

WOLF WATCH

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RECOVERY AND MANAGEMENT IN MONTANA

Few species incite more controversy than wolves. People seem to either hate them or love them, with few opinions (or maybe a silent majority) in between.

This has certainly been the case in the northern Rocky Mountains where the reestablishment of the species has been playing out for nearly four decades. It began when wolves crossed the border from Canada and began to settle in northwestern Montana in the late 1970s. This population remained small and relatively stable until about 2005 when it began to grow slowly (Figure 1). Because they colonized northwest Montana naturally, these wolves received full protection under the Endangered Species Act (ESA). The wolf population in the northern Rockies began to change dramatically in 1995 when 66 wolves captured in Canada (the

same species as wolves native to Montana, contrary to some claims) were released in Yellowstone National Park and central Idaho after years of debate and deliberation. The reintroduced wolves established populations that were designated as “experimental, non-essential” under the ESA, meaning that management actions (e.g., removal of wolves that prey on livestock) are allowed as long as such actions are in accordance with the ultimate recovery of the species. These populations that began with a small number of wolves grew very rapidly (Figure 1), becoming sources of dispersers that soon colonized much of western Montana.



The delisting of wolves in the northern Rockies is a convoluted story. The wolf population exceeded the delisting criteria of 300 wolves and 30 breeding pairs divided equally between Montana, Idaho, and Wyoming in 2002. Wolves in the three states were first delisted in 2008, but court battles resulted in a series of injunctions and new proposals to delist that kept the wolf population in regulatory limbo. This continued until 2011 when the U.S. Congress passed legislation that permanently delisted wolves in Montana and Idaho (wolves in Wyoming were delisted in 2012). Needless to say, throughout this process, public and scientific debate was intense. Public concerns about effects of wolves on ungulate populations and the livelihood of stock growers contrasted sharply with beliefs that wolves were a natural part of the northern Rockies ecosystem and their populations should be allowed to thrive. Scientists, in the meantime, debated about just what thriving meant. How large must a wolf population be to be self-sustaining? How connected should wolf

populations be to ensure genetic vigor? What effects do wolves have on prey populations? How much human off-take can a wolf population absorb before it experiences unintended demographic consequences? The truth is that we just don't know the answers to these questions all that well.

Following delisting, resolutions to public debate and answers to ecological questions continue to evolve. States in the northern Rockies have assumed management authority over wolves since they were delisted. Learning about effects of management on wolves is increasing rapidly, providing a lot of insight into just what makes wolf populations tick. The first public harvest of wolves took place in 2009 after the initial delisting. In Montana, limited harvest quotas were set out of an abundance of caution. Those quotas were not met, and the wolf population continued to grow, suggesting the population could sustain more intensive harvest. Hunting of wolves was suspended during subsequent court battles but resumed following final delisting in 2011.

Healthy discourse and debate continues as part of the North American Model where management of wildlife is a public process driven by public ownership of wildlife.

Since resuming wolf hunting, Montana has defined hunting and trapping seasons with the intent to reduce its wolf populations in order to strike a balance between a healthy wolf population and public tolerance. Harvest pressure on wolves has increased incrementally over the years, primarily because the more limited pressure of earlier seasons failed to achieve harvest quotas. Recent, slightly downward trends in population size (Figure 2), however, suggest two (among several) possible scenarios: (1) harvest is proving successful at reducing the size of the population, or (2) the wolf population in western Montana may have hit its carrying capacity and is unable to grow further. We probably won't know which of those scenarios is most likely for quite some time, though.

A fundamental tenet of using harvest to achieve management objectives is understanding the size of the population you're managing. Since reintroduction, the abundance of wolves has been rigorously monitored; first, because it was required under the ESA but more recently because it is needed for effective management and to meet public expectations. While wolves were listed, funding from the federal government enabled intensive monitoring (e.g., capturing, collaring, and radio tracking lots of wolves), allowing a thorough count of wolves and breeding pairs. In the years immediately prior to delisting, however, even that level of monitoring was not able to keep up with growing wolf populations. To make matters worse, federal funding rapidly declined in the years following delisting,

**NORTHERN ROCKY MOUNTAIN WOLF POPULATION TRENDS
IN MONTANA, IDAHO, AND WYOMING: 1982-2014**
(excludes Oregon and Washington)

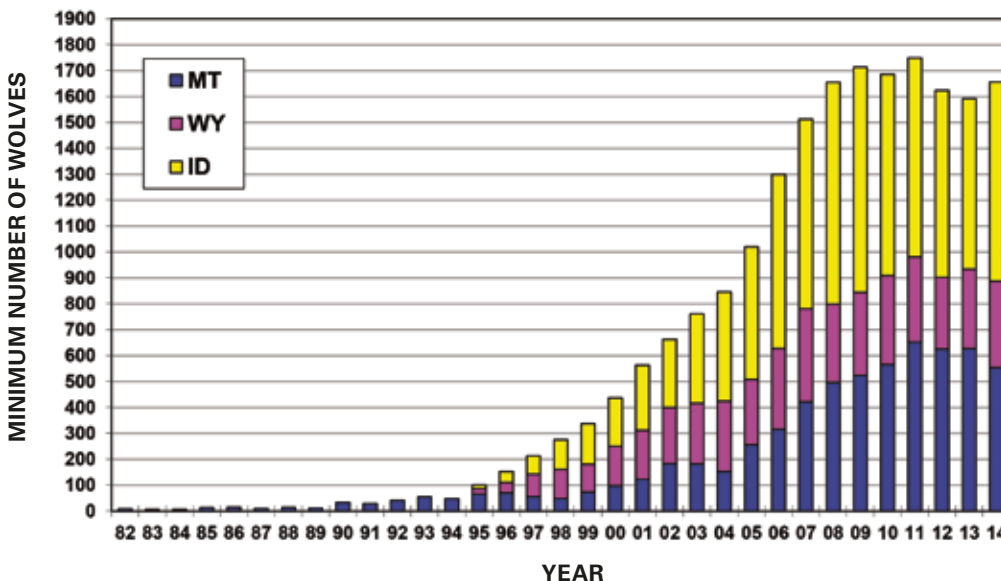


FIGURE 1. Growth of the wolf populations in Montana (MT), Wyoming (WY), and Idaho (ID) from 1982 to 2014. The delisting criterion under the Endangered Species Act of at least 300 wolves and 30 breeding pairs distributed equally across the 3 states was met in 2002. Figure courtesy of the U.S. Fish and Wildlife Service.

SIZE OF THE WOLF POPULATION IN MONTANA FROM 1994 TO 2014

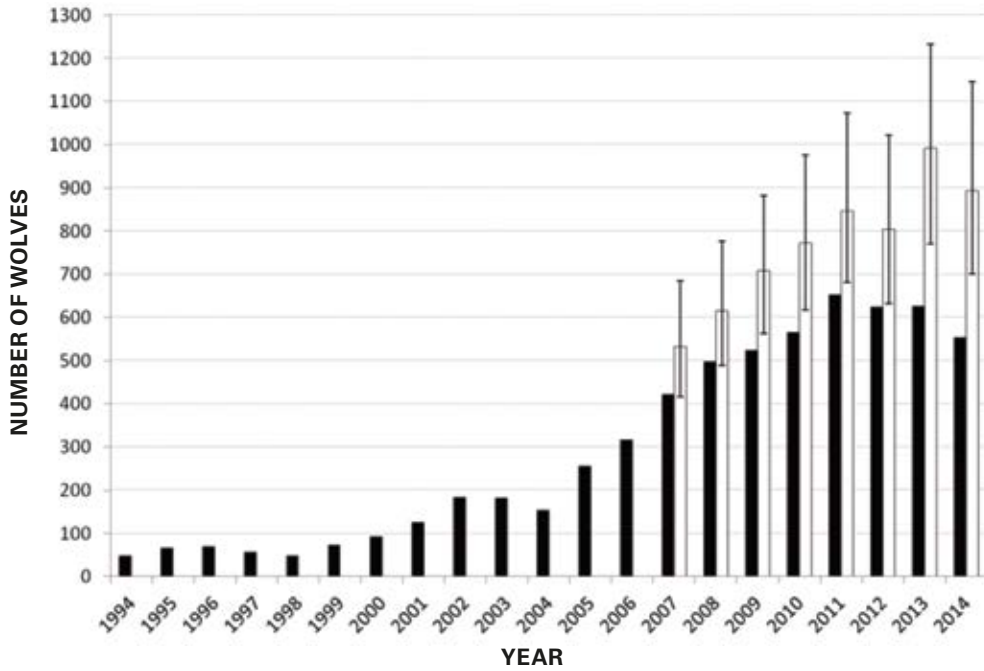


FIGURE 2. Size of the wolf population in Montana from 1994 to 2014, represented by minimum counts observed through traditional monitoring of collared packs (black bars) and abundance estimates derived independently from occupancy models based on hunter observations. Error bars indicate uncertainty associated with estimates. Figure courtesy of Montana Fish, Wildlife and Parks.

strongly limiting the ability of states to understand and manage their wolf populations.

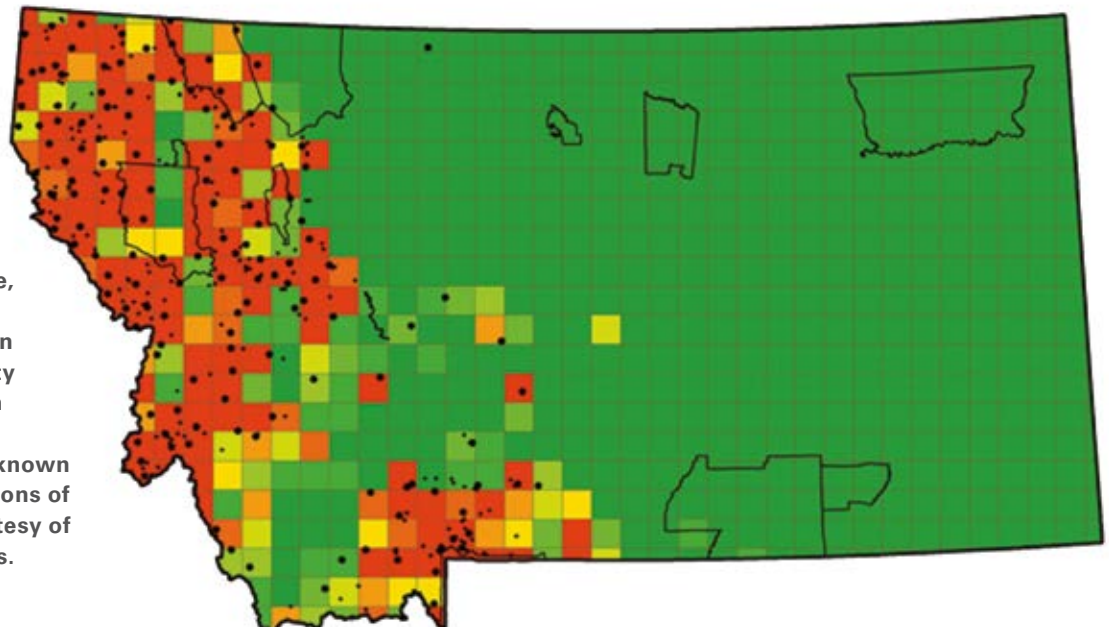
Montana needed another way to monitor its wolves. Large carnivores like wolves are notoriously difficult to monitor because they are elusive and occur at low densities. Previous approaches based on tracking collared wolves were no longer feasible, and alternative methods such as track counts, genetic mark-recapture, and camera trapping would not work on the scale of an entire state.

The Montana Cooperative Wildlife Research Unit had been working for years with the Nez Perce tribe and Idaho Department of Fish and Game on developing a statewide protocol for monitoring wolves based on a statistical methodology called occupancy modeling. In essence, occupancy modeling uses observation data such as wolf sightings within “patches” (actually, cells on a grid covering the entire state) and infer whether cells were occupied or not. Because wolves are

highly territorial and their pack sizes are understood reasonably well, knowing occupancy across a state allows us to estimate abundance (Figures 2 and 3). The approach works well, and it was adopted by Montana Fish, Wildlife and Parks (FWP) in 2007. Figure 2 shows abundance estimates for Montana, developed using occupancy models and the minimum number of wolves recorded using traditional, intensive (but no longer affordable) techniques. A comparison of

the estimates and minimum numbers tells us two important things. First, the greater magnitude of the estimates tells us what we already suspected—traditional monitoring since delisting was not sufficient to detect all wolves. Second, trends were similar for both estimates and minimum numbers, suggesting that the estimates were a reliable indicator of changes in the wolf population. Based on this approach to monitoring, wolf populations in Montana are probably some of the best

FIGURE 3. This map shows estimated statewide occupancy of wolves in Montana in 2012, based on observations of deer and elk hunters obtained by phone survey following the hunting season. Cells within the grid are 600 square kilometers in size, equal to average territory size for wolf packs in Montana. Green shading indicates low probability of occupancy; red indicates high probability. Large black dots represent centroid locations of known packs; small dots indicate locations of legal wolf harvests. Figure courtesy of Montana Fish, Wildlife and Parks.



understood anywhere.

Understanding abundance, however, is only part of the picture when it comes to good management. We also need to know how harvest affects abundance so hunting and trapping seasons that will help meet management objectives can be planned and implemented. This is no easy accomplishment because it can be hard to see relationships between harvest policies and population dynamics due to four sources of uncertainty: (1) environmental variation that influences populations, (2) incomplete understanding of processes within populations that affect growth, (3) limited control over successful implementation of harvest regulations (i.e., the number of tags sold may not equal the number of wolves harvested), and (4) the limited ability of any monitoring program to detect interactions between harvest and population dynamics. The only way to reduce these important uncertainties is over time, through a process called adaptive harvest management (AHM). In essence, AHM is experimentation through management where we might have various ideas about how harvest affects wolf populations, we implement a harvest policy based on these ideas, and then use monitoring to see which of the ideas has greatest support. What we learn from doing this over multiple harvest seasons allows us to improve our understanding of how different approaches to harvesting wolves help—or fail to—achieve management objectives. Collaborative research with Montana FWP to develop an AHM program for wolves is currently underway—so stay tuned!

In the meantime, healthy discourse and debate continues as part of the North American Model where



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management of wildlife is a public process driven by public ownership of wildlife. This discourse ultimately leads to effective conservation of species like wolves, however contentious it might seem in the short term. Interestingly, the tenor and volume of public debate in Montana has decreased considerably since state management began and progress toward management objectives has been

demonstrated. Scientific debate continues apace, however, as researchers seek to discern how human off-take affects wolf populations. Arguably the stakes are high for wolves in the northern Rockies that made the transition from an endangered to a harvested species nearly overnight. The good news is that throughout the recovery in Montana, wolves have proven highly resilient, and rigorous

monitoring and tracking of harvest in real time allows managers to keep close tabs on population health and progress toward management objectives. Through AHM, over time we will better understand both population dynamics of wolves and effects of harvest, allowing managers to best find that sweet spot between healthy wolf populations and their acceptance by the public. ■