

## 2013 WOLF SURVEY FAQs

### HOW ABUNDANT IS MINNESOTA'S WOLF POPULATION?

Minnesota's 2012-13 mid-winter wolf population is estimated at 2,211 wolves. This estimate is below the 2007-08 estimate of 2,921 wolves but remains above Minnesota's minimum mid-winter population goal of at least 1,600 wolves.

### HOW ACCURATE IS THE WOLF POPULATION ESTIMATE?

As is the case with any wildlife population estimate, there is uncertainty in the estimate of the wolf population size. Based on the variation in pack size and territory size from the radio-collared packs this winter, the margin of error is approximately +/- 500, or 1,652 to 2,641 wolves. This interval overlaps the three previous intervals going back to 1998 and may not be statistically different than those estimates. The current point estimate of 2,211 wolves is the biggest change since the DNR started conducting regular surveys and the totality of information supports a conclusion that mid-winter numbers are lower than during the winter of 2007-08.

### WHY IS THE POPULATION ESTIMATE SMALLER?

Compared to data collected during the 2007-08 wolf survey, the biggest changes contributing to a lower population estimate were an increase of 13 percent in average wolf pack territory size (to approximately 62 square miles) and a decrease of 12 percent in the average number of wolves per pack from 4.9 to 4.3. These changes likely are the result of the reduced deer population numbers in northern Minnesota forests, although the average pack size decrease may also have been influenced by wolf harvest immediately preceding the winter wolf pack counts. With 413 wolves harvested and a post-harvest population estimated at 2,211, DNR projects that there were about 2,600 wolves in Minnesota prior to the season or 300 below the estimate from 2007-08.

### WHAT IS THE WOLF'S CURRENT RANGE IN MINNESOTA?

Wolves remain widely distributed throughout Minnesota's forest zone. Information available since the 2007-08 survey indicates that wolf range has expanded in several areas along the southern and western periphery, resulting in an approximate 8 percent increase in wolf range to 36,700 square miles (see map). The area occupied by packs remains similar to 2007-08 at approximately 27,000 square miles.

### HOW DOES DNR COUNT WOLVES?

DNR regularly conducts comprehensive wolf population surveys every four to six years. The survey is not a count of every wolf in Minnesota. Instead, it is a statistical estimate. The process involves first using field observations and habitat models to estimate how much land is occupied by wolf packs in Minnesota. Then, data on average territory size from radio-collared wolf packs is used to estimate how many wolf packs likely reside within that area. Finally, average pack size is estimated from aerial counts on radio-marked packs in winter. The survey provides estimates of how much land is occupied, the number of packs within that area, the average number of wolves per pack and, ultimately, the total wolf population size that winter. Biologists also look at observations from annual

scent post surveys, winter track surveys, verified depredations and wolves trapped in response to depredations each year to monitor population trends between the comprehensive population surveys.

### **DOES DNR CONDUCT ANNUAL MONITORING OF WOLF POPULATIONS?**

DNR and other agencies have collected annual data on wolf population trends since the early 1970s. These annual indices include fall carnivore scent station surveys and winter track surveys that monitor presence of wolves at standardized locations throughout wolf range, wolf depredation indices and radio-telemetry research in smaller study areas. These indices do not provide specific population estimates for the entire wolf population; however, they do provide valuable data for evaluating whether the population is increasing or decreasing between the more comprehensive surveys. In spite of differing methodologies, the data collected by DNR and other agencies has generally provided corroborating assessments of wolf population trends in Minnesota, thereby adding confidence that DNR's monitoring program has been reliable.

### **HOW DID THE WOLF HUNT AFFECT THE POPULATION?**

Because of changes in wolf management this year, the best comparison of the current population to previous wolf population estimates requires consideration of the estimated pre-hunt wolf population in 2012. As with essentially all harvested wildlife populations, the population immediately following a harvest will be lower than just prior to the harvest season. DNR projects that there were approximately 2,600 wolves in Minnesota prior to the season. The harvest of 413 wolves reduced the fall wolf population by about 16 percent below the number of wolves that might have otherwise been present in mid-winter. Any longer-term impacts of a wolf season cannot be evaluated immediately following the hunt but must consider population responses after pups are born each spring.

### **DOES HUNTING AND TRAPPING BIOLOGICALLY HARM THE WOLF POPULATION?**

Minnesota's conservative approach to wolf hunting does remove wolves from the population but adaptive harvest management will ensure that it does not threaten the long-term viability of the population. Many wolves die each year from natural causes (starvation, disease or wolf-on-wolf aggression related to territorial disputes) and anthropogenic factors such as car-kills or depredation take, and a portion of wolves taken by hunters and trappers would not likely have survived regardless of human harvest. As with other harvested wildlife populations, addition of new individuals to the population each year from reproduction or immigration helps ensure the population is sustained through time.

### **WHAT IS THE IMPACT OF WOLF DEPREDATION CONTROL?**

Another factor that played out in 2012 was a higher number of wolves taken for depredation control than in previous years. In addition to reduced prey density, wolf depredation increases have been directly tied to mild winters when wolves have difficulty taking prey. This was the case following the extremely mild winter of 2011-12. In comparison, following the severe winter of 2012-13, when deer were vulnerable, we saw a much different pattern in depredation control of wolves, with only 10 wolves taken through early summer, compared to about 100 taken for depredation control by this time last year.

## **HOW DO DEER AFFECT WOLVES**

Deer are wolves' primary food source in Minnesota. When there are more deer, more wolves can typically be sustained because wolves have access to better nutrition, which directly and positively impacts adult health and wolf reproduction. The reverse happens when there are fewer deer. The lower 2013 population estimate correlates well with the fact that wolves' primary food sources have declined in the forested portions of Minnesota. Since 2008, deer density in wolf range declined 25 percent, and although moose are only a primary prey in a portion of Minnesota's wolf range, the moose population decreased 65 percent. Wolf research has demonstrated a strong correlation between the amount of available prey and the density of wolves. Formulas developed for predicting potential wolf abundance based on prey density alone indicate that the observed decline in prey since 2008 might be expected to reduce the number of wolves by as many as 500.

## **HOW DOES PUP SURVIVAL AFFECT THE WOLF POPULATION?**

Reproduction and wolf pup survival is directly related to nutrition, in essence the number of available prey per wolf. Healthy adults with adequate nutrition can be highly productive. More surviving pups increase the number of wolves in a pack that fall and winter. Within the annual cycle, the wolf population reaches a peak after pups are born and naturally decreases throughout the year, primarily as a result of pup mortality.

## **WHAT CAUSES FLUCTUATIONS IN WOLF POPULATION SIZE?**

Wolf population dynamics are influenced by more than just mortality. Reproduction, immigration and emigration also are important factors in understanding wolf population changes from year to year. For wolves, these influences are strongly tied to their food supply. Current efforts for deer management are to allow for an increase in deer population numbers in much of northern Minnesota, and DNR expects the wolf population to respond positively.

## **HOW DOES MINNESOTA'S WOLF POPULATION COMPARE TO OTHER WOLF POPULATIONS?**

Minnesota has the largest wolf population in the lower 48 contiguous states. The current mid-winter estimate of 3.13 wolves per 100 square kilometers is below that observed between 2003-04 and 2007-08 and likely a result of prey declines and wolf harvest that removed wolves just prior to the timing of the 2012-13 mid-winter population estimate. Nevertheless, current estimated density remains near the upper end of densities reported from other regions of North America where density of self-sustaining wolf populations has been estimated over a larger area.