BALANCING NATURE:

Relationships between predator and prey are never simple. Mexican wolves released in Arizona have adapted their diet, and 80 percent to 90 percent of their diet consists of elk.

Restoring a wildlife species without negatively impacting another

By Jim Heffelfinger and Brian Wakeling

Elk and habitat photos by George Andrejko. Trail camera photos by IFT

Restoring wolves in Arizona has not been easy. Wolves depend on prey, and relationships among predators and prey are never simple. Wildlife biologists are specifically trained to understand these relationships, spending years in classes and studying applied research. Formal training is followed by years of practical application managing wildlife populations while continuing to learn more about the complex relationships among predators, prey and their habitat. Biologists often are asked to explain this intertwined relationship to the media, public or decision-makers that lack this scientific training and experience. Consequently, many people think of predator-prey relationships as the simplistic "balance of nature" where both predator and prey populations reach some sort of harmonious balance. But, does the balance of nature truly exist today in our human-influenced world? Was there ever such a thing? What kind of balance can we expect as we move toward a self-sustaining population of Mexican wolves in Arizona?

This natural balance is considered a long-term average with regular fluctuations of predator and prey populations. Predators require prey for food. As prey declines, predator numbers decline, resulting in more abundant forage that provides cover and nutrition. With predator numbers also low, the stage is set for prey to increase. Prey populations then increase to higher levels and may start to overuse the habitat before predator numbers increase in response to the availability of more food (prey). These are the classic predator-prey fluctuations that biologists study in college and how many view the "balance of nature." Although many perceive this balance exists in nature, it is not so simple. There are times when predators adversely impact prey populations and when prey populations fluctuate independent of predators.

Moving from this general concept to the real world, biologists soon realize that Mother Nature is far more complex, especially when returning a predator like the wolf to a habitat where it has been absent for a long time. Predator-prey relations are complicated by multiple species of prey, competing predators, periods of drought and habitat changes to name a few. During the 60 years since wolves existed in the Southwest, their habitat underwent dramatic change such as wide-spread urbanization and development of a complex road system. Almost none of the changes benefited wolves. Because of these changes, predictions are imprecise on the effects that the reintroduction of wolves will have on other native wildlife. However, insight can be gained from what has occurred in other places in North America where wolf populations have rebounded and from the data collected during the last 14 years of Mexican wolf recovery efforts in Arizona.


GEORGE ANDREJKO


GEORGE ANDREJKO


GEORGE ANDREJKO

Wolves prey on large-bodied hoofed animals. That is their job. Mexican wolves evolved in the Sierra Madre Mountains of Mexico as specialized predators of Coues' white-tailed deer. Elk are not a natural prey source for a Mexican wolf. But wolves are incredibly adaptable like the related coyote. Mexican wolves released in Arizona have adapted their diet and 80 percent to 90 percent of their diet consists of elk. A deer's smaller size may make it seem like an easier meal, but elk are easy to locate in herds, more vocal in the forest and keep fairly consistent daily routines. One elk can also feed a whole wolf pack. Wolves do consume other prey, but they have found that, "Elk. It's what's for dinner."

Wolves are coursing predators, meaning they chase prey, and hunt as a team. One wolf consumes the equivalent of about 16 adult elk annually. Throughout the wolf's occupied range in the United States and Canada, wolf populations are larger and more stable in areas where elk, moose, caribou or dense populations of eastern white-tailed deer exist.

When wolves reoccupied northern Yellowstone, elk were abundant. In 1995, the elk population was estimated at 17,000 animals. By 2010, the population declined approximately 70 percent to about 4,500 elk. While wolves are widely blamed for the decrease in elk, other factors, combined with wolf predation, played a role in the decline. Hunting (outside of Yellowstone's boundaries) and below-average precipitation in the area also influenced elk populations. Wolf numbers increased from zero to more than 100 in northern Yellowstone, and when the elk population plummeted, the wolf population followed until only 38 wolves remained.

Predicting the effects wolf recovery in Arizona may have on deer populations is even more challenging than predicting their effect on elk populations. Arizona's dry climate produces less forage that supports fewer deer. While deer do not account for a significant percentage of the Mexican wolf's diet, deer could be the wolf's primary prey in areas that lack elk. A wolf is estimated to require about 80 deer annually if they consumed nothing but deer. In this scenario, wolves would not eat only deer, but it is clear that Arizona's deer herds would not support the same wolf densities as the Northern Rocky Mountains or the Great Lakes Region in the Midwest. Trying to achieve the same wolf densities at the expense of other native wildlife populations would be negligent wildlife management and unsustainable long term.

The current Mexican wolf population in Arizona and New Mexico is approaching the original goal of at least 100 animals. Elk monitoring to date has not shown a decline in elk numbers, and deer remain more abundant in the White Mountains than in many Arizona desert mountain ranges. Arizona and New Mexico lands can support this number of wolves and contribute to the overall recovery of Mexican wolves in their historical range without detrimental effects on prey populations.

Wolf populations may increase in the future to the point where wolf predation does reduce elk and deer abundance. But, if wolves exert enough influence to dramatically reduce an ungulate population, intervention may be needed to prevent the wolf's prey base from declining to a point where it causes the wolf population to decrease. If a balance between wolf and elk populations had occurred in northern Yellowstone, it may have been possible to maintain greater numbers of both species.

The "balance of nature" probably never existed, even in pristine, undisturbed habitats of the past. Today, roadways, habitat changes, catastrophic wildfires, the increasing frequency of drought, climate change and human development all impact species abundance and the predator-prey relationship. In today's world where human impacts abound, it is naïve to believe that the balance of nature can be left to Mother Nature alone. Wildlife agencies have a responsibility to assist and manage all native wildlife populations in balance and not to the detriment of one. Mexican wolves are no different. The restoration of wolves must not damage the conservation and restoration of other native species. Managing for a sustainable level of wolves, in consideration of how southwestern ecosystems differ from the past and from more productive ones, is the responsible way to help ensure that all native species persist in Arizona into the future.

■ Jim Heffelfinger is the department's game specialist in the Tucson regional office. Brian Wakeling is the department's game branch chief.