause ecological damage as an invasive species. A classic example of this is in Tierra del Fuego, the southern-most tip of South America, where eradication attempts are underway to reduce ecological damage and prevent their spread northward.

ODFW Beaver Work Group

Because beavers are important ecological engineers, ODFW formed the Beaver Work Group in 2007 to help guide beaver management in Oregon. The mission of the Beaver Work Group is to identify research and information gaps to help improve our understanding of beaver ecology and beaver management so that we can maximize the ecological benefits that beaver provide, especially for federally listed coastal coho, and minimize any negative impacts. The work is done within the guidelines of existing rules and statutes. Members of this group include ODFW biologists and external stakeholders from academic institutions, other state and federal agencies, trapping organizations, landowners, and others. This group recently completed the Guidelines for Relocation of Beavers in Oregon (see http://www.dfw.state.or.us/wildlife/living_with/beaver.asp), which readers can refer to for more information.

History of Beaver Relocation Efforts in Oregon

Oregon's first beaver relocation program began in 1932 as a joint effort by the U.S. Forest Service, Bureau of Biological Survey, and the State Game Commission. Trappers were hired and a total of 962 beavers were relocated during the 6 years that the program was in effect. With funds from the 1938 Federal Wildlife Restoration Act, over 3000 beavers were relocated across the state by 1951. These beavers were primarily nuisance individuals removed from agricultural lands, although an effort was made to relocate tidal-zone beavers from the lower Columbia, as this sub-species (*C. c. idoneus*) was considered to have high fur quality. The combination of habitat improvement programs, streamside surveys, and several large fires and logging operations had greatly improved beaver habitat in the Coast Range, which probably increased the success of the beaver relocation efforts. By 1951, all suitable habitat was considered occupied by beavers and the relocation program ended.

Live-capture of beavers can be accomplished by experienced trappers using appropriate cage-traps or snares. Photo by the Internet Center for Wildlife Damage Management.

(*continued on next page*)

Beaver (*continued*)

History of Beaver Relocation Efforts in Oregon (*continued*)

From 1945 to 1950, the State Game Commission entered into cooperative beaver management agreements with private landowners, with as many as 1,500 agreements signed. The State Game Commission hired trappers to remove excess or nuisance beavers during the winter months when pelts were prime, and the revenue was split 3 ways by the landowners, Game Commission, and the trappers. Even with 6,000 beavers removed per year by the hired trappers, nuisance complaints persisted. As a result, the State Game Commission once again opened the state to beaver trapping for the public in 1951. Trappers were required to purchase metal pelt seals for $2 each and were limited to 200 per trapper per season. The price of seals was later reduced to $1, with a limit of 100 beavers harvested between November 15 and March 15. With low demand for beaver pelts during the 1960s and 1970s (and a corresponding increase in beaver nuisance complaints), by the 1978–9 season, regulations changed to eliminate the metal seal and bag limit requirements.

Survey of Landowner Attitudes toward Beavers

Drs. Mark Needham and Anita Morzillo at Oregon State University recently completed a social survey about beaver management. Objectives were to evaluate: (1) landowner attitudes and tolerance limits toward beavers and their habitat, and (2) the extent that incentives (e.g., reimbursements, expert site visits, technical assistance, equipment and labor, information and education) could be used in the future to encourage coexistence between beavers and humans. This project began with a literature review of studies examining human dimensions of beavers and holding focus groups. Two focus groups were held in Portland and Newport, with participants representing a range of agencies and interest groups. Information collected from the literature review and focus groups was used to inform the development and design of a survey to be distributed to residents across Oregon. Questionnaires were administered to a random sample of residents living in four regions (East, Coast, Portland, and Southwest) in Oregon.

Survey results have very recently become available. In summary, most respondents have seen beavers in the wild, and were very knowledgeable about beavers. In total, 20% of respondents have experienced impacts by beavers, with greater percentage in the East and Coast regions. Many respondents indicated that they would like more information about beavers, particularly on how to coexist with beavers, mechanisms for preventing impacts, and mitigating impacts. The majority of respondents were interested in both seeing (65%) and having (57%) beavers on their property or neighboring properties, especially in the Coast region. In addition, respondents had more positive than negative attitudes toward and beliefs about beavers. However, large proportions of respondents, particularly in the Portland area, were also concerned about the spread of disease by beavers and health or safety of pets, children, and themselves due to beavers.

Additional results suggest that if beavers cause impacts on their own property or neighboring properties, respondents believed that doing nothing and leaving beavers alone were unacceptable, yet lethal control of beavers and trying to frighten beavers away were perceived as unacceptable responses as well. The greatest proportion of landowners (84%) believed that state agencies should be responsible for addressing problems with wildlife such as beavers on private property. It should be noted that regional differences existed in landowner responses. These differences, and further details from analysis, are available in the project final report on the ODFW web site (http://www.dfw.state.or.us/wildlife/living_with/beaver.asp).

Beaver (*continued*)

Beaver Relocation Study in Coastal Oregon

Dr. Jimmy Taylor (National Wildlife Research Center), Dr. Dana Sanchez (Oregon State University), and Vanessa Petro (Oregon State University) are currently starting a research project to assess survival, space use, and fates of relocated beavers in a coastal Oregon watershed. In the Pacific Northwest, beaver dam impoundments may provide areas of refuge for fish that would normally be absent. Coastal coho salmon (*Oncorhynchus kisutch*) are particularly aided by beaver dams as young salmon experience higher growth rates and higher abundance in beaver-created habitat than in pools created by other fluvial processes. The decline in Pacific salmon populations has prompted efforts to identify factors affecting fish survival.

ODFW recently published guidelines for relocation of beaver in Oregon; however, the effects of relocation are unknown. One challenge in designing a beaver relocation plan is to identify appropriate release sites that will maximize the probability of achieving the project goals (i.e., increased dams and in-stream habitat for salmon). Most published literature generally reported low survival and long-distance movements by released beavers.

Data are lacking on basic ecology, movements, and dispersal of beavers throughout the Coast Range of Oregon. This study will use existing models that predict potential beaver dam-site locations based on geomorphic attributes and identify stream reaches of high intrinsic potential for coho in the Alsea Watershed of coastal Oregon. Model outputs will be used to select optimal sites where increased beaver dams should increase coho population growth. Furthermore, this study will be designed to determine relationships between floral composition, stream geomorphology, and habitat use of beavers in coastal Oregon; relationships between movement, survival, and cues that cause a settling response in beavers relocated into coastal Oregon; and model changes in coho smolt production based on predicted and realized increases in dam activity as a result of beaver relocation into coastal Oregon. Results of this study will aid wildlife and land managers in the development of management plans and practices which include beavers as a restoration tool in coastal Oregon, and will provide information to aid ODFW in implementing or modifying beaver relocation guidelines.

Beaver Relocation Study in Eastern Oregon

Dr. Jimmy Taylor (NWRC) and Julie Maenhout (OSU) are currently starting a research project to assess survival, space use, and fates of relocated beavers in Bridge Creek in Wheeler County. This stream has experienced historical beaver trapping, cattle grazing, and has historically been used by anadromous steelhead (*Oncorhynchus mykiss*), which are listed under the Federal Endangered Species Act. Restoration efforts are already underway at Bridge Creek to restore in-stream fish habitat and riparian area diversity and productivity. Because land and fishery managers are interested in using beavers as a restoration tool, it is important to understand whether beavers can successfully be relocated into areas where populations are lacking. However, there is little information about beavers in semi-arid environments, including the extant beaver populations on Bridge Creek.

A study in the Long Creek basin in eastern Oregon found that a low stream gradient, gentle bank slope, fine substrate type, and higher hardwood cover are the best indicators of dam-site habitat for beavers. Similar models also included stream width, stream depth, and diameter of trees in areas with signs of active beaver colonies. Numbers of beaver dams found on Bridge Creek fluctuated between 0.6 to 6.5 dams per mile over a recent 17-year study, much less than the average of 16 dams per mile on typical low-gradient streams. Washed out dams were not immediately rebuilt after yearly high flow events in the spring and early summer on Bridge Creek, suggesting that dams may be a poor indication of habitat selection for beavers in this semi-arid region. To better understand habitat requirements by beavers in Bridge Creek and how they allocate resources and time, researchers propose to test if beavers are using habitat in proportion to availability at multiple spatial scales. They hypothesize that den sites as a function of channel geomorphology and water depth are a limiting factor rather than food or construction material. Furthermore, they hypothesize that seasonal changes in water levels along Bridge Creek cause beavers to use multiple core areas to increase survival. Fine-scale observations of beaver behavior through radio telemetry will yield survival rates, causes of mortality, and will provide additional information on number of dams attempted and number of dams that persist.

Beaver (*continued*)

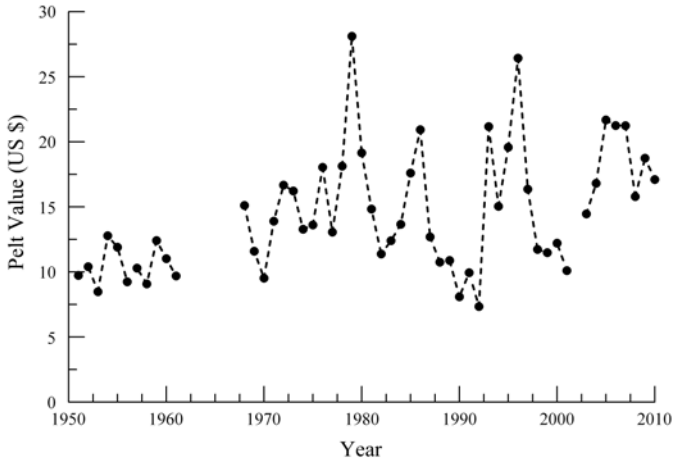
Harvest

High demand for beaver pelts and unregulated harvest brought Oregon's beaver population to critically low numbers in the first half of the 19th Century. By 1893, the Oregon State Legislature, acting upon range and timber land managers' concerns, closed Baker and Malheur counties in eastern Oregon to beaver trapping. By 1899, the Legislature closed the entire state to beaver trapping. This closure remained in effect until 1917–18, when the closure was lifted for Benton and Marion counties to allow year-round take of nuisance beavers. By 1923, the entire state was opened to beaver trapping from November through February except for National Forests and 5 southwest Oregon counties. Eight years later, in 1931, the legislature once again closed beaver trapping statewide with the exceptions of Clatsop, Columbia, Multnomah, Marion and western Douglas counties. However, these counties were again closed to harvest the next year. In 1937, the Legislature delegated beaver as a responsibility of the State Game Commission (now ODFW) to respond to nuisance complaints and all recreational trapping was closed.

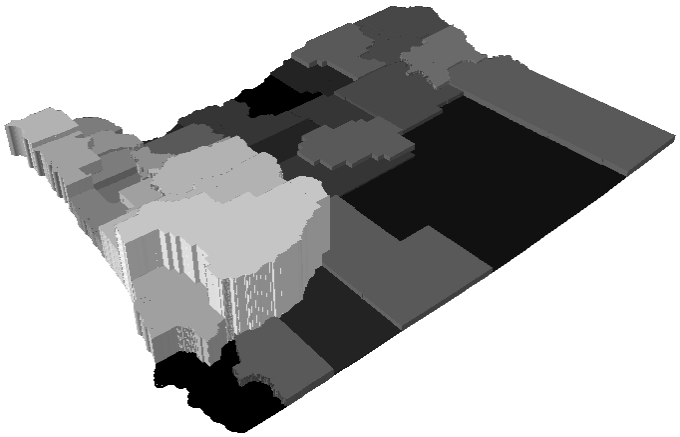
Annual harvest of beavers has steadily decreased since 1950, although beavers taken for damage control are not included in estimates. Beaver populations in Oregon are considered to be very healthy, with removals related to damage occurring throughout much of the state. During the 2010-2011 trapping season, a minimum estimate of 3,200 beavers were harvested. Eighty-five percent of the harvest was west of the peak of the Cascades. Douglas County led the state with a minimum harvest of 480 beavers.

Pelt values for beavers has historically shown large fluctuations, with a high of about $28 in 1979 and a low of about $7 in 1992. The 2010-2011 season average was about $17.

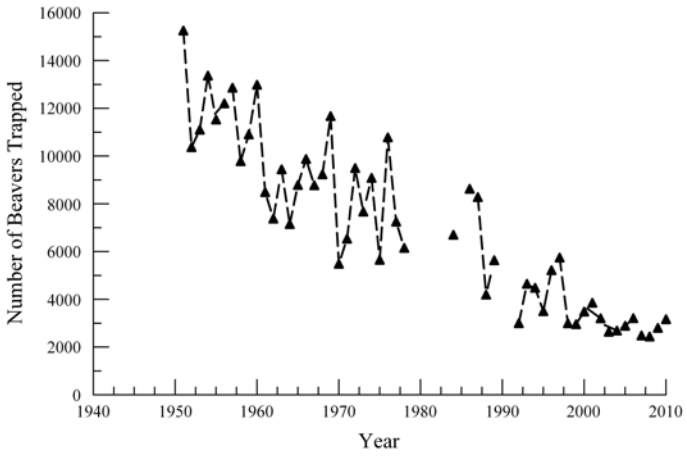
Annual pelt values of beavers during 1951-2010. Values are not corrected for inflation.



Relative number of beavers taken by trappers in Oregon during the 2010-2011 season.



Annual harvest of beavers by trappers in Oregon during 1951-2010.



Bobcat (*Lynx rufus*)

Bobcats are distributed throughout the contiguous United States, southern Canada, and much of Mexico. Bobcat populations are estimated to have increased since the late 1990s, with a U.S. population between 2.4 and 3.6 million individuals. There are 2 subspecies of bobcats in Oregon: *L. r. fasciatus* generally west of the peak of the Cascade Range and *L. r. pallescens* generally east of the peak of the Cascade Range. Western Oregon bobcats typically have a darker-colored pelt with relatively few spots, whereas eastern Oregon bobcats have pale, spotted pelts; the pelts of the latter have a value of 3-4 times more at fur sales than those of the former. Harvest management zones for bobcats in Oregon is based on subspecific geographic distribution, with counties west of the peak of the Cascades currently having no harvest limit and counties east of the peak of the Cascades having a harvest limit of 5 bobcats per licensed individual (in aggregate whether harvested by hunting or trapping). Eastern Oregon had been closed to harvest of bobcats in 1977 and re-opened for the 1979-1980 season.

Collection of Biological Data

Under the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), bobcats were listed in Appendix II in 1977 as "look-alike species," probably in reference to certain endangered species of lynx. That same year, ODFW classified bobcats as furbearers. Removal of bobcats from CITES Appendix II has been attempted for many years, as biological data do not support its inclusion. To meet requirements of CITES, Oregon (and other states) implemented a program that requires all harvested bobcats to be tagged. In Oregon, biological data are collected at the time of tagging, such as sex and location of harvest, and hunters and trappers are required to submit the lower jaw of each harvested bobcat for aging purposes. Determining the sex and age of harvested bobcats allows for annual trends to be examined to ensure that regulations permit sustainable harvest. Many states collect carcasses of harvested bobcats for additional biological data; ODFW did this starting in 1980, but discontinued at some point afterwards.

Population Genetics of Bobcats in Oregon

Dawn Reding and Dr. Bill Clark at Iowa State University used bobcat tissue samples supplied by ODFW to determine whether bobcats in Oregon are subdivided into genetically discernible populations that support the subspecies classification and management regulations. The analyses were based on tissue samples from 250 mandibles of bobcats harvested during the 2009–2010 season. Results indicated strongest support for the presence of two genetic populations, generally corresponding to the two subspecies, and weak but significant structure between the east and west regions. Although significant structure was detected, the degree of genetic differentiation was surprisingly low given the taxonomic distinction of two subspecies in the state. Individuals on either side of the Cascades often shared the same mtDNA sequence. In addition, these researchers identified 21 putative migrants, individuals with genotypes more likely to have originated from the opposite side of the Cascades. Thus, the Cascade Range likely does not function as an absolute barrier to gene flow in bobcats. However, the subspecific designations generally reflect the actual population structure of Oregon's bobcats (i.e., two populations separated by the Cascade Range), supporting current regulatory differences between the 2 regions.

Bobcat (*continued*)

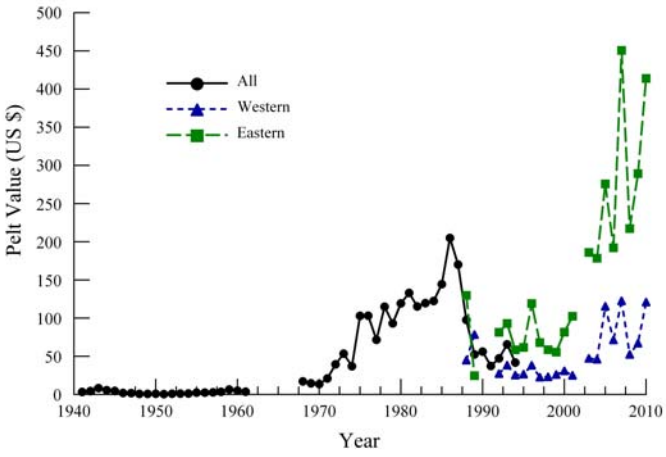
Bobcat at a bait station on a wolverine detection study in northeastern Oregon. Photo by Audrey Magoun.

Harvest

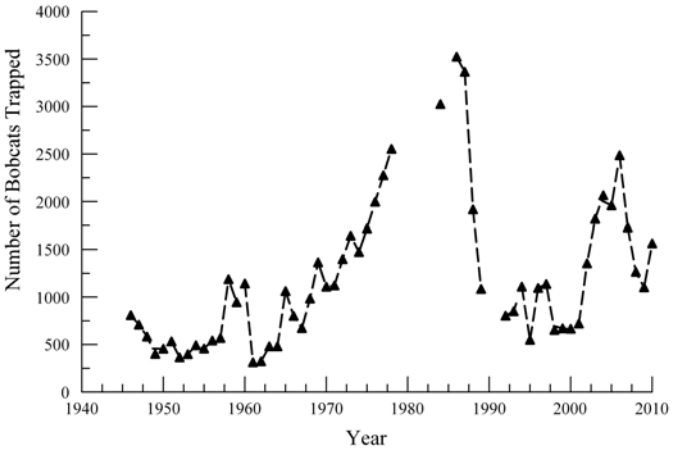
During the 2010-2011 season, trappers harvested a minimum of 1,564 bobcats statewide, whereas hunters harvested a minimum of 1,487 bobcats statewide. In western Oregon, Douglas County had the highest harvest of bobcats by both trappers (148) and hunters (167). In eastern Oregon, Lake County had the highest harvest by trappers and hunters, with 248 and 116 bobcats taken, respectively.

Pelt values for bobcats are strongly differentiated between western and eastern Oregon. In recent years, pelt values for each subspecies, particularly the eastern subspecies, has shown large fluctuations. Values (not corrected for inflation) for eastern-Oregon-type bobcats are currently much higher (average = $450) than during the fur boom of the 1970s and 1980s (e.g., 1986 = $205 for all bobcats).

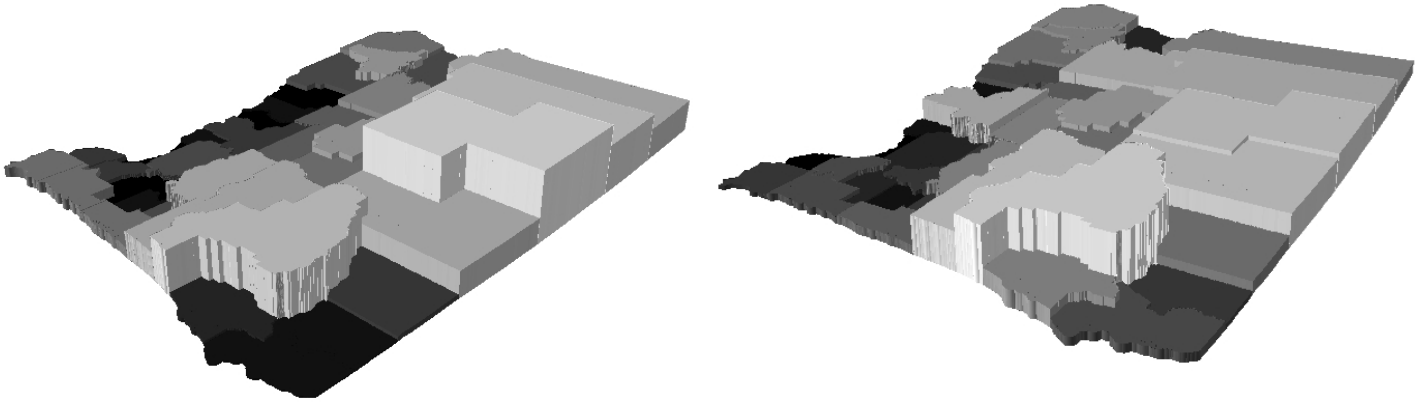
Annual pelt values of bobcats during 1941-2010. Values are not corrected for inflation.



Annual harvest of bobcats by trappers in Oregon during 1946-2010.



Relative number of bobcats taken by trappers (left) and hunters (right) in Oregon during the 2010-2011 season.



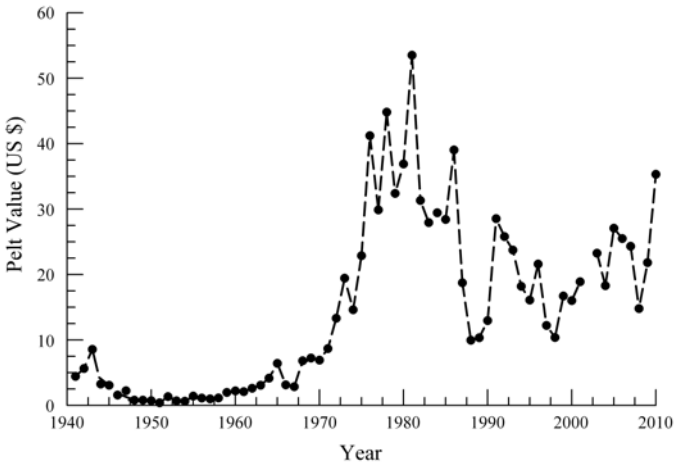
Coyote (*Canis latrans*)

Coyotes are one of the most familiar wildlife species to Oregonians. Coyote populations have increased substantially in both abundance and distribution during the past several decades, and populations now exist in most large metropolitan areas, including Portland. An ongoing 10-year study in Chicago revealed that very few residents have experienced problems with urban coyotes, and very few even knew that coyotes lived in their neighborhood. In rural settings, however, localized damage to livestock operations may occur in spring and summer during parturition and soon thereafter for sheep, goats, and cattle. However, determining if coyotes depredated livestock or simply scavenged on already dead livestock may be difficult even for trained individuals.

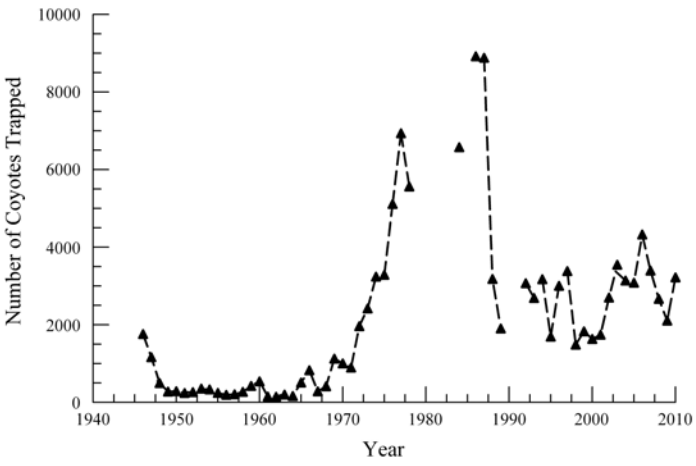
Harvest

The fur boom during the 1970s and 1980s resulted in the highest harvest levels of coyotes since the 1940s. By Oregon Revised Statute (ORS 610.002), coyotes are classified as predatory animals, so harvest levels expressed for recent years may not include any take for control purposes on private lands. Southeastern Oregon leads harvest by both trappers and hunters, with Malheur County having 834 coyotes harvested by trappers and Harney County having 486 coyotes taken by hunters. Average pelt price for the 2010-2011 season was about $35.

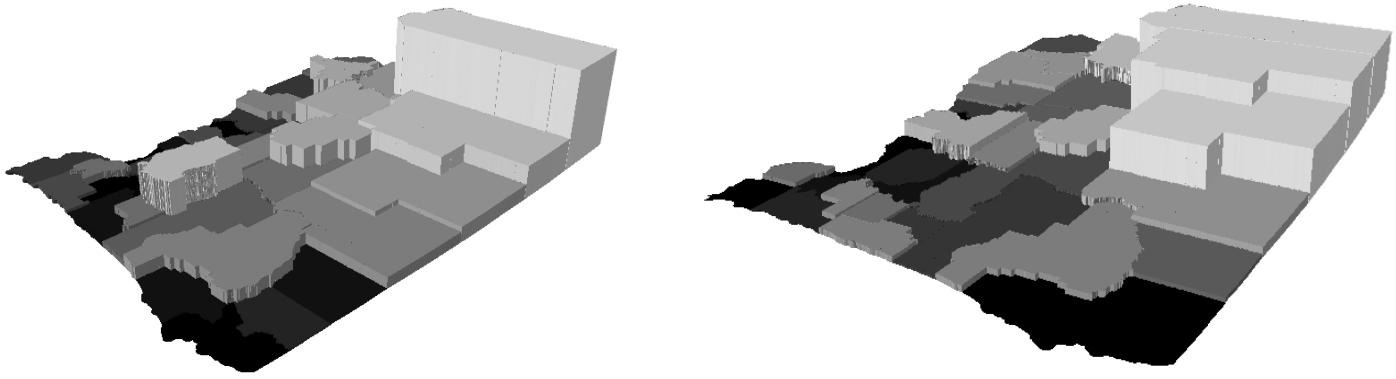
Annual pelt values of coyotes during 1941-2010. Values are not corrected for inflation.



Annual harvest of coyotes by trappers in Oregon during 1946-2010.



Relative number of coyotes taken by trappers (left) and hunters (right) in Oregon during the 2010-2011 season.



Gray Fox (*Urocyon cinereoargenteus*)

This species of fox is most common in the southwestern portion of Oregon but may exist as far north as the Columbia River. Recently, populations seemed to be very abundant, with evidence of some level of range expansion. A unique aspect of this canid is its ability to climb trees, even vertical limbless trees (see photo at right).

A gray fox attracted to bait used during ODFW monitoring of black bear populations. Photo by Mark Vargas.

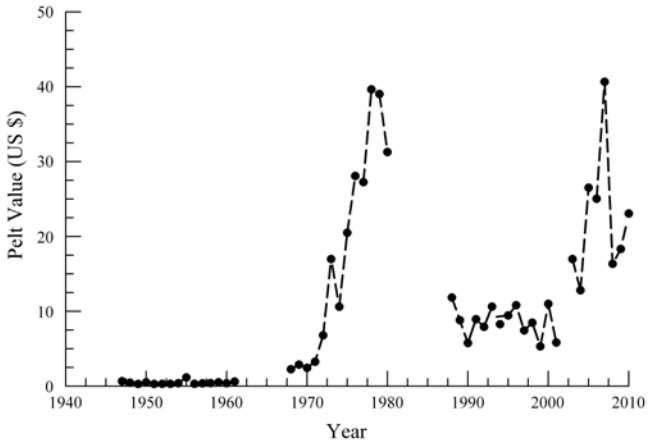
Rabies Monitoring in Josephine County

Since January 2010, 10 gray foxes and 1 coyote have tested positive for rabies in Josephine County. Most of these animals were found dead by landowners in a relatively small area east of Cave Junction and were collected by ODFW staff for testing. Rabies is an extremely rare disease of mammals in Oregon and is generally confined to a small portion of the bat population. Based on damage complaints and trapping records, fox populations in Josephine County appear to be at a 10-year high. ODFW will continue to monitor the disease and collect foxes for testing. Furtakers are encouraged to wear disposable gloves when processing hides, wash hands thoroughly, and report any strange wildlife behavior to ODFW.

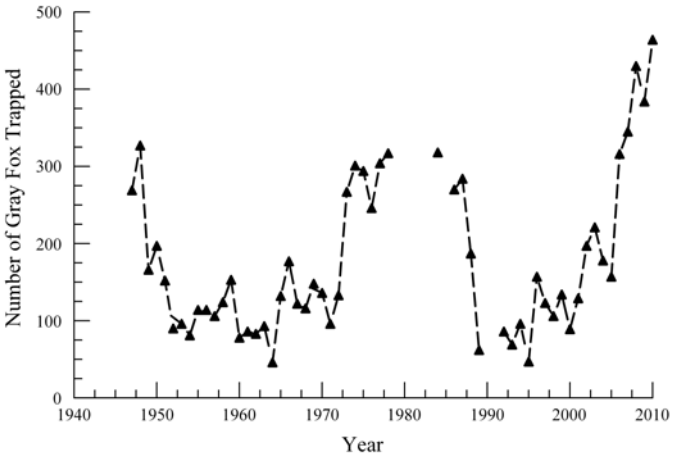
Harvest

Gray fox were first classified as furbearers in 1979 following a period of little regulatory protection. Southwestern Oregon has higher harvest levels relative to the rest of the state. A total of 464 and 191 were taken by trappers and hunters during the 2010-2011 season, respectively, and is probably a reflection of an increasing population. Average pelt price for 2010-2011 was $23.

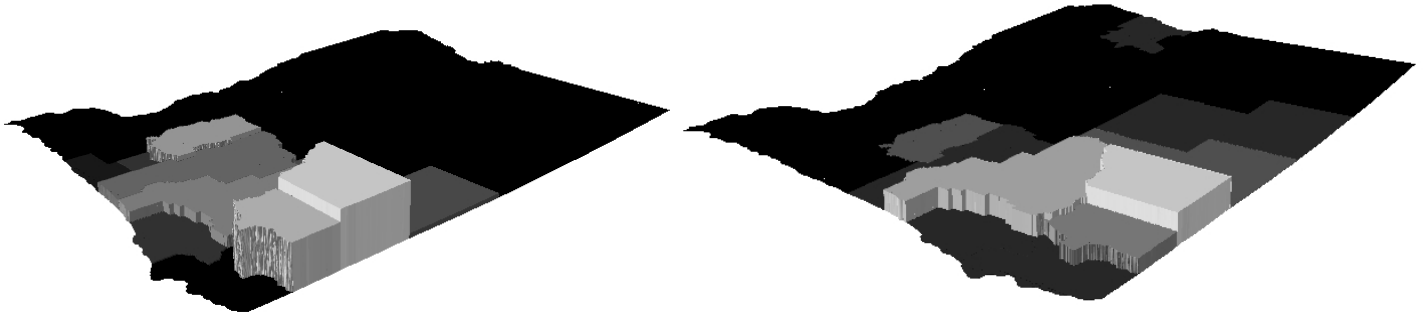
Annual pelt values of gray fox during 1947-2010. Values are not corrected for inflation.



Annual harvest of gray fox by trappers in Oregon during 1947-2010.



Relative number of gray fox taken by trappers (left) and hunters (right) in Oregon during the 2010-2011 season.



Marten (*Martes americana*)

American marten are a mink-sized mustelid that rely on forested areas to meet life requisites. In Oregon, marten are generally found above 5,000 feet in elevation, but there are exceptions (see below). Higher elevations typically yield higher snow depths, which probably help marten avoid mammalian predators such as fishers and bobcats. Small mammals, such as squirrels, mice, and voles, are important prey items for marten, and marten populations probably fluctuate at least partially in response to prey abundance.

Indirect Effects of Climate Change on Marten in the Sierra Nevada and Cascade Mountains

The geographic range of the American marten has contracted in both the Cascades of California and in the Coast Ranges of the Pacific states. Thus, the species has become one of conservation concern in portions of California, Oregon, and Washington. Dr. William Zielinski, U.S. Department of Agriculture Pacific Southwest Research Station, and colleagues have proposed work to increase our understanding of how contractions in the range may have affected marten genetic diversity. Such changes are expected to increase as warming and variable climates further reduce habitat for marten. Thus, an assessment of changes in genetic diversity that may have occurred during the last 50-100 years will foreshadow likely additional changes in the genome that will occur as future climate change further affects the distribution of montane and alpine forest habitats.

These researchers seek to understand how the genome has changed over time in 2 locations: the population in the Cascades of California and the population in the southern Cascades of Oregon. This work requires comparing the genome of martens in both these populations from the historical period (pre-1955) with contemporary samples (post-2000). They have developed a list of 222 museums using recommendations from the American Society of Mammalogists, and queried the collections from the 76 museums that were most likely to have specimens from California and Oregon. Of these, 18 contained holdings of interest. Specimens from California and Oregon totaled 538: 270 samples from what they have defined as their historical period and 268 contemporary samples. This coming fall and winter, the researchers plan to travel to museums with significant holdings that meet their needs. They will collect appropriate bone and/or tissue for DNA extraction and to sequence the samples for analysis.

The contemporary samples come from their recent related work on marten, and from their collaborators, including Oregon State University, Oregon Department of Fish and Wildlife, California Department of Fish and Game, Bureau of Land Management, and the U.S. Department of Agriculture Rocky Mountain Research Station. This list now includes 1,230 samples of tissue, blood, hair, and scats. Dr. Zielinski and his colleagues mapped the locations of all sample collections to determine scope and coverage. To add to the number of contemporary samples, they began field sampling during summer 2010 in areas where significant museum or existing field samples were lacking. They will contrast the historical and contemporary sample using genetic metrics such as heterozygosity, allelic diversity, and measures of genetic subdivision within populations.

This work will help the U.S. Forest Service and their partners understand the effect of climate change on the genetic diversity of a key montane species, the marten, and the implications of predicted vegetation change on the ability of marten to adapt to change. Science has produced regional global climate models that predict change in temperature and precipitation, and the effect of these changes on vegetation. However, unless changes in genetic diversity of key species are tracked as a function of changing montane habitats, a critical component of the effect of future climate change on biodiversity will be missed. This project will provide an example of such a contribution. If, as these researchers predict, genetic diversity has decreased as a result of range contraction, and additional contraction due to future climate change is expected, this information will stimulate state and federal managers to plan for connecting existing habitat areas and to assure gene flow among current reserves, and the predicted locations of future habitat areas. This information will help assess the current risk faced by marten in the northern Sierra and elsewhere and to inform decisions about more radical conservation measures, such as assisted migration.

Marten (*continued*)

Marten Multi-State Habitat Assessment Project

Dr. Anita Morzillo at Oregon State University is serving as lead investigator for the wildlife habitat module of the Integrated Landscape Assessment Project (http://oregonstate.edu/inr/node/51), funded by the U.S. Forest Service. The objective of this project is to evaluate watershed-level prioritization of land management actions based on fuel conditions, wildlife and aquatic habitats, economic values, and projected climate change across Oregon, Washington, Arizona, and New Mexico. The project examines current fuel conditions and assesses how these conditions may affect wildlife habitats, as well as the economic potential of fuel removal and new economic development. Approximately 24 wildlife species were selected for evaluation, based on the ability to evaluate habitat from model output categories (cover type, stand characteristics). Wildlife species included for the Oregon and Washington analysis include American marten, gray wolf, fisher, snowshoe hare, and western gray squirrel. The wildlife module team is nearing completion of defining species-habitat relationships, and presentation of preliminary results. Contact Anita Morzillo (anita.morzillo@oregonstate.edu) for more information.

Marten Habitat in the Blue Mountains

Mark Penninger, Wildlife Program Manager for the Wallowa-Whitman National Forest, has worked to model source, secondary, and potential habitat for American marten, and has started a systematic survey for marten on the Forest. Surveys utilize remote cameras and snow-tracking during winter, and remote cameras and track plates during summer and fall. This survey is intended to validate the habitat model and to determine the current distribution of marten on the Forest. There is potential for the Malheur and Umatilla National Forests to join in the survey effort to provide data for the entire Blue Mountains. Partners in this effort to date include the Oregon Department of Fish and Wildlife, Hell's Canyon Preservation Council, and The Wolverine Foundation. Future efforts may include an investigation of the population structure, relatedness, and abundance of marten in the Blue Mountains of northeastern Oregon. Hair collection devices would be deployed at remote camera and track plate sites to determine if the Blue Mountains marten population is well connected or if it exists in isolated subpopulations with little or no genetic exchange among subpopulations. In this case, remote cameras and DNA would serve to mark and recapture individual marten, forgoing the need to capture and handle them directly.

Beaver carcasses are often used as bait to attract carnivores, such as marten, fishers, and wolverines, during monitoring efforts by the U.S. Forest Service. Photo by Justin Hadwen.

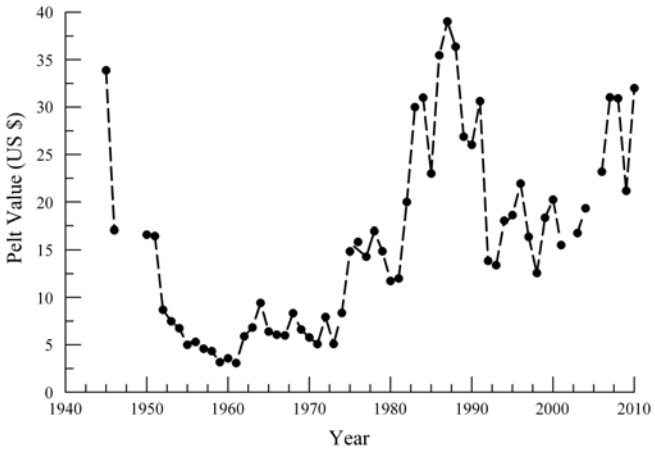
Marten (*continued*)

Harvest

Past Game Division reports indicate that harvest of marten was closed from about 1941 to 1949, and likely during portions of the 1930s. Harvest records for marten start during the 1924-1925 season, with more than 400 harvested annually during the 1920s. Based on data collected during this past season, a minimum of 45 marten was harvested. Most recent harvest occurs in the Cascades of Douglas, Lane, and Deschutes counties, but also often in the Blue Mountain region of northeastern Oregon. Few trappers, generally 4 to 8, have pursued marten in recent years, though experienced trappers consistently harvest marten. Harvest of marten in the Coast Range is extremely rare.

Two American marten, including 1 lactating female, visit a bait station on a wolverine detection project in northeastern Oregon during early 2011. Photo by Audrey Magoun.

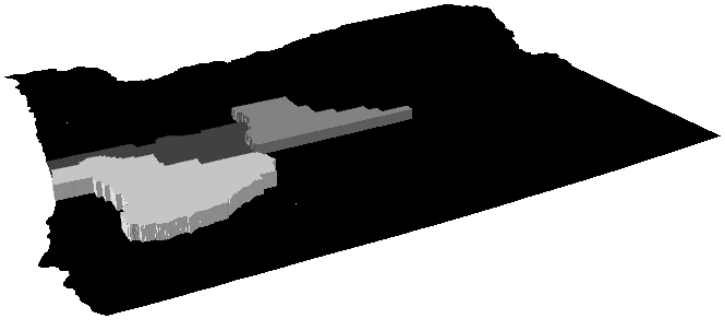
Annual pelt values of marten during 1945-2010. Values are not corrected for inflation.



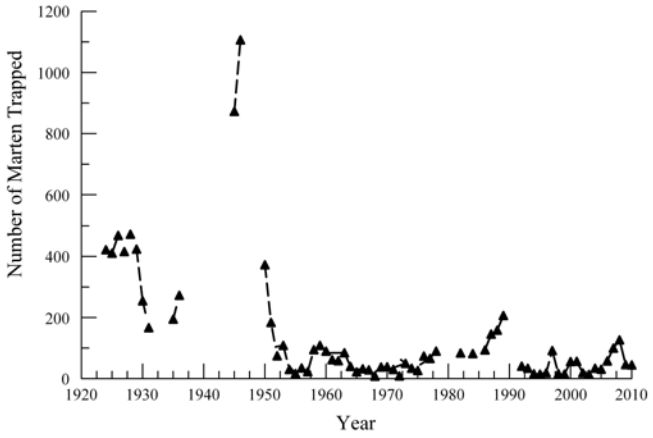
Important Marten Harvest Information

The Oregon Department of Fish and Wildlife requests that furtakers provide the date, location of harvest, sex, and carcass of all marten harvested. This information may be submitted to the local ODFW office prior to March 1 following each season. Carcasses are assessed for reproductive status (females only) and a tooth is removed and submitted to a laboratory for aging individuals. Furtaker cooperation is critical to successful future management of this species, as this information is difficult and costly to obtain.

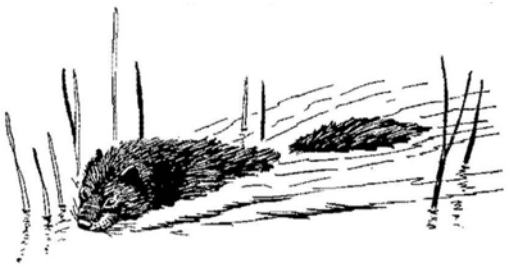
Relative number of marten taken by trappers in Oregon during the 2010-2011 season.



Annual harvest of marten by trappers in Oregon during 1924-2010.



Mink (*Neovison vison*)

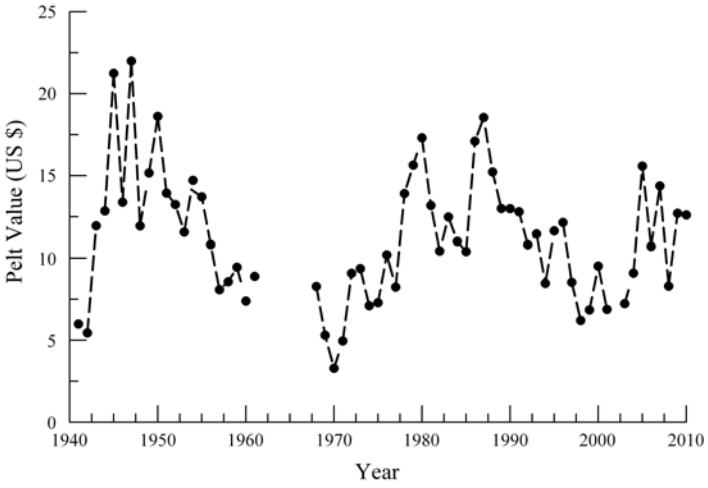


American mink are distributed throughout the U.S. and Canada with the exception of arid southwestern regions. This species is considered invasive in Europe and directly competes with the smaller native species of mink and otter found there. Mink are generally considered to be semi-aquatic and are usually found in proximity to rivers, streams, ponds, and other water sources. Dive depths may reach up to 18 feet. Muskrats are an important prey item for mink, but mink also utilize waterfowl and their eggs, fish, amphibians, crayfish, and small mammals for food. Raptors, river otters, bobcats, and wild canids may prey upon mink. Mink have been used as indicators of pollution, such as heavy metals, due to their low tolerance of such.

Harvest

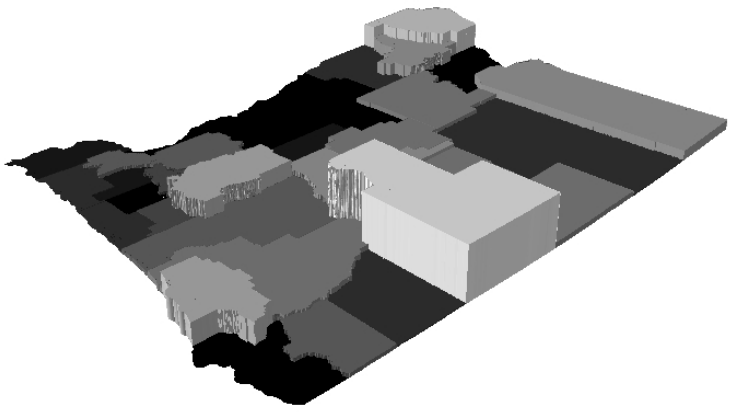
Trapper-harvest of mink has experienced a long-term decline over the past several decades, probably in part to declining pelt values and decreasing annual number of trappers. During 2010-2011, Klamath County led with a harvest of 90 mink, which was probably reflective of trapping efforts for muskrats; total statewide harvest was estimated to be a minimum of 353. Pelt values have shown large annual fluctuations, with some minor recovery in recent years. Smaller female mink tend to have pelts valued at around two-thirds that of larger males.

Annual pelt values of mink during 1941-2010. Values are not corrected for inflation.

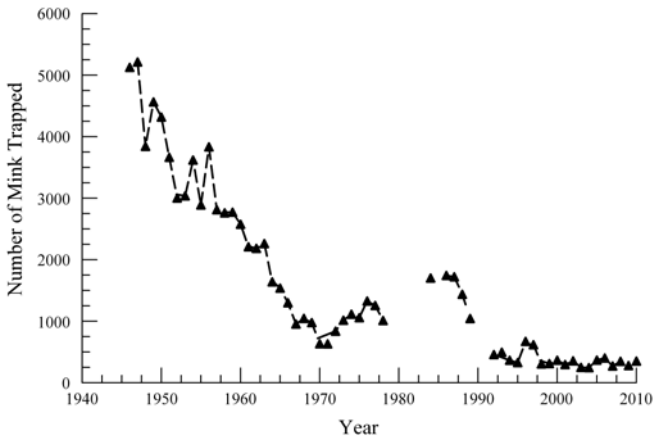


An employee at North American Fur Auctions in Wisconsin grades and sorts ranch mink. Photo by Tim Hiller.

Relative number of mink taken by trappers in Oregon during the 2010-2011 season.



Annual harvest of mink by trappers in Oregon during 1946-2010.



Muskrat (*Ondatra zibethicus*)

Muskrats are aquatic omnivores that exist from Alaska to northern Mexico and have viable populations in western Europe, Japan, Russia, and Scandinavia through introductions. Depending on environmental conditions, such as water depth, muskrats may construct huts (often in marshes) or dig bank dens (often in ponds, rivers, and streams). Bank dens adjacent to agricultural fields or golf courses may be a safety hazard if heavy equipment collapses the tunnels away from the water.

Under ideal conditions, this rodent may produce up to 4 litters per year. Studies have shown that up to 80% of a muskrat population may be harvested without detrimental effects. However, populations are heavily dependent on weather conditions (and may be cyclic), which should be considered in years of low population abundance. Spring is the primary time for dispersal of muskrats, and the number of muskrats killed on roadways at that time might indicate population status.

Trapping at Klamath Wildlife Area

Trapping and hunting on certain ODFW Wildlife Areas is closed except by permit only. Permits are assigned by the respective Wildlife Area Manager. Klamath Wildlife Area is comprised of 4 geographically distinct units. Shoalwater Bay and Sesti Tgawaals units are both located on the west side of Upper Klamath Lake, and water levels vary with lake levels. Gorr Island Unit is located in the Klamath River approximately 6 miles downstream from Klamath Falls and is accessible only by boat. The Miller Island Unit is located just south of Klamath Falls, and is accessible by public road, and subsequently has more public use than the other 3 units.

Klamath Wildlife Area provides 2 types of opportunities for trapping furbearers during the course of the year. The Gorr Island, Shoalwater Bay, and Sesti Tgawaals Units all allow furbearer trapping without a Klamath Wildlife Area permit during the trapping season. The Miller Island Unit requires a permit to trap furbearers during a specific time period, and with specific conditions.

Trapping on the Miller Island Unit begins immediately following the last day of the fall waterfowl seasons, and is allowed until the last day of February. Trappers must express interest to the Klamath Wildlife Area Manager prior to the start of the trapping season. After the season begins, no other trapping permits will be issued, except to address an acute specific furbearer issue (e.g., beaver damage at water structures).

Number of traps per trapper is regulated, ranging from 50 to 100 traps per trapper, and based on the number of trappers interested in trapping, available water conditions, and other factors. There is a total of 1200 acres of wetlands on the Miller Island Unit, and of that, approximately 600 acres would provide for suitable trapping. With less than 4 trappers, normally 100 traps per trapper is allowed. More than 4 trappers would drop the number to 50 traps per trapper with maximum of 8 trappers allowed to obtain permits. Trapping permits are limited to no more than 8 trappers during a given season and are allocated on a first-come, first-served basis. If the number of interested trappers exceeds 8, then a random draw will be implemented.

In order to maintain a viable breeding population of muskrat, trapping is not allowed within 10 feet of a muskrat mound. Trappers must provide a detailed harvest report, including number of each species harvested and number of days trapped, at the end of the trapping season to the Klamath Wildlife Area Manager.

Muskrat (*continued*)

Trapping at Summer Lake Wildlife Area

Summer Lake Wildlife Area also allows trapping, but also by permit only. Typically, trappers are assigned portions of the wildlife area on a first-come, first-served basis. However, for the coming trapping season, a new random-draw system will be implemented in response to input from interested trappers. Trapping on the main marsh of this wildlife area usually begins on the day following closure of waterfowl hunting seasons to avoid potential conflicts between trappers and waterfowl hunters and to increase trapper access with the allowance of vehicle travel. Trapping on marsh areas of this wildlife area ends on March 15 to reduce disturbance to migrating waterbirds and coincide with seasonal road closures.

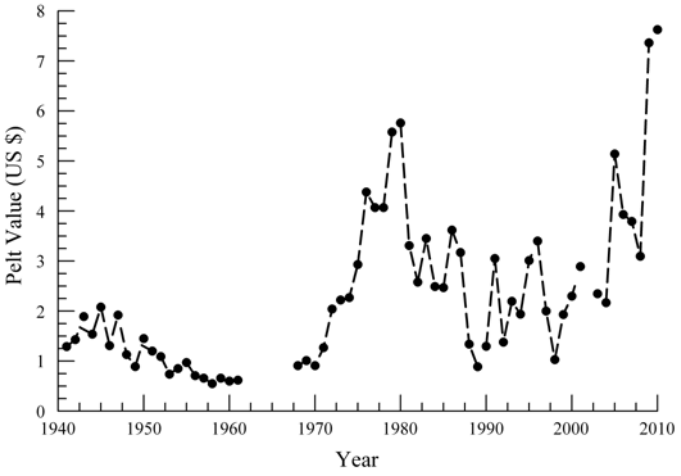
No muskrat harvest quotas were imposed during 2011 and trapping was encouraged along roads and dikes due to damage caused by muskrat burrows. However, weather conditions during the 2011 trapping season were not favorable for trapping. This past season was characterized by freezing temperatures, strong winds, and occasional precipitation. In addition, wetland enhancement activities associated with the Short-Term Habitat Implementation Plan for the wildlife area has and will continue to negatively affect muskrat habitat and therefore, muskrat population size. Summer Lake Wildlife Management Area was established and receives state and federal funding for the primary objective of waterfowl habitat management.

The 2011 muskrat house count of 231 was down 24% from 2010, and remained well below the long-term average. The count was conducted with marginal snow cover spanning several days. The 2011 muskrat harvest was 391, which was well below the long-term average of 1,122.

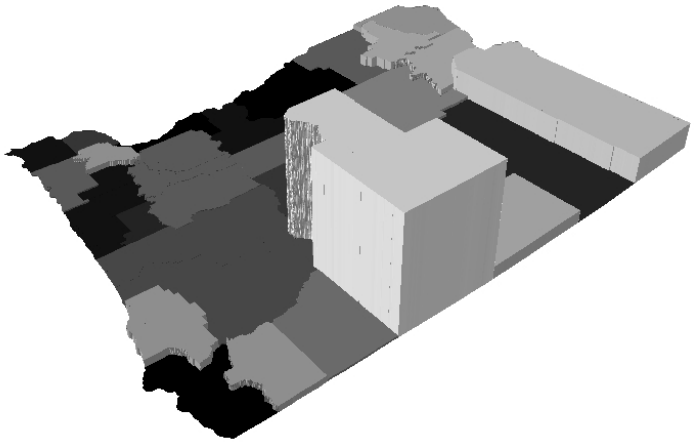
Harvest

As with most furbearing species, long-term harvest of muskrats has decreased, except for a temporary increase during the fur boom of the 1970s and 1980s. During 2010-2011, Klamath County easily led the state with almost 4,500 harvested. No harvest of muskrats was estimated to occur in 3 counties during the past season. Uncorrected pelt values seem to be at an all-time high, with 2010-2011 sales of muskrats having close to or exceeding $8 in many regions. Recently, China has been a major market for muskrats, with the focus on bellies because of its soft characteristics.

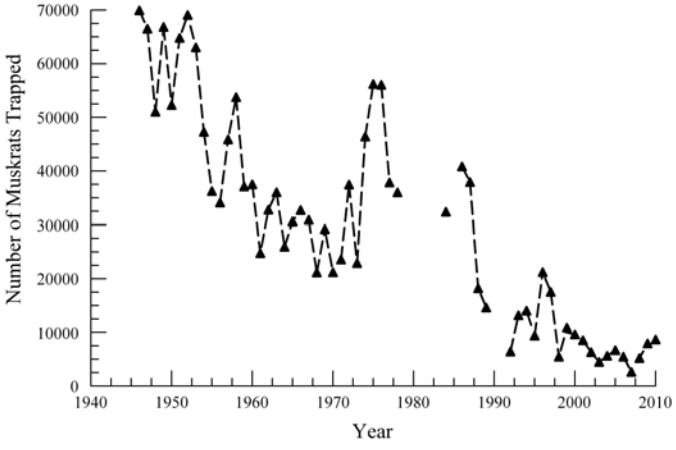
Annual pelt values of muskrats during 1941-2010. Values are not corrected for inflation.



Relative number of muskrats taken by trappers in Oregon during the 2010-2011 season.



Annual harvest of muskrats by trappers in Oregon during 1946-2010.



Nutria (*Myocastor coypus*)

Nutria are an invasive species that are well-adapted to the milder climates of the Pacific Northwest, Gulf states, and many New England states. Photo by Tim Hiller.

Nutria are rodents native to the southern half of South America, and may be mistaken by the causal observer as either a beaver or a muskrat as by size it falls in between these 2 native species. Although beavers and muskrats may use lodges or huts, respectively, for shelter, nutria seem only to construct bank dens. In North America, nutria seemed confined to the milder climates of the Pacific Northwest, Gulf coast, and northeastern states. These populations started to establish in the 1930s, probably as a combination of escapees and purposeful large-scale releases from fur farms after fur prices dropped substantially. Records indicate an increasing concern over nutria populations soon after this time and that they seem to have become fully established in western Oregon by 1960. Oregon law prohibits the possession of live nutria, but this invasive species is an unprotected mammal in this state. Severe winter weather seems to have a major negative impact on nutria populations. Extensive ecological damage may result with high densities of invasive nutria, such as soil erosion through removal of large quantities of vegetation. Nutria may be directly competing with muskrats, which therefore may cause population declines of the latter.

Polk County Nutria Management Program

In 2010, the Polk Soil and Water Conservation District secured federal funding for a nutria management program in Polk County. The objectives included public education, damage control, disease monitoring, and bounty implementation. Interested residents attended a nutria management workshop and were loaned cage-traps to capture nutria. The District partnered with Oregon State University for disease monitoring and with the Oregon Department of Fish and Wildlife for assessment of nutria population characteristics, including additional disease monitoring, sex-age structure and stress assessments, and other aspects. The bounty program will run through fall 2012 or until funding runs out, whichever comes first.

Portland State University Nutria Research Project

Portland State University Ph.D. student Trevor Sheffels is currently conducting research on nutria behavior in urban environments and associated management implications. Nutria are often found in close contact with humans in the Pacific Northwest, but this association has not previously been studied. The main objectives of this research are to learn more about factors influencing regional nutria population dynamics, assess human influence on nutria behavior, and evaluate nutria damage mitigation and control techniques applicable to the urban environment. The research objectives are designed to provide region-specific information on the control and management of nutria in the Pacific Northwest.

(*continued on next page*)

Nutria (*continued*)

Portland State University Nutria Research Project (*continued*)

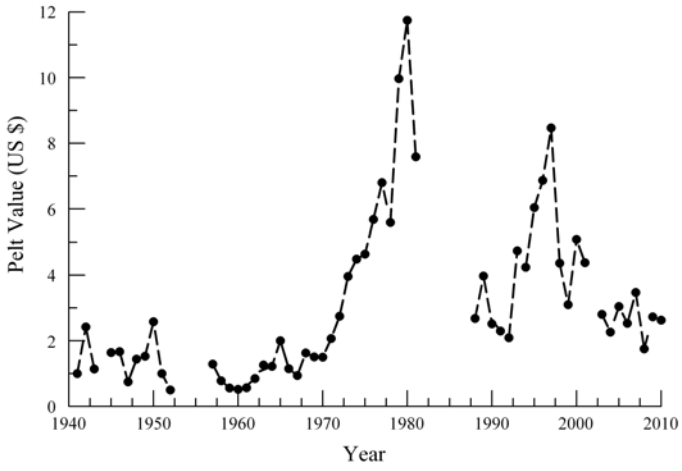
These objectives will be met through several methods. The development of spatial models in partnership with the U.S. Geological Survey laboratory in Fort Collins, CO, is underway to identify suitable nutria habitat in the region. Disease testing for the presence of *Salmonella* bacteria and other diseases will provide information about the health of the regional population and potential human safety concerns. Telemetry methods are being used to assess the influence that human feeding has on nutria activity and movement patterns. The use of seedling tubes to mitigate nutria herbivory is also being assessed. Finally, the efficacy of a new nutria multiple -capture trap design is being compared to a standard cage-trap design for potential urban applications. Sheffels recently participated in the filming of a 1-hour nutria documentary to discuss the Oregon nutria problem and highlight current research. The documentary is scheduled to air on the National Geographic Channel some time in early fall 2011.

Harvest

Long-term nutria harvest slightly increased starting in the mid-1950s, after which harvest levels quickly increased. Harvest of nutria in Oregon is limited to the Willamette Valley west to the Pacific coast. At least 2,000 nutria were harvested during the 2010-2011 season. Almost of third of these were harvested in Linn County.

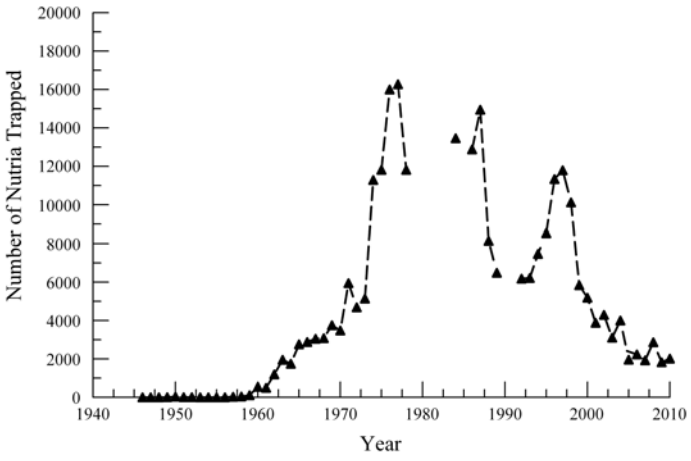
During the early 1980s, pelt values for nutria peaked at almost $12. However, the past decade has had very low pelt values for nutria, leaving little incentive for most trappers to purposefully harvest this invasive species. Future markets with the Chinese may lead to higher pelt values, which might possibly be high enough to exceed a relatively unknown threshold that results in substantially higher harvests.

Annual pelt values of nutria during 1941-2010. Values are not corrected for inflation.



Relative number of nutria taken by trappers in Oregon during the 2010-2011 season.

Annual harvest of nutria by trappers in Oregon during 1946-2010.



Opossum (*Didelphis virginiana*)

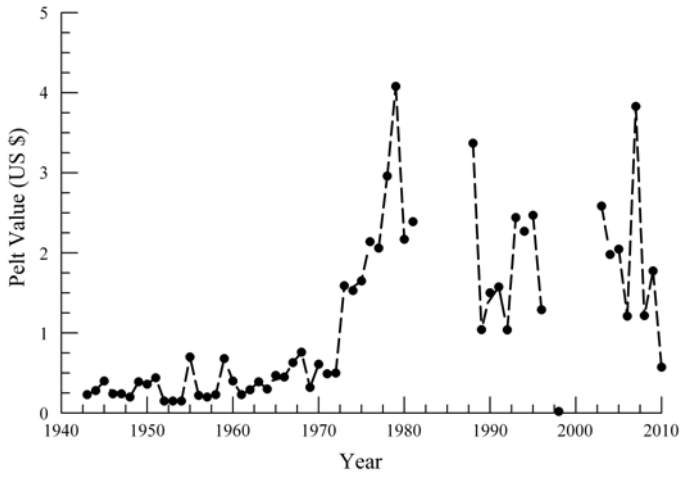
The only marsupial native to North America is the Virginia opossum, or simply opossum. Opossums were introduced from the eastern U.S. to areas along the Pacific coast during the early 1900s. Game Division reports indicate that starting in 1960, opossum populations started to substantially increase. As with nutria, opossums are considered a prohibited species under Oregon Administrative Rule (Division 56), whereby live specimens generally may not be imported, possessed, sold, purchased, exchanged, or transported in the state. Opossums have also naturally expanded their geographic distribution, especially northward into southern Canada, probably as the result of landscape-level land-use changes. The opossum is truly a generalist species in that it can persist in many vegetation types and, as an omnivore, can utilize most any food item. Mortality rates are generally high, with predators ranging from coyotes to great horned owls.

Opossums may feign "death" to avoid predation, but this behavior is highly variable in individuals. Photo by Tim Hiller.

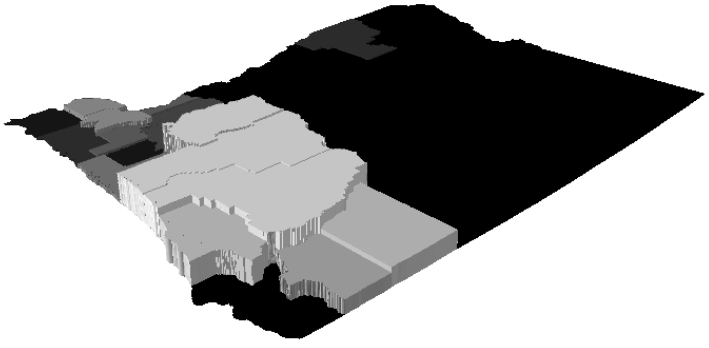
Harvest

During the fur boom of the 1970s, harvest often exceeded 1,000 annually, and almost 5,000 during 1978. However, in recent years, harvest by trappers has generally been 500-600 individuals. During the 2010 -2011 season, trappers harvested at least 599 opossums. Ninety-nine percent of the harvest came from counties west of the peak of the Cascades, but a handful of individuals came from Umatilla and Union counties. Pelt values generally have never been particularly high.

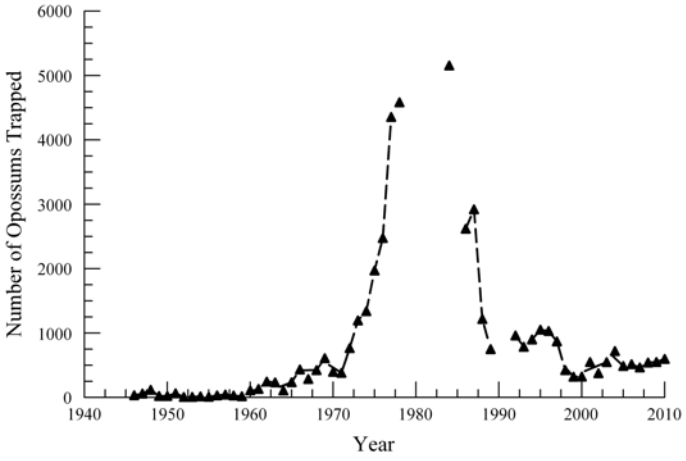
Annual pelt values of opossums during 1943-2010. Values are not corrected for inflation.



Relative number of opossums taken by trappers in Oregon during the 2010-2011 season.



Annual harvest of opossum by trappers in Oregon during 1946-2010.



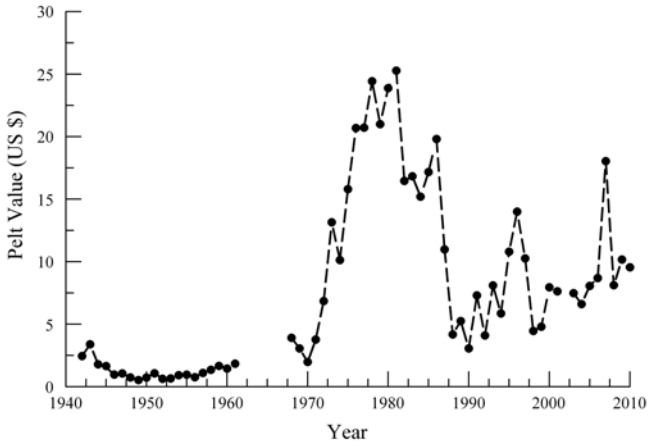
Raccoon (*Procyon lotor*)

Raccoons are one of the most abundant mammals in North America. Their distribution extends from southern Canada to Panama and from coast to coast. Raccoons have been extending their range northward into the Canadian prairies, which may have long-term consequences for prairie-nesting waterfowl. Like many wildlife species, raccoons have been introduced in portions of Europe and Asia, which has had ecological and economic consequences. They are distributed throughout much of Oregon (except at higher elevations), but in eastern Oregon may be limited to areas with permanent water supplies. Like opossums, raccoons are generalists that can persist under a wide range of environmental conditions and can subsist on a wide variety of food items. They are also well adapted to urban settings and may cause problems for landowners by searching for food in trash cans and using attics and chimneys as shelter.

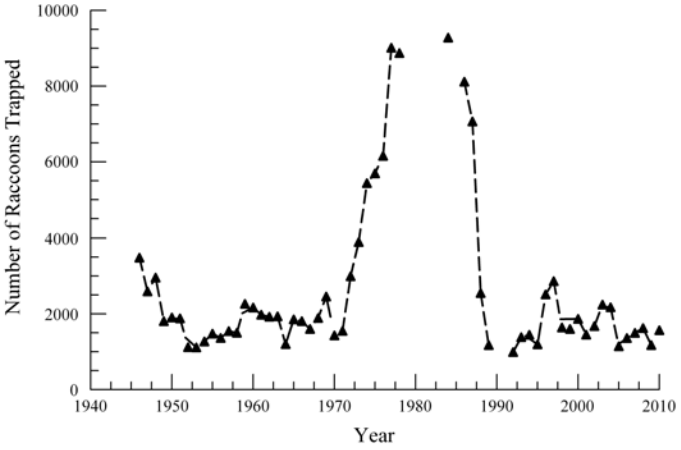
Harvest

Along with muskrats, raccoons are of high importance in the fur industry by sheer quantity and almost irrespective of fur prices. In Oregon, the first harvest season for raccoons opened in 1942-1943. During the 2010-2011 season, statewide harvest of raccoons was 1,567 from trapping and 814 from hunting, for a minimum estimated harvest of 2,381. As expected, harvest was unevenly distributed throughout the state, with most taken in the Willamette Valley and relatively few in many eastern counties. A high of $25 occurred during 1981, but recently raccoon pelts have averaged about $10.

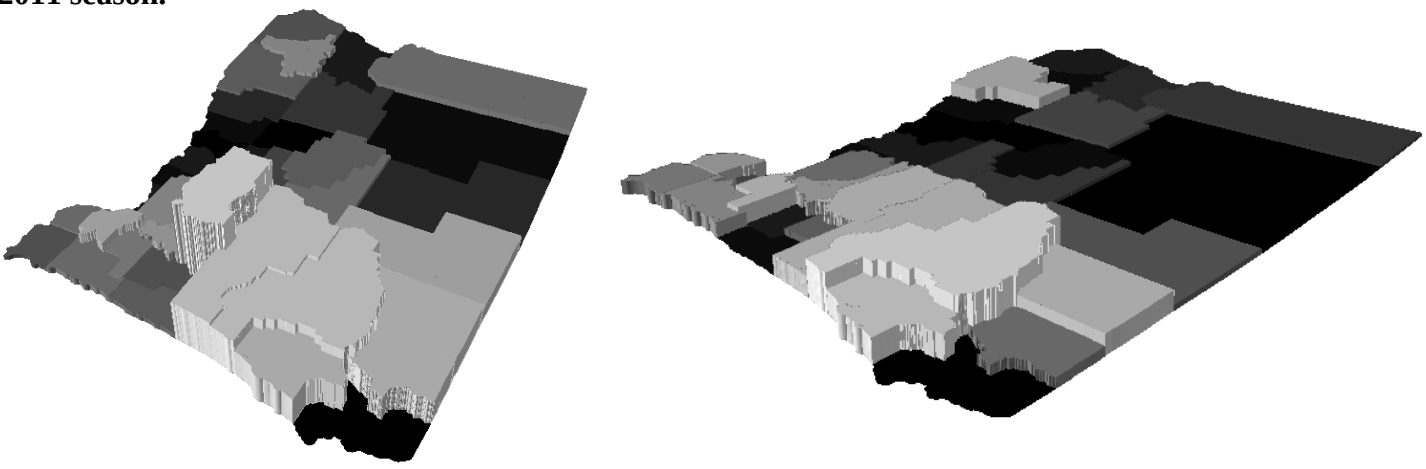
Annual pelt values of raccoons during 1942-2010. Values are not corrected for inflation.



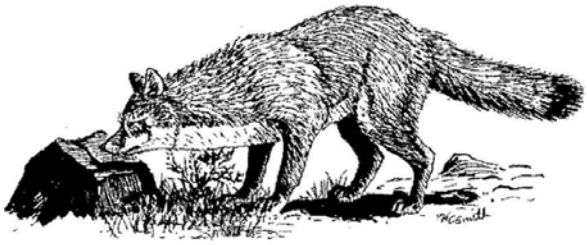
Annual harvest of raccoons by trappers in Oregon during 1946-2010.



Relative number of raccoons taken by trappers (left) and hunters (right) in Oregon during the 2010-2011 season.



Red Fox (*Vulpes vulpes*)



The red fox is the most widely distributed carnivore in the world; it has a holarctic distribution, meaning that it can be found throughout the northern continents of the world. Ironically, the pre-settlement distribution of red fox in North America does not seem to include the eastern or Midwestern portions of the U.S. Red fox were introduced into Australia in 1868; eradication efforts are underway there because of its negative impacts on native marsupials and other wildlife.

Questions about genetic relationships of red fox populations in Oregon and in the Pacific coast states persist. For example, whether red fox in the Willamette Valley are descendents of introduced red fox from the eastern U.S. or whether they are native seems unknown. The high-elevation montane populations, however, are thought to be ecologically and evolutionarily distinct. It is thought that these montane fox shifted northward and to higher elevations as habitat became available from retreating glaciers, and that they have been genetically isolated from other fox populations since that time.

Red Foxes in Oregon and California: Native or Not?

Native red foxes in the western U.S. are primarily restricted to high-elevation areas and are comprised of 3 montane subspecies: the Sierra Nevada red fox (*V. v. necator*), the Rocky Mountain red fox (*V. v. macroura*), and the Cascade red fox (*V. v. cascadensis*). Collectively, these 3 subspecies, along with Sacramento Valley red fox (*V. v. patwin*), reflect a distinct evolutionary lineage restricted to the western U.S. The 3 montane subspecies are ecologically and morphologically distinct from the Sacramento Valley and other North American subspecies, suggesting they reflect a snow-adapted lineage of montane specialists. Prior to European settlement of Oregon, red foxes were considered to be restricted to areas of the Cascade Range and the Wallowa Mountains. Little is known about these high-elevation specialists, but anecdotal reports indicate they are not as abundant as they once were, and they are absent from former areas of their range. In contrast, from the 1940s onward, red fox populations appeared in areas where they had not been historically, such as the Willamette Valley, and the Oregon coast. Many of these new or recently expanded populations occur in areas where fox farming occurred; however, they may be part of an expanding native population or potentially a mixture of native and non-native animals.

Researchers at the University of California-Davis (Dr. Mark Statham), California Polytechnic State University -San Luis Obispo, and their partners have been using genetics as a tool to determine the extent and range of native and non-native populations in California. Prior to their work, red foxes throughout low elevations of California were considered an invasive non-native species. These researchers found that low-elevation California red foxes did not form 1 large population, but that red foxes in Sacramento Valley were in fact a previously unrecognized native, with museum samples dating back to the 1880s, prior to the advent of fur-farming. This is in stark contrast to other low-elevation populations throughout the state. In the San Joaquin Valley, the San Francisco Bay area, and in Southern California, red fox populations all stem from fur-farmed stock from Canada and Alaska. This admixed non-native stock occurs in areas where red foxes were historically absent.

The Sierra Nevada red fox, which includes those in the Oregon Cascades, was once widespread throughout high-elevation areas of California in the southern Cascades and the Sierra Nevada. A routine carnivore survey during August 2010 in the Sonora Pass area of the Sierra Nevada confirmed a second remnant population of Sierra Nevada red fox in California. Ongoing efforts by U.C. Davis and ODFW are attempting to determine the range and extent of native and non-native red foxes in Oregon.

Red Fox (*continued*)

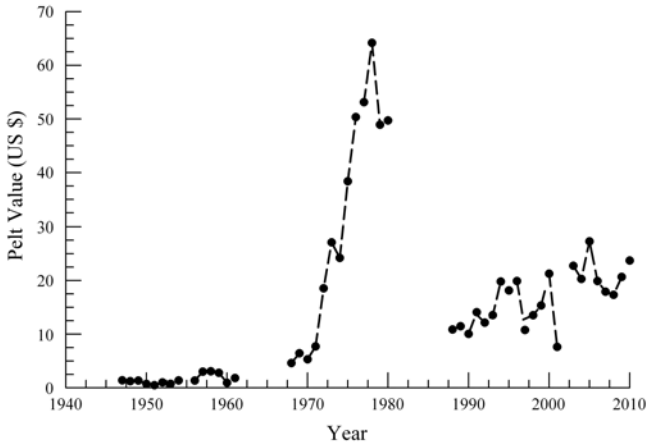
A cross fox (color phase of red fox) attracted to a bait station on the wolverine detection project in northeastern Oregon. Photo by Audrey Magoun.

Harvest

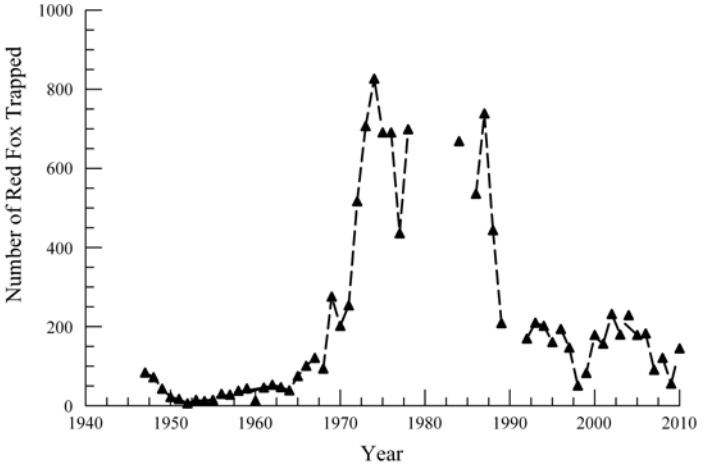
Red fox were first classified as furbearers in Oregon by statute in 1978. Prior to that, both red and gray fox were unprotected wildlife species. Relatively few red fox have been harvested in Oregon in recent years. Only about 145 were taken by trappers and 30 by hunters during 2010-2011. In both cases, around 90% of the harvest was in eastern Oregon counties.

Harvest-effort for red fox, like other species, often follows closely with demand. During the 1970s and 1980s, pelt values for red fox often exceeded $30, and even occasionally $50. During the 2010-2011 market, however, values remained relatively low with an average of about $24.

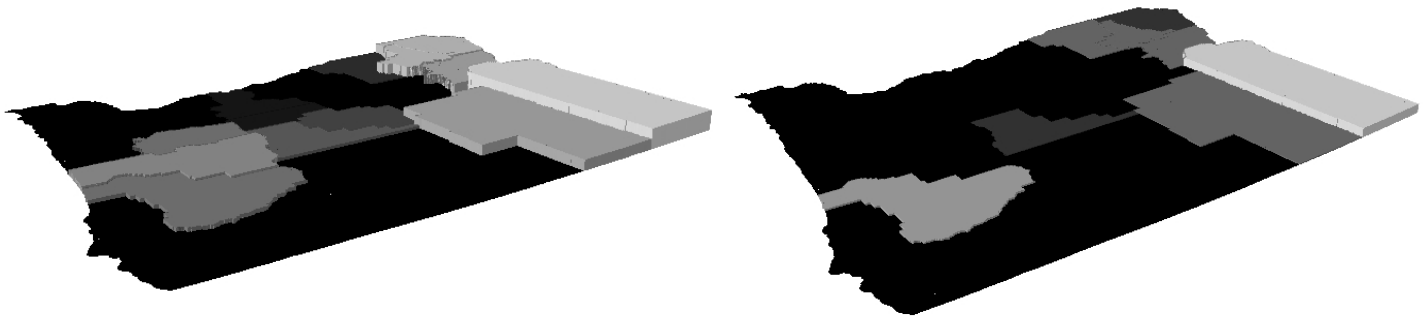
Annual pelt values of red fox during 1947-2010. Values are not corrected for inflation.



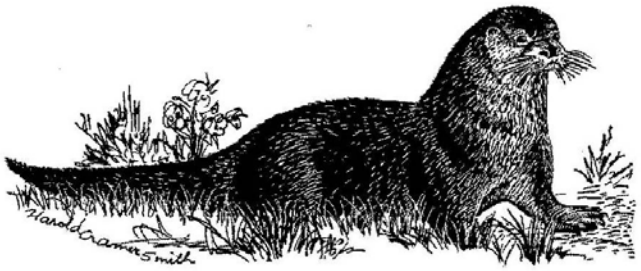
Annual harvest of red fox by trappers in Oregon during 1946-2010.



Relative number of red fox taken by trappers (left) and hunters (right) in Oregon during the 2010-2011 season.



River Otter (*Lontra canadensis*)



River otters were historically distributed throughout the U.S. and Canada. However, by the early 1900s, their populations were negatively affected by urbanization and pollution. During the past several decades, river otters have been successfully reintroduced into many states, such as Iowa and Missouri. Trappers played a major role in capturing river otters for these relocation projects by using foothold traps. In Oregon, river otters are most abundant west of the Cascades and in the northeast and can be found near permanent water sources, including seashores. The primary prey for river otters is fish, and otters may cause localized damage to fish stocks at hatcheries and small ponds where fish are concentrated. They also feed on amphibians and crustaceans. River otters are a relatively social mustelid, often traveling in small groups and over large distances.

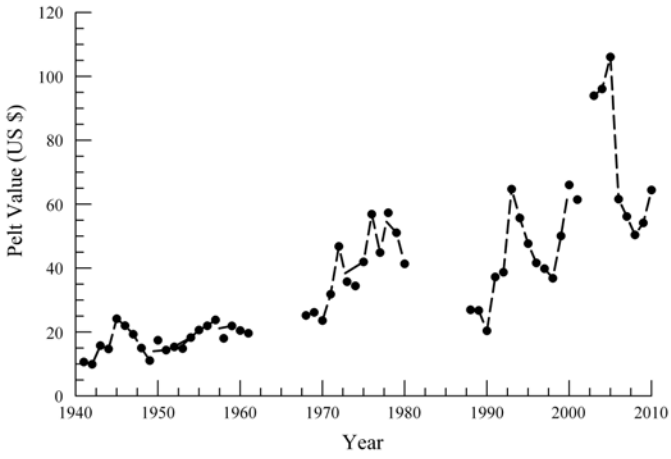
Along with bobcats, river otters were listed under Appendix II of the Endangered Species Act in 1977. As with bobcats, all river otter pelts must be tagged and the lower jaw surrendered to ODFW. Jaws are heated in hot water and a canine tooth extracted and sent to a laboratory for age analysis.

Harvest

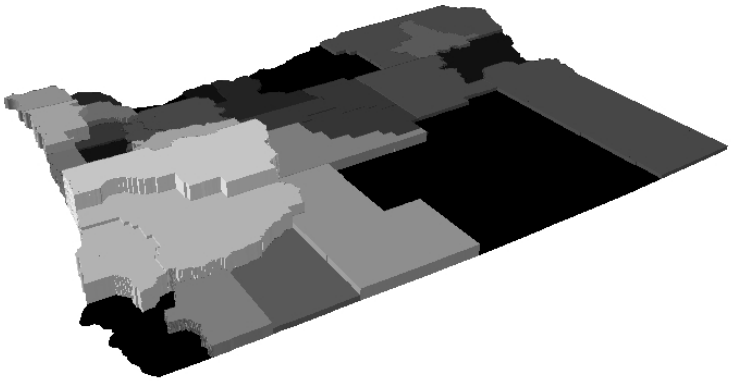
Statewide harvest of river otters in Oregon seems to show an increasing long-term trend, but has often been erratic from one year to the next. Higher harvest occurs in the eastern counties of Oregon, and few to none taken in the more arid southeastern region. Minimum statewide harvest for the 2010-2011 trapping season was 394.

Uncorrected pelt values for river otters also shows an increasing trend, with a high of over $100 in 2005. Prices decreased sharply in 2006 for various global reasons, but seem to be again increasing. For 2010-2011, river otters averaged about $65.

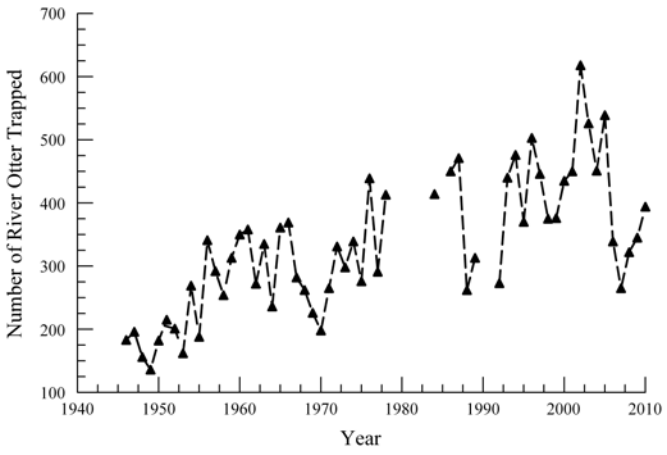
Annual pelt values of river otters during 1941-2010. Values are not corrected for inflation.



Relative number of river otters taken by trappers in Oregon during the 2010-2011 season.



Annual harvest of river otters by trappers in Oregon during 1946-2010.



Spotted Skunk (*Spilogale gracilis*)

Oregon has 2 species of skunks: the very familiar striped skunk (see next page) and the much smaller western spotted skunk. Western spotted skunks, also called civets, are common in most of the western U.S. and into Mexico. In Oregon, they may be absent at higher elevations of the northeast and the Cascades. These omnivores are active throughout the winter and often have small home ranges. Spotted skunks are strictly nocturnal.

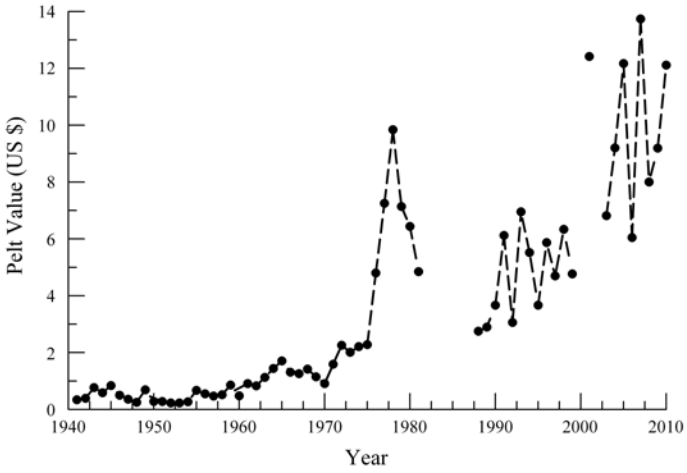
As a last resort, spotted skunks may spray musk at an intruder, but significant warning signs normally precede. Foot-stopping and hopping are common, and a handstand position using the forelegs is an unmistakable behavioral cue of an agitated individual. Ejection of musk with all 4 feet on the ground and the head and anus facing the intruder is probably a more common occurrence.

Harvest

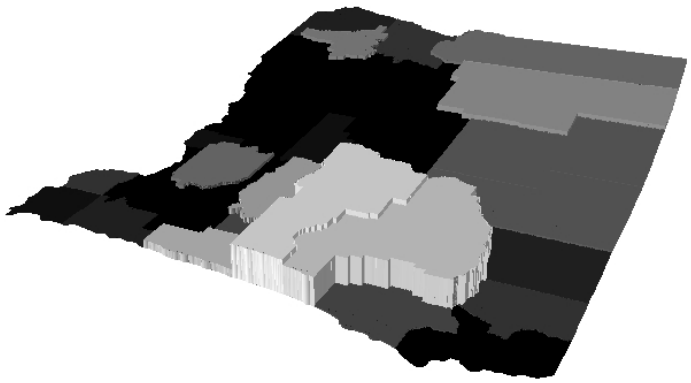
In the fur boom years, annual harvest of spotted skunks occasionally exceeded 1,000 individuals. Currently, most harvest occurs in Douglas and Lane counties. During the 2010-2011 trapping season, at least 314 were harvested.

During the fur boom, pelt values of spotted skunks peaked at an average of almost $10. In recent years, pelt values seem to have fluctuated (although this may be an artifact of small sample sizes at local fur auctions), with several annual averages exceeding the $10 mark.

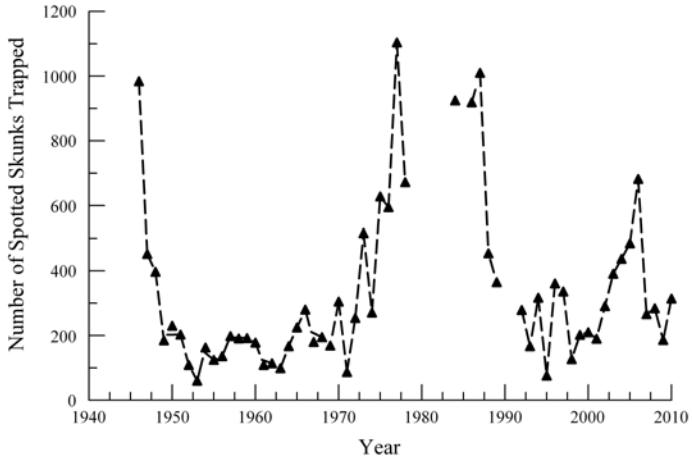
Annual pelt values of spotted skunks during 1941-2010. Values are not corrected for inflation.



Relative number of spotted skunks taken by trappers in Oregon during the 2010-2011 season.



Annual harvest of spotted skunks by trappers in Oregon during 1946-2010.



Striped Skunk (Mephitis mephitis)

Striped skunks are distributed throughout the U.S., southern provinces of Canada, and northern Mexico. In recent decades, like raccoons and opossums, striped skunks have been expanding their distribution northward. Populations of striped skunks may experience high annual turnover and fluctuation, which may partially result from disease outbreaks.

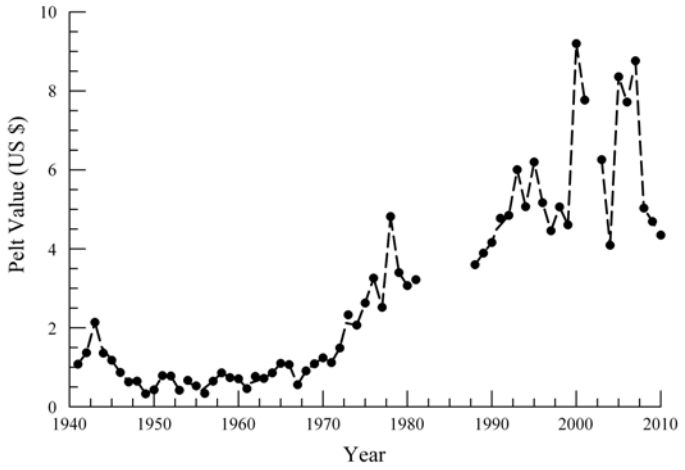
The proportion of white on the pelage among individual striped skunks can vary widely. Other pelage colorations, such as seal brown, white, and yellow, are known to occur. A set of paired anal glands may be used in self-defense by expelling a volatile musk that can cause skin and eye irritation. Control of direction and distance of musk discharge is better for adults than juveniles, and skunks may be able to hit a human from up to 18 feet away. Raptors are probably the major predator of skunks, although larger mammalian predators may prey on skunks. Damage from skunks may occur while they dig lawns for grubs, dig under building foundations, and depredate beehives. Unlike spotted skunks, striped skunks may become inactive in northern latitudes during winter.

Harvest

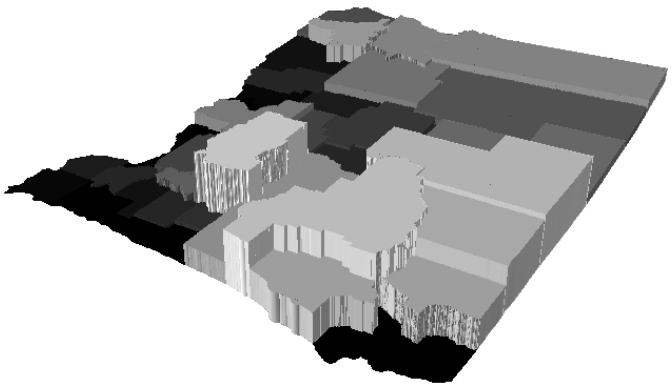
During the 1950s and 1960s, skunk pelts had little value as demand decreased. However, during the fur boom, harvest of striped skunks in Oregon exceeded 1,000 annually. The statewide minimum harvest of striped skunks by trappers during the 201-2011 season was 716, with 60% coming from counties west of the peak of the Cascades.

Pelt values for striped skunks seemed to have steadily increased over the years, with the 2010-2011 season average just under $5. Skunk essence (the fluid ejected by skunks for defensive purposes) often sells for more than the pelt, for those willing to collect it from their harvested skunks.

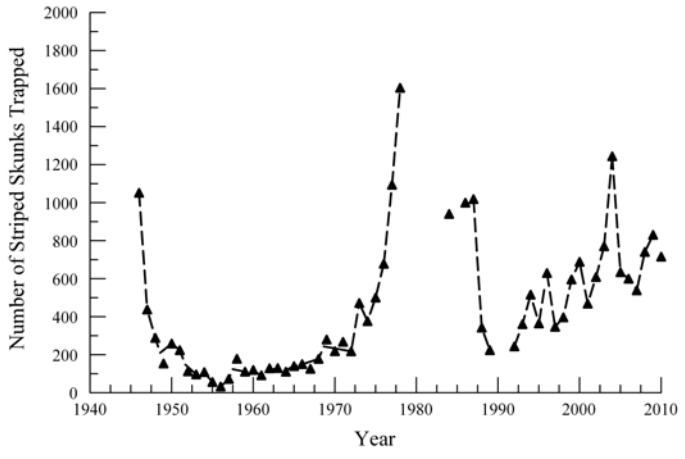
Annual pelt values of striped skunks during 1941-2010. Values are not corrected for inflation.



Relative number of striped skunks taken by trappers in Oregon during the 2010-2011 season.



Annual harvest of striped skunks by trappers in Oregon during 1946-2010.



Weasel

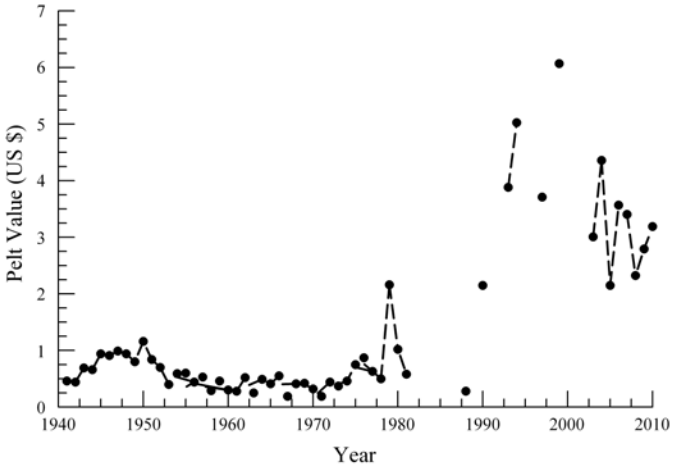
Short-tailed (*Mustela erminea*)
Long-tailed (*Mustela frenata*)

Oregon has 2 of the 3 species of North American weasels, with least weasels generally found in latitudes to the north of Oregon. Long-tailed weasels may be found statewide in Oregon, whereas short-tailed weasels (also called ermine) are found primarily in the Coast and Cascade ranges and in the Blue Mountain region. In Oregon, the short-tailed weasel may molt to a white winter pelt (except in western Oregon), whereas the long-tailed weasel seems to maintain its brown pelage throughout the year. Research on weasels is very sparse and difficult to conduct. Much of what is known about weasels comes from harvest data.

Weasel Research in Oregon

Dr. Clinton Epps and Mark Linnell of Oregon State University, in collaboration with Eric Forsman of the U.S. Forest Service Pacific Northwest Research Station, have initiated a project to explore habitat associations and co-occurrence of short-tailed and long-tailed weasels in the H. J. Andrews Experimental Forest in Lane and Linn counties. The objectives of this project are: 1) to explore methods for distinguishing short-tailed and long-tailed weasels at non-invasive stations, and 2) to ascertain habitat associations and co-occurrence of the 2 species. Non-invasive survey techniques, including hair-snares and track-plate boxes, will be modified from known methods to collect data on weasels. Using these data, they expect to explore molecular techniques to analyze hair collected from hair-snares and track-measurement techniques to analyze track data collected at track-plate stations. Occupancy modeling will be used to analyze habitat associations and co-occurrence of weasels on the Experimental Forest. Research is scheduled to begin during fall 2011. This project is funded by the U.S. Forest Service Pacific Northwest Research Station and Oregon State University.

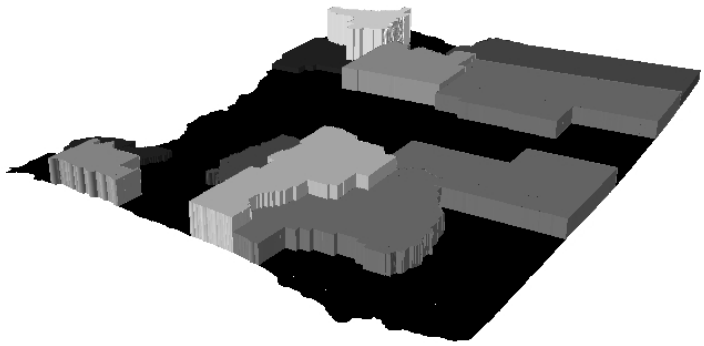
Annual pelt values of weasels during 1941-2010. Values are not corrected for inflation.



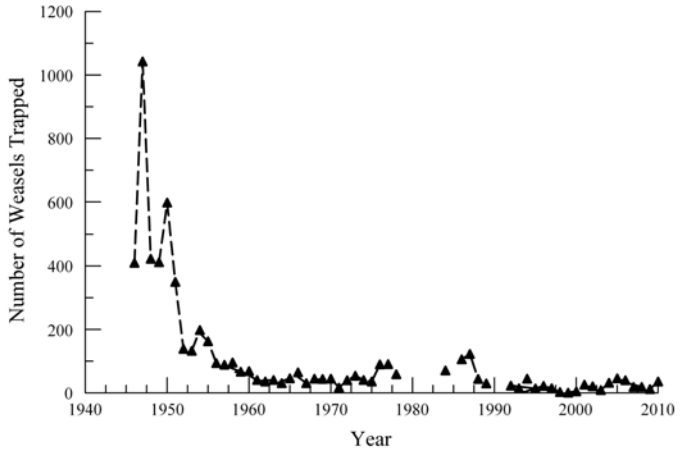
Harvest

Collective annual harvest of weasels has decreased substantially since the 1940s, which is probably the result of low pelt prices. Minimum harvest from trapping during the 2010-2011 season was 36 weasels. Pelt values for weasels (ermines) typically average $2-3. Clean white weasel pelts normally sell for higher prices than stained or partially molted individuals.

Relative number of weasels taken by trappers in Oregon during the 2010-2011 season.



Annual harvest of weasels by trappers in Oregon during 1946-2010.



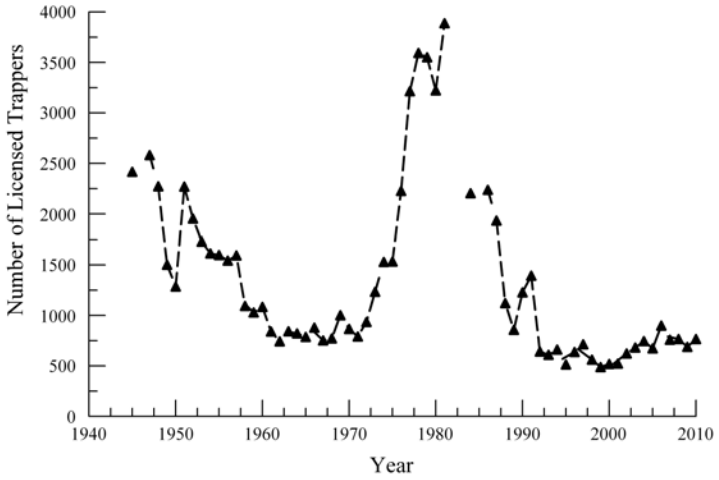
Number of Trappers and Hunters

Available records have shown that the number of licensed trappers in Oregon generally follows that of the national decreasing trend during the past several decades, but also the substantial increase during the fur boom. Post-fur boom numbers are only slightly less than those for pre-fur boom. A high of 3,888 trappers were licensed during the 1981 season. During the 2010-2011 season, Oregon had 766 trappers and 854 furbearer hunters comply with mandatory harvest reporting. The highest number of trappers in western Oregon was in Lane County (40) and in eastern Oregon was in Lake County (77). The highest number of furbearer hunters in western Oregon was in Douglas County (51) and in eastern Oregon was Lake County (77).

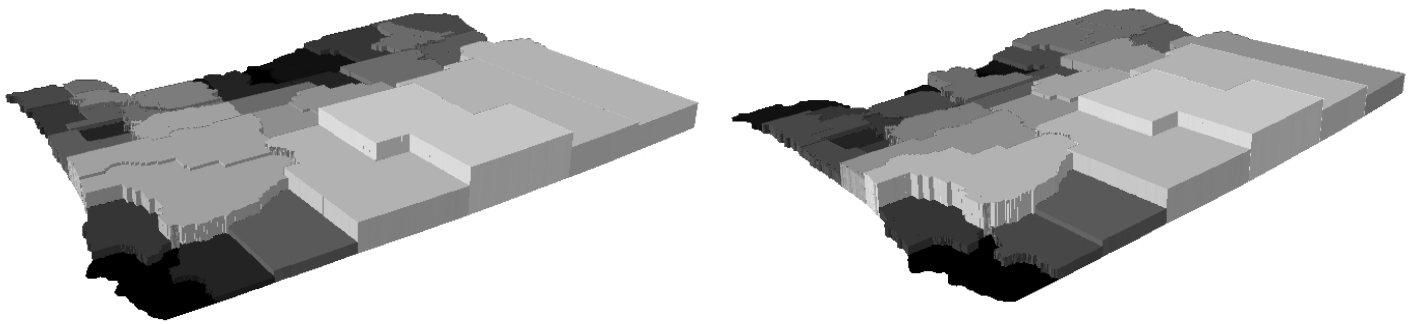
Based on information in the *Ownership and Use of Traps by Trappers in the United States in 2004*, Idaho has approximately the same number of trappers as Oregon, whereas other adjacent states have fewer (California = 19% of Oregon's total, Nevada = 71%, Washington = 17%). In contrast, states with highest number of trappers in their respective regions included New York (10,300), Arkansas (2,443), Michigan (8,454), Utah (4,790), and Alaska (9,108). The total U.S. trapper population in 2003-2004 was estimated at just over 142,000, which is 87% of the 1989-990 estimate in a similar survey published in 1992. Since the survey in 1992, the average age of trappers increased; in 2004, only 3% were under age 25.

According to the national survey, more than half of U.S. trappers sold their fur to a local buyer in 2002. About 4% of trappers pursued their activities outside of their state of residence. Fifty-seven percent trapped primarily on private lands, but this value varies significantly by region and most likely to amounts of public and private lands available. The average number of traps set on a given day during the season was 39, which is down from 49 during the 1992 survey. The average number of days trapped per season was 34. During the past 15 years, trappers were active an average of 9 of those years. Approximately one-third of trappers belonged to a trapper organization. In 1992, the top 4 species of interest to trappers were (in descending order) raccoon, mink, muskrat, and red fox; in 2004, this changed to raccoon, coyote, red fox, and muskrat.

Annual trend of licensed trappers in Oregon during 1945-2010.



Relative number of trappers (left) and hunters (right) in Oregon during the 2010-2011 season.



Other Furbearers

Oregon has several wildlife species that traditionally have been considered furbearers, but have closed seasons and are fully protected in this state because of relatively low populations. Oregon is at the edge of the geographic distribution of several of these species, so some may have never been particularly abundant. Others, however, may have been abundant in the past, but populations were negatively affected by habitat loss, unregulated harvest, and other causes, and are therefore fully protected by State of Oregon and in some instances, federal laws. All of these (at the species level), except the sea otter, have seasons open for harvest in at least 1 other state or Canadian province where such populations can sustain harvest.

Canada Lynx (*Lynx canadensis*)

Canada lynx may very occasionally disperse into Oregon from the north. Currently, Canada lynx in the contiguous U.S. are listed as federally threatened. In many northern portions of their range, Canada lynx undergo cyclic population fluctuations and may be very common during population peaks.

In a letter from ODFW to the U.S. Fish and Wildlife Service in September 1998, during the federal listing decision process, ODFW indicated 17 historic records of Canada lynx:

> "In Oregon, the lynx is very rare and is known from only 17 verified specimens recorded between 1897 and 1993. ODFW records, maintained since 1922, show that four of these individuals were taken during trapping. It is assumed that these animals were taken incidentally during legal furbearer trapping. We are also aware of a few additional sightings of lynx around the state, but these records have varying degrees of certainty. Lynx occurrence records in Oregon are considered to represent animals dispersing from areas further north; these animals are thought to be visitors that immigrate and persist for a period. Occurrences of lynx in Oregon in the past have generally followed peaks in population cycles further north in their range. Further, we do not have any evidence that suggests that self-sustaining breeding populations of lynxes have occurred in Oregon in historic times (B. J. Verts and Leslie N. Carraway "Land Mammals of Oregon", (1998)). The species is considered by ODFW, therefore, as an occasional visitor to Oregon."

Fisher (*Martes pennanti*)

Relocations of fishers into Oregon occurred as early as 1960. A 1961 Game Division report stated:

> "A total of 24 fisher was live-trapped by British Columbia trappers for release in Oregon. Trappers were paid $100.00 for each healthy animal delivered to Kamloops, British Columbia. Eleven of the animals were brought to Klamath Falls by pickup, transferred to helicopter and released at Buck Lake, just south of the Mountain Lakes Wild Area, on January 19 [1960]. The other 13 fisher were flown to La Grande in a U.S. Forest Service plane, transferred to a rented helicopter, and released in the Minam area on March 21. Six of the animals were released at the mouth of the Little Minam and 7 in the Big Burn."

For several years following this relocation effort, fisher sightings were reported, but largely unverified. On April 14, 1977, 2 fishers obtained from British Columbia were released in eastern Douglas County. The following year, 8 more were released in that vicinity.

Other Furbearers (*continued*)

Fisher (*continued*)

Pacific Fisher Conservation

The Pacific fisher was once distributed widely throughout western Oregon, but due to logging and unregulated harvest, the range of the species has been reduced to 2 remnant populations in southwestern Oregon. The Siskiyou population is limited to the Klamath Mountains west of Ashland and south of Grants Pass and retains the original genetic stock native to the area. The Cascades population, located near Crater Lake National Park, was reintroduced by ODFW with stock from the Midwest and British Columbia. Although apparently stable, these 2 populations have not interbred, increased in size, or expanded their range.

The Pacific fisher is currently considered a candidate for listing as a federally threatened or endangered species by the U.S. Fish and Wildlife Service, which means that listing is considered warranted but precluded by other higher priorities. However, the U.S. Fish and Wildlife Service is currently facing 2 separate lawsuits demanding the agency to list the fisher. In response, the agency is moving forward with a work plan that will consider the best available science in the next few years and come to a final decision.

ODFW has participated with the U.S. Fish and Wildlife Service and other federal agencies in planning efforts related to Pacific fisher conversation, and will continue to cooperate with our federal partners.

Pacific Fisher Camera-Trapping

ODFW is participating in a regional effort to document the range and genetics of Pacific fisher throughout the Pacific Northwest. Once widely distributed, the fisher is now limited to 2 distinct remnant populations in the Cascade and Klamath Mountains of southwestern Oregon. ODFW staff in the Rogue Watershed District are using cameras and boxes designed to capture genetic material to explore the area between the Cascade and Siskiyou populations where fisher have not previously been know to occur. The goal is to verify if fisher are moving between the 2 populations and interbreeding.

Kit Fox (*Vulpes macrotis*)

The subspecies of kit fox in Oregon was listed as threatened under the Oregon Endangered Species Act by grandfathering from the Commission's earlier informal list dating from 1975 as *V. macrotis nevadenisis*. In Oregon, the kit fox has always been recognized as peripheral to its range in Nevada and Utah and only occasionally encountered in southeastern Oregon (Malheur and southeastern Harney counties). ODFW has had 2 research-survey efforts, 1 in 1990 by Steve DeStefano; and 1 in 1994 by George Keister. The latter study detected 13 kit foxes in the Burns Junction-Fields area. Museum records from Deschutes and Malheur counties and observations in Klamath, Harney, and Malheur counties, and observations made of a litter from the Nevada-Oregon state-line in 1992 have also been documented.

Captive swift fox, a close relative of the kit fox. Photo by Tim Hiller.

Other Furbearers (*continued*)

Ringtail (*Bassariscus astutus*)

Southwestern Oregon is the northern distributional edge for the ringtail. This species ranges from Oregon to the southwestern U.S. and into southern Mexico. This nocturnal relative of the raccoon is rarely observed and often difficult to monitor at the state level, other than using harvest data in states where harvest occurs.

A harvest season on ringtails was reopened in 1956, apparently after several years of closure, then seasons were closed again some time between 1969 and 1973.

Sea Otter (*Enhydra lutris*)

Sea otters apparently were absent from the Oregon coast for 100 years prior to the release of 29 individuals originating from Amchitka Island, Alaska to Port Orford, Oregon in 1970. Two months post-release, 14 individuals were successfully located, and in 1971, only 2 individuals were found. In June 1971, more sea otters were released, with 40 at Coos Bay and 24 in the original release site at Port Orford. Seven months later, 22 individuals, including 1 kit, were counted at Simpson's Reef. According to the 1971 Game Division report, "We have every reason to believe the plant was a success and that sea otter have been re-established on the Oregon Coast."

The sea otter was listed as threatened by the Commission in 1975 and grandfathered onto the Oregon Endangered Species Act (OESA) in 1987 and remains listed as threatened under the OESA currently. The sea otter was extirpated from Oregon by 1906. The 93 sea otters released in Oregon during 1970-1971 were from Alaska and this effort was considered unsuccessful ("extinct" as stated by U.S. Fish and Wildlife Service in their revised 2003 recovery plan). It has never been certain whether Oregon's "native" sea otters were originally southern sea otters (*Enhydra lutris nereis)* listed under the Federal ESA in 1977, or the Alaskan subspecies (*Enhydra lutris lutris).* An experimental population of the former was established by U.S. Fish and Wildlife Service at Point Conception, CA in 1987. Animals from the experimental population moved north periodically to and just beyond the Oregon state line. Several single animals have been documented since including Yaquina Head in the 1990s and Cape Arago in 1992 and 2003 and various other sightings along the south coast. A sea otter was reported and verified more recently off Depoe Bay in February 2009.

Other Furbearers (*continued*)

Wolverine (*Gulo gulo*)

In 1967, the Oregon legislature classified wolverines as furbearers and the Game Commission promptly provided complete protection for this species. The wolverine was listed as threatened by the Game Commission in 1975, listed as threatened under the Oregon Endangered Species Act in 1987, and reaffirmed as threatened by the Commission in 1989. In December 2010, the North American wolverine became a federal candidate species in the lower 48 states.

In 1936, the wolverine was thought to have been extirpated from Oregon. However, in 1965, a male was killed by a hunter on Three Fingered Jack in Linn County. In 1973, a wolverine was trapped and released on Steens Mountain in Harney County, and in 1986, a wolverine was trapped in Wheeler County. Finally, in 1992, a partial skeleton was recovered in Grant County. There have been other sightings and records of wolverines in Oregon. Dr. Keith Aubrey of the U.S. Forest Service reported that between 1921 and 1950, only 1 wolverine record was verified; the Oregon Biodiversity Information Center database holds 105 records from the early 1970s to the present but these are mostly unverified sightings. Verts and Carraway (1998) considered wolverine observations to be associated with "extreme dispersal events of individuals" and not representative of self-sustaining populations. Aerial surveys undertaken by U.S. Forest Service during 2000-2005 in the Oregon south Cascades (including Crater Lake National Park) and northern California Cascades were unable to find animals or verify tracks in snow. A recent monitoring project, however, has verified presence of wolverines in northeastern Oregon.

Wolverine Detection Project in Northeastern Oregon

Clinton Long and Audrey Magoun, directors of The Wolverine Foundation, Inc., in cooperation with ODFW and U.S. Forest Service, developed a study plan and initiated field work for a pilot study focused on surveying for wolverines in the Wallowa-Whitman National Forest within and adjacent to the Eagle Cap Wilderness using proven non-invasive detection methods for wolverines. From January through June 2011, Magoun and her husband, Pat Valkenburg, deployed motion-detection cameras and hair-snagging devices in the study area and flew aerial surveys to detect wolverine tracks at higher elevations. By the end of June, 3 different wolverines were detected at camera stations, 2 of which were verified as males and photographs indicated the third individual was probably also a male. Analysis of DNA from 1 of the males indicated that this individual was more closely related to wolverines in Idaho than to those in Washington. Aerial surveys detected 7 sets of tracks at high elevations. Arrangements are currently being made to continue detection surveys for wolverines in 2011–2012 in an attempt to find females, particularly females that may be reproducing in the study area. Funding for this project came from The Wolverine Foundation, Inc.; ODFW; Seattle Foundation; Dale Pedersen; and the National Park Service. The U.S. Forest Service provided logistical support.

A wolverine visiting a bait station in the Eagle Cap Wilderness in northeastern Oregon in spring 2011. Photo by Audrey Magoun.

References

Aubry, K. B., M. J. Statham, B. N. Sacks, J. D. Perrine, and S. M. Wisely. 2009. Phylogeography of the North American red fox: vicariance in Pleistocene forest refugia. Molecular Ecology 18:2668-2686.

Bailey, V. 1936. The mammals and life zones of Oregon. North American Fauna No. 55. U.S. Department of Agriculture, Bureau of Biological Survey, Washington, DC, USA.

Csuti, B., T. A. O'Neil, M. M. Shaughnessy, E.P. Gaines, and J. C. Hak. 2001. Atlas of Oregon wildlife: distribution, habitat, and natural history. Second edition Oregon State University Press, Corvallis, Oregon, USA.

Jenkins, S. H., and P. E. Busher. 1979. Castor canadensis. Mammalian Species No. 120. American Society of Mammalogists, Lawrence, Kansas, USA.

King, C. M. 1983. Mustela ermine. Mammalian Species No. 195. American Society of Mammalogists, Lawrence, Kansas, USA.

Lariviere, S. 1999. Mustela vison. Mammalian Species No. 608. American Society of Mammalogists, Lawrence, Kansas, USA.

Lariviere, S., and M. Pasitschmiak-Arts. 1996. Vulpes vulpes. Mammalian Species No. 537. American Society of Mammalogists, Lawrence, Kansas, USA.

Lariviere, S., and L. R. Walton. 1997. Lynx rufus. Mammalian Species No. 563. American Society of Mammalogists, Lawrence, Kansas, USA.

Lariviere, S., and L. R. Walton. 1998. Lontra canadensis. Mammalian Species No. 587. American Society of Mammalogists, Lawrence, Kansas, USA.

Lofroth, E. C., C. M. Raley, J. M. Higley, R. L. Truex, J. S. Yaeger, J. C. Lewis, P. J. Happe, L. L. Finley, R. H. Naney, L. J. Hale, A. L. Krause, S. A. Livingston, A. M. Myers, and R. N. Brown. 2010. Conservation of fishers (*Martes pennanti*) in south-central British Columbia, western Washington, western Oregon, and California. Volume I: Conservation Assessment. USDI Bureau of Land Management, Denver, Colorado, USA.

Long, C. A. 1973. Taxidea taxus. Mammalian Species No. 26. American Society of Mammalogists, Lawrence, Kansas, USA.

Lotze, J., and S. Anderson. 1979. Procyon lotor. Mammalian Species No. 119. American Society of Mammalogists, Lawrence, Kansas, USA.

McManus, J. J. 1974. Didelphis virginianus. Mammalian Species No. 40. American Society of Mammalogists, Lawrence, Kansas, USA.

Poglayen-Neuwall, I., and D. E. Toweill. 1988. Bassariscus astutus. Mammalian Species No. 327. American Society of Mammalogists, Lawrence, Kansas, USA.

Responsive Management. 2005. Ownership and use of traps by trappers in the United States in 2004. 2005. Association of Fish and Wildlife Agencies, Washington, D.C., USA.

Roberts, N. M., and S. M. Crimmins. 2010. Bobcat population status and management in North America: evidence of large-scale population increase. Journal of Fish and Wildlife Management 1:169-174.

Sacks, B. N., M. J. Statham, J. D. Perrine, S. M. Wisely, and K. B. Aubry. 2010. North American montane red foxes: expansion, fragmentation, and the origin of the Sacramento Valley red fox. Conservation Genetics 11:1523–1539.

Sheffield, S. R., and H. H. Thomas. 1997. Mustela frenata. Mammalian Species No. 570. American Society of Mammalogists, Lawrence, Kansas, USA.

Verts, B. J., and L. N. Carraway. 1998. Land Mammals of Oregon. University of California Press, Berkeley, California, USA.

Verts, B. J., L. N. Carraway, and A. Kinlaw. 2001. Spilogale gracilis. Mammalian Species No. 674. American Society of Mammalogists, Lawrence, Kansas, USA.

Wade-Smith, J., and B. J. Verts. 1982. Mephitis mephitis. Mammalian Species No. 173. American Society of Mammalogists, Lawrence, Kansas, USA.

Willner, G. R., G. A. Feldhamer, E. E. Zucker, and J. A. Chapman. 1980. Ondatra zibethicus. Mammalian Species No. 141. American Society of Mammalogists, Lawrence, Kansas, USA.

Woods, C. A., L. Contreras, G. Wilner-Chapman, and H. P. Whidden. 1992. Myocastor coypus. Mammalian Species No. 398. American Society of Mammalogists, Lawrence, Kansas, USA.

Internet Resources

American Society of Mammalogists, Mammalian Species Accounts
http://www.science.smith.edu/departments/Biology/VHAYSSEN/msi/default.html

Association of Fish and Wildlife Agencies, Furbearer Management
http://www.fishwildlife.org/index.php?section=furbearer_management&activator=27

Fur Harvesters Auction, Inc.
http://www.furharvesters.com/index.htm

Internet Center for Wildlife Damage Management
http://icwdm.org/

North American Fur Auctions
http://www.nafa.ca/about

Oregon Department of Fish and Wildlife
http://www.dfw.state.or.us/

Oregon Territorial Council on Furs, Inc.
http://www.wissmiss.com/otcfursales/

Oregon Trappers Association
http://www.oregonta.org/

A coyote in Baker County tries unsuccessfully to capture a small mammal during the early morning hours. Photo by Tim Hiller.

Thousands of raccoon pelts at North American Fur Auctions in Wisconsin ready for the next scheduled auction. Photo by Tim Hiller.

Appendix I

2010-2011 FUR HARVEST OF FURTAKERS REPORTING SUCCESS TRAPPING

COUNTY	TRAPPERS	BEAVER	BOBCAT	GRAY FOX	RED FOX	MARTEN	MINK	MUSKRAT	RIVER OTTER	RACCOON	BADGER	COYOTE	NUTRIA	OPOSSUM	SPOTTED SKUNK	STRIPED SKUNK	WEASEL	TOTAL
BENTON	17	195	20	4	0	0	4	23	14	20	0	67	66	12	4	7	0	436
CLACKAMAS	26	57	20	0	0	0	7	52	7	41	0	23	35	6	10	10	0	268
CLATSOP	14	257	38	0	0	0	1	10	20	18	0	23	49	4	1	1	0	422
COLUMBIA	20	122	17	0	0	0	1	31	3	28	0	19	47	22	3	3	1	297
COOS	13	197	12	4	0	0	35	279	32	116	0	7	29	73	4	47	0	835
CURRY	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
DOUGLAS	36	480	148	37	6	25	10	40	36	159	0	99	244	96	83	87	3	1553
JACKSON	18	11	16	177	0	0	2	79	9	102	0	6	1	60	2	76	0	541
JOSEPHINE	9	59	5	141	0	0	6	237	18	108	0	10	0	45	3	47	0	679
LANE	40	265	94	34	9	2	7	36	61	172	0	46	384	98	97	35	5	1345
LINCOLN	18	115	37	2	0	0	3	8	13	24	0	7	10	13	23	0	0	255
LINN	34	238	82	50	6	0	35	56	28	287	0	315	636	104	21	89	2	1949
MARION	22	143	1	0	0	0	5	66	7	53	0	2	190	6	0	15	0	488
MULTNOMAH	4	9	0	0	0	0	0	3	0	6	0	0	2	10	0	0	0	30
POLK	10	67	6	0	0	0	0	8	2	18	0	8	26	3	0	4	0	142
TILLAMOOK	13	219	38	0	0	0	2	60	29	27	0	29	87	5	2	0	4	502
WASHINGTON	24	146	15	0	0	0	7	217	14	68	0	60	177	25	0	4	1	734
YAMHILL	17	124	1	0	0	0	1	6	5	31	0	1	28	11	0	2	0	210
WESTERN	336	2704	555	449	21	27	126	1211	298	1278	0	722	2011	593	253	427	16	10691
BAKER	18	70	24	0	18	0	0	363	2	6	8	144	0	0	3	26	0	664
CROOK	31	50	60	0	3	0	10	96	5	24	12	237	0	0	0	9	0	506
DESCHUTES	28	16	40	0	5	18	15	29	18	28	2	70	0	0	0	4	0	245
GILLIAM	5	0	7	0	0	0	0	0	0	2	1	18	0	0	0	1	0	29
GRANT	21	39	49	0	0	0	9	134	7	10	13	197	0	0	0	19	4	481
HARNEY	52	4	175	0	18	0	2	15	0	1	35	276	0	0	19	13	3	561
HOOD RIVER	6	14	6	0	0	0	0	0	1	2	0	6	0	0	1	0	0	30
JEFFERSON	22	8	32	0	1	0	1	63	6	13	2	90	0	0	1	10	0	227
KLAMATH	48	46	91	15	0	0	90	4430	19	76	7	87	0	0	6	84	3	4954
LAKE	77	3	248	0	0	0	9	495	0	9	16	125	0	0	6	17	0	928
MALHEUR	46	54	117	0	35	0	18	1041	7	28	78	834	0	0	10	26	2	2250
MORROW	4	10	0	0	0	0	0	3	0	8	10	91	0	0	0	4	0	126
SHERMAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UMATILLA	13	54	21	0	2	0	2	51	7	22	0	17	0	5	0	2	1	184
UNION	23	38	56	0	21	0	25	454	8	39	1	207	0	1	13	36	7	906
WALLOWA	15	30	41	0	20	0	46	263	7	17	3	48	0	0	2	12	0	489
WASCO	10	14	16	0	1	0	0	5	4	4	0	35	0	0	0	23	0	102
WHEELER	11	15	26	0	0	0	0	1	5	0	0	16	0	0	0	3	0	66
EASTERN	430	465	1009	15	124	18	227	7443	96	289	188	2498	0	6	61	289	20	12748
TOTALS	766	3169	1564	464	145	45	353	8654	394	1567	188	3220	2011	599	314	716	36	23439

Appendix II

2010-2011 FUR HARVEST OF FURTAKERS REPORTING SUCCESS HUNTING

COUNTY	HUNTERS	BEAVER	BOBCAT	GRAY FOX	RED FOX	MARTEN	MINK	MUSKRAT	RIVER OTTER	RACCOON	BADGER	COYOTE	NUTRIA	OPOSSUM	SPOTTED SKUNK	STRIPED SKUNK	WEASEL	TOTAL
BENTON	13	1	14	0	0	0	0	0	0	22	0	12	1	3	0	0	0	53
CLACKAMAS	17	0	12	0	0	0	0	0	0	28	0	7	0	0	0	1	0	48
CLATSOP	7	0	14	0	0	0	0	0	0	41	0	0	5	0	0	1	0	61
COLUMBIA	6	0	0	0	0	0	0	0	0	46	0	32	0	0	0	0	0	78
COOS	15	0	50	1	0	0	0	0	0	65	0	0	0	1	0	1	0	118
CURRY	3	1	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	27
DOUGLAS	51	2	167	56	3	0	0	0	1	106	0	38	25	0	0	0	0	398
JACKSON	24	0	40	86	0	0	0	2	4	56	0	27	0	4	0	0	0	219
JOSEPHINE	16	0	14	40	0	0	0	0	3	27	0	2	0	5	0	0	0	91
LANE	39	2	116	1	0	0	0	0	0	58	0	13	16	10	0	0	0	216
LINCOLN	16	0	28	0	0	0	0	0	0	3	0	38	0	0	0	0	0	69
LINN	32	7	47	2	0	0	0	0	0	58	0	20	31	0	0	1	0	166
MARION	15	23	15	0	0	0	0	6	0	45	0	5	25	3	0	1	0	123
MULTNOMAH	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
POLK	10	0	4	0	0	0	0	0	3	4	0	31	21	0	0	0	0	63
TILLAMOOK	17	0	22	0	0	0	0	0	0	44	0	9	0	0	0	0	0	75
WASHINGTON	13	0	24	0	0	0	0	0	0	14	0	5	1	3	0	0	0	47
YAMHILL	18	3	9	0	0	0	0	0	0	57	0	41	0	4	0	1	0	115
WESTERN	313	39	602	187	3	0	0	8	11	674	0	280	125	33	0	6	0	1968
BAKER	24	0	12	1	2	0	0	0	0	8	0	136	0	0	0	0	0	159
CROOK	43	0	61	0	0	0	0	0	0	3	0	95	0	0	0	0	0	159
DESCHUTES	37	0	44	0	1	0	0	0	0	12	1	18	0	0	0	0	0	76
GILLIAM	7	0	5	0	0	0	0	0	1	0	1	12	0	0	0	0	0	19
GRANT	36	0	71	0	0	0	0	0	0	13	1	26	0	0	0	3	0	114
HARNEY	57	0	91	0	2	0	0	0	1	0	88	486	0	0	2	0	0	670
HOOD RIVER	6	1	7	0	0	0	0	0	0	3	0	1	0	0	0	0	0	12
JEFFERSON	22	2	50	0	0	0	0	0	0	11	0	47	0	0	0	0	0	110
KLAMATH	53	0	103	2	0	0	0	0	0	16	1	66	0	0	0	33	0	221
LAKE	77	0	116	1	0	0	0	0	0	0	13	339	0	0	0	0	0	469
MALHEUR	38	2	52	0	17	0	0	0	0	11	7	476	0	0	0	3	0	568
MORROW	16	0	25	0	0	0	0	0	0	3	0	29	0	0	0	0	0	57
SHERMAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UMATILLA	26	1	38	0	2	0	0	0	0	48	5	60	0	0	0	0	0	154
UNION	27	1	49	0	2	0	0	0	0	3	1	57	0	0	0	0	0	113
WALLOWA	26	0	52	0	1	0	0	0	0	4	3	20	0	0	0	0	0	80
WASCO	28	0	78	0	0	0	1	0	1	5	0	104	0	0	0	0	0	189
WHEELER	18	0	31	0	0	0	0	0	0	0	0	25	0	0	0	2	0	58
EASTERN	541	7	885	4	27	0	1	0	3	140	121	1997	0	0	2	41	0	3228
TOTALS	854	46	1487	191	30	0	1	8	14	814	121	2277	125	33	2	47	0	5196

Appendix III:

What Dog-Owners Should Know About Legal Trapping in Oregon

What dog-owners should know about legal trapping in Oregon

Exploring the outdoors is an activity that both pet owners and their dogs enjoy. Owners of both domestic and hunting dogs should be aware of other lawful users enjoying the same area, including regulated trappers during legal trapping seasons.

Trapping is a highly regulated activity in Oregon. Only *furbearers* (animals valued for their fur) that are abundant and can withstand harvest are trapped. Oregon regulations designed to ensure humane treatment of furbearers and other animals make it illegal to use certain traps or certain types of bait associated with traps. By law, all trappers born after June 30, 1968 and all first-time trappers are required to complete an approved trapper education course before obtaining a license.

Traps set for some animals such as coyotes, bobcats and raccoons, can also catch dogs. Following are some tips and information about trapping that will help prevent your dog from inadvertently being caught in a trap.

Please remember that it is unlawful to disturb or remove the traps or snares of any licensed trapper while that person is trapping on public lands or on other land by landowner permission. If you believe a trap or snare has been illegally set, contact Oregon State Police.

For hunting dogs

Hunters should remain in close contact with their birding dogs and carry the tools and knowledge necessary to free their dog from a trap in the unlikely event that their dog is caught. Continue reading for more information on how to release dogs from traps and snares.

For non-hunting dogs

Keep your dog on a leash.

When in areas of trapping activity, the best way to protect your dog is to keep it on a leash. This is especially important for dogs that are not well-trained, but even the most obedient dogs can forget their training in unfamiliar surroundings.

Control your dog.

If you cannot leash your dog, at the very least control it. Do not allow it to wander off in areas of wildlife activity. Remember that most traps are baited with meat and scents that could attract dogs. If your dog is sniffing hard and intent on one spot, it may have located a trap. Call your dog back immediately.

Be aware of where and when trapping activity can occur.

Most trapping activity occurs in the winter because pelts are more valuable at that time. Limited trapping occurs during spring and summer, usually in response to nuisance or damage complaints caused by animals such as raccoons that scavenge from trash cans or nest in attics.

Be aware of where and when trapping activity can occur continued.
Trapping is allowed on most public lands, though sometimes only by permit, and on private lands by permission. However, there are very few traps in relation to the expanse of land so dog-owners are unlikely to encounter traps routinely.

Under seasons set by ODFW, some *invasive* animals (not native to Oregon) and/or predators that cause damage to agricultural crops are legal to trap for the entire year. Examples of animals legal to trap all year are badger, coyote, nutria, opossum, and skunks. More limited seasons that begin as early as mid-October and end as late as March 31 apply for bobcat, gray and red fox, and raccoon.

Regulated trappers are not required to post signs stating traps are in the area as doing so would attract unwanted attention and lead to many stolen traps or traps sprung by those who do not approve of trapping. Entire trap lines have been stolen by thieves moving from flagged trap to flagged trap. However, it is required that all traps be permanently marked with the owner's unique identification number. Oregon State Police rely on those permanent marks to hold trappers accountable for where and how their traps are set.

Carry tools and knowledge to release your dog from a trap.
Traps and snares can injure domestic dogs so knowing how the traps work and how to release your dog from a trap is important. Carry a pair of wire cutter pliers to free your dog in the unlikely event that it is snared when walking or hunting is a good idea. See below for web sites with photos on how to release your dog from the different types of traps used in Oregon.

If you encounter a trap, immediately leash your dog and carefully leave the area.

Types of traps used in Oregon

Following is a description of the types of traps legally used in Oregon. Traps can be either *restraining* traps (designed to hold the animal captive) or *killing* traps (designed to quickly and humanely kill the animal).

Foot-hold traps are restraining traps designed to capture the animal by the foot and restrain it until the trapper comes to remove it. See images at right for examples of such traps and visit the Nova Scotia Dept. of Natural Resources web site for information and graphics on how to release your dog from a foot-hold trap.
http://www.gov.ns.ca/natr/wildlife/doc/PetOwners.pdf

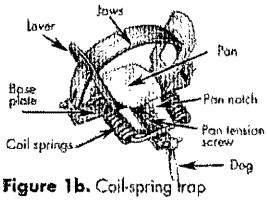


Figure 1b. Coil-spring trap

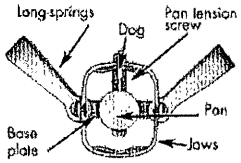


Figure 1a. Longspring Trap

Snares, another commonly used trap, can be either restraining or killing. An animal's movements cause a snare to tighten. Release your dog from a snare by using a wire cutter to cut it free or by pulling the snare in a way to reduce pressure. Visit the Montana Dept. of Fish, Wildlife and Parks web site for more information.
http://fwp.mt.gov/FwpPaperApps/hunting/trapping/trapbrochlegal.pdf

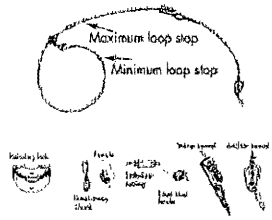


Figure 4b. Non-powered cable device components

Instant-kill traps, or conibears, are designed (as the name suggests) to quickly and humanely kill the trapped animal. If your animal gets caught in a conibear, it is important to remain calm and act quickly. Visit the Wisconsin Dept. of Natural Resources web site for details on how to remove your dog from a conibear.
http://dnr.wi.gov/org/land/wildlife/TRAP/bodygripbrochure.pdf

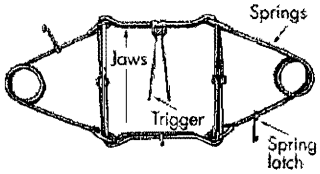


Figure 5. Standard body-gripping trap

For more information about trapping in Oregon, visit
http://www.dfw.state.or.us/ODFWhtml/InfoCntrWild/trappingbackgrounder.htm
or contact ODFW Wildlife Division at (503) 947-6300.