

A Close Look at Mountain Lions

What a ten-year study uncovered about cougars, their kittens, and the effects of heavy hunting pressure. By Sam Curtis and Tom Dickson

This story is featured in *Montana Outdoors*

July-August 2008



In the late 1990s, a small group of Montanans demanded that Fish, Wildlife & Parks reduce the annual harvest of mountain lions, or cougars. They said hunters were killing too many lions, and if the department didn't lower harvest quotas, populations in many areas would rapidly decline.

Unlikely as it might seem, the assertions did not come from antihunting groups, but rather from the lion hunters themselves (known as houndsmen for the dogs they use to chase and tree the big cats). "Houndsmen have a better idea of what's going on with the cat population than anyone, because they're out there chasing them day in and day out," says longtime houndsman Grover Hedrick of Boulder. "In the Bitterroot, as an example, the cats got shot down to about nothing. And all those houndsmen down there drove clear to Helena to say, 'Hey, we don't have any cats left.'"

Long considered a threat to livestock and public safety, cougars were subject to indiscriminate killing for most of Montana's history. Until 1962, the state paid a bounty on each lion killed. But as lion numbers dwindled, the state sought to protect more females and increase reproduction. In 1971, lions were classified as game animals, giving them protection with hunting seasons and harvest quotas. Under regulated seasons, lion numbers grew, helped along by growing populations of deer and elk in the predator's mostly mountainous range of western Montana.

Lion sightings soon increased—in the backcountry and in backyards. In 1989, a lion killed a five-year-old child playing outside the family home, 20 miles north of Missoula. The following year, a youngster was mauled by a cougar in Glacier National Park. From 1990 to 1993, FWP received 77 calls from people in northwestern Montana who felt threatened by lions. Many deer and elk hunters chimed in too, claiming that lions were depleting big game populations.

"FWP was at a loss for what to do," says Rich DeSimone, an FWP wildlife biologist in Helena. "So the department began increasing harvest quotas. We went from a harvest of 159 lions in 1988 to 776 in 1998. That's the highest number ever harvested in one state as a game animal."

Many houndsmen were furious over the high harvest. They still maintained that lions were disappearing and quotas should be lowered, not raised. Yet homeowners continued to call FWP with reports of lions in their yards. Department officials found themselves pinned between two sources of conflicting information, not a place they like to be.

How many to harvest?

One of the most perplexing challenges facing wildlife managers is to figure out how many game animals can be killed each year by hunters—and what seasons, limits, and other regulations to set for obtaining that result. If managers are too conservative, some hunters may lose recreational opportunities and the wildlife population may expand too much. Yet overly liberal regulations may remove too many animals from a population and slow recovery.

To determine the appropriate harvest, wildlife managers need to know how many game animals inhabit a hunting area or, lacking that information, whether numbers are rising, falling, or remaining stable from year to year (known as population trends). A rising population can withstand more hunting; a falling population usually means a lower harvest is in order. Managers also need to know how removal of different ages and sexes affects a population. For example, harvesting females usually lowers a population more significantly than harvesting males. Without this population and harvest information, determining harvest objectives and quotas can be little more than throwing darts at a board.

FWP found itself with darts in hand during the 1990s as it tried to set harvest quotas for Montana's mountain lion populations. Not only was the lack of population data causing conflicts with houndsmen, it also left the state vulnerable to challenges by antihunters. Animal rights groups prevented a proposed lion hunting season in California when that state was unable to prove its annual harvest would not harm populations. And in Washington and Oregon, ballot initiatives

outlawed using dogs for hunting lions. Without strong data showing that its regulated hunting seasons were compatible with healthy lion populations, Montana was similarly vulnerable.

Hunting for cougar information

To gather that information, FWP in 1997 assigned DeSimone to a monumental ten-year mountain lion research project. The study had three main goals: determine how hunting affected lion populations, find ways to measure changes in lion abundance, and learn as much as possible about lion biology and ecology.

To begin its ground-breaking project, DeSimone's research team focused on the Blackfoot drainage east of Missoula, an area typical of hunted mountain lion habitat in Montana. Because they are secretive and elusive, cougars are notoriously difficult to locate. To determine the number of lions inhabiting the study area, DeSimone relied on cougar-finding experts. "We knew that houndsmen and their dogs are very efficient, and that if we hunted the resident lions day after day during winter, we could tree and radio-collar most of them," says DeSimone.

Over the next nine years, research team members captured and radio-collared 121 different lions (24 females, 11 males, and 86 kittens). Some collars contained GPS units that recorded a cat's location every five hours. Each week the team used airplanes to track the lions' movements and home ranges. They documented more than 46,000 different mountain lion locations and gathered extensive data on lion reproduction, mortality, dispersal, and population growth.

Because hunting was allowed in the study area, researchers could see how it affected population, age and sex ratios, and lion movement. DeSimone also compared the hunted population with an intensively studied population of nonhunted lions in New Mexico.

The crew evaluated ways to estimate lion population trends in specific areas. Because they knew exactly how many lions were in the study area, researchers compared the actual increase and decrease of the population each year with several "indirect" methods. One was a phone survey of houndsmen and deer hunters that asked if they saw lions while afield. Another counted the number of lion snow tracks in 150 miles of established winter routes, over which researchers covered 5,000 miles during five years. DeSimone and his team also monitored population trends of elk, mule deer, and white-tailed deer to determine if they corresponded to lion population trends.

The project made even greater gains after 2005, when researchers tested the effectiveness of DNA sampling to estimate lion population size. At the U.S. Forest Service Rocky Mountain Research Station Genetic Laboratory in Missoula, scientists figured out how to identify individual lions by analyzing the DNA in hair and tissue samples. This allowed DeSimone to learn which lions produced the hairs often found on snow tracks. It also meant that houndsmen such as Hedrick, who worked with the research crew during the last five years of the study, no longer needed to capture and handle a cougar to learn its identity. After treeing a lion, they could shoot it with a biopsy dart that extracted a small piece of tissue the DNA researchers could later examine.

The findings

From the decade-long study, DeSimone has gathered vast amounts of information that other FWP biologists say is sorely needed to manage Montana's mountain lions. Among the baseline data the research team collected: number of kittens per litter, age of first reproduction, intervals between births, age when young lions leave their mother, difference in dispersal times between males and females, sex and age ratios, home range size, and changing densities of lions on the landscape. "The information is extremely important, because any time you get into modeling—making predictions about what's going on with wildlife populations based on available information—you need solid data like this to work with," says Jim Williams, FWP northwestern region wildlife manager in Kalispell.

DeSimone cautions that the information has not yet undergone complete statistical analysis nor the comprehensive peer review necessary to make scientific conclusions. However, he can make several general observations from the study. The most significant is that hunting has a major effect on lion populations. "People thought you couldn't really overhunt lions because the animals were too elusive," DeSimone says. "But in our study area, we found that hunting is the number one factor affecting mountain lion distribution and abundance."

On the other hand, the study found that hunting does not seem to alter mountain lion biology. “Compared with a nonhunted population, there weren’t major differences in litter size or age of breeding,” DeSimone says. “What that signifies is that carefully controlled hunting appears to be a viable management tool.” The “carefully controlled” part is important. “We also learned that hunted lion populations were younger, had fewer males, and took a lot longer to recover from declines than had previously been thought,” DeSimone says. “That means we can’t harvest lion populations as heavily as we have in the past.”

According to Mike Thompson, FWP western region wildlife manager, the research project confirmed that high quotas in western Montana during the late 1990s hit lion populations too hard and prevented recovery. “Rich’s study came at the right time, because it demonstrated without a doubt that we had driven lion numbers down below a desired level, and it allowed us to monitor how long and under what circumstances lion populations rebound,” he says.

Another significant finding was that DNA sampling can provide an accurate lion count in a specific area. “We now know that by hiring houndsmen to tree lions and shoot them with biopsy darts, we can find out the exact number of lions in an area,” DeSimone says.

As for the indirect population monitoring, DeSimone says he is still analyzing data to see if using deer hunter and houndsman observations, along with monitoring deer and other prey abundance, might reliably reflect lion population trends. “We’ll probably have to look at several indicators,” says DeSimone. “One thing isn’t going to tell all.”

Science that matters

Now that the study is finished, FWP plans to draft a statewide mountain lion management plan. Based on the study results, the plan will guide future decisions such as harvest strategies and population objectives. “We need to establish objectives for the density of lions we want in different places, and the public needs to be involved,” says DeSimone. “In areas where we have more public land and less livestock, such as in northwestern Montana, we can have more lions and can manage populations at close to their biological potential. In eastern Montana, where lions come into conflict with livestock, we’ll need to manage for fewer lions. And in populated urban areas, we won’t tolerate lions. We hope Montanans learn to live with lions and form some balance with these incredible wild animals.”

DeSimone’s work is already influencing management decisions. In 2006, northwestern region wildlife biologists used the research findings to show how easily lions can be overharvested. As a result, they were able to establish a limited-entry permit system like the one used for moose, mountain goats, and bighorn sheep. “FWP is doing a really good job now,” says Hedrick. “I think this study will probably save the department a lot of legal challenges, because it produced good information that’s hard to dispute.”

Vic Workman, FWP commissioner representing northwestern Montana, says the research results will help guide important decisions he and other commission members must make. “The better the biology and science we have behind decisions affecting hunting and wildlife, the easier it is for us to make decisions and then explain to the public why we made them,” he says.

DeSimone hopes his work will increase the regard that Montanans have for mountain lions. The biologist notes that historically, cougars were the most widely dispersed animal in the western hemisphere—and also the most intensively persecuted. “Fear and hatred of lions run deep in folklore,” he says. “Only relatively recently has the public asked that lion populations receive some type of protection.”

Though an avid deer and elk hunter, DeSimone does not hunt lions. But he respects those who do, as long as they care about the animals. He knows that most houndsmen hunt lions for the thrill of the chase, to see and hear their dogs work, and to witness a cougar’s cunning, speed, and grace. And he knows that some hunters will shoot any legal lion they can, while others will kill only one or two lions of the hundreds they tree during their lifetime. Because the lions in the study area had radio collars and ear tags, local houndsmen who killed a lion often knew it was one DeSimone had been studying

closely for years. “A guy called me one winter and said, ‘Rich, you won’t like what I’m gonna tell you, but I killed one of your big males. But it’s the only one I’ve ever shot, and I did it because it was big enough for the record book.’ And you know, I was okay with that guy shooting that lion. The main thing is I want hunters to care enough about lions to work with us to keep healthy populations around for a long time.” 🐾

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