Prospects for Mexican Gray Wolf Recovery in the Sky Islands

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On November 1, 1917, the first Mexican gray wolf (*Canis lupus baileyi*) of many to follow was killed by the Federal government in Arizona. The female animal was one of a pair of the diminutive subspecies of the much more widely distributed gray wolf (*Canis lupus*). Typical of their kind, and of the arid and less biologically productive habitat in which they evolved, the two peripatetic animals covered a territory much larger than those of northern, heavier wolves. They ranged from Sonora, Mexico, into the Canelo Hills of southern Arizona, traveling in a regular circuit of about seventy miles that crossed the international border at two places.

The wolf pair had been killing newborn calves, and their tracks were distinguishable by the male's missing middle toe on his right front foot—previously lost to a leghold trap. For that reason, he was particularly trap-wary, and possibly she was also. The pair had avoided poison and attempts to track them down with hunting dogs.

The government hunter assigned to their demise, Stanley P. Young of Oregon, had set up a home two years earlier next to his brother's ranch in the Canelo Hills, and after a stint with the Forest Service, gained employment with the U.S. Bureau of Biological Survey in October 1917. This was his first assignment, one that directly benefitted his brother's business. He started off tracking the wolves to learn their habits.

On most of their route, the wolves' trail ranged too widely—from a few to dozens of yards in width—for Young to be able to set traps accurately. In addition, much of their trail also was used by free-ranging cattle and by cowboys, and the traps would not likely stay unsprung long enough to catch the wolves. But finally Young discovered a spot at a 6,000-foot-high pass in the Canelo Hills where the animals detoured for about thirty feet from their main route to a flat limestone rock, from which they could rest while observing the San Rafael Valley below. At the spot where the wolves stepped from the ground to the rock, on or around his twenty-eighth birthday, October 30, Young placed two traps.

The wolf pair was always suspicious of new odors on the trail, particularly scent posts seemingly established by strange wolves. (A scent post is a bush or other upraised feature where the dominant wolf in a pack habitually urinates to mark his territory.) But nothing alerted the female wolf to the trap beneath the soil as she approached the rock. As the steel teeth bit into her foot she lunged away, pulling the trap (attached to eight feet of quarter-inch linked chain) with her and yanking a foot and a half long steel stake pin out of the ground. Pulling these behind her, she ran two hundred yards into the thick cover of manzanita bushes, and then stopped to bite at the trap, seeking freedom and respite.

When Young returned to the spot on November 1, 1917, he saw that the trap was sprung and missing. Though he could have tracked the wolf on his own, he went back to the valley and returned with two ranchers and their hounds. The dogs tracked the wolf into the nearby thicket. The wolf, trailing the chain and pin, scrambled nearly five hundred feet up a ridge and then down into a creek bed, running down a rocky gully crowded thick with vegetation. Each time the dogs got close, she turned on them and snapped, leaving no doubt that even handicapped she could defend herself ably. After five miles, she reached the open valley and kept running. Every time she leaped, the steel stake swung around and hit her in the flank. Still, she was alive and escape seemed possible. But Young and the ranchers followed the hounds on horseback. After more than a mile of pursuit in the valley, they gained on the wolf and her seven pound encumbrance. She could not keep ahead of the galloping horses, and as they came upon her Young ended the wolf's travail with a shot from a .38 caliber Colt revolver.

Young was proud of his achievement. But he still wanted the male wolf, the more trap-wary animal. Seventeen days later that animal returned, and from following his distinctive track Young surmised he was searching for his lost mate. In anticipation, Young had collected the dead female's urine, ground up her gall bladder and her anal glands, and combined these elements into an odiferous tonic. This he sprinkled on a scent post right at the point where the wolf trail had detoured to the fatal rock outcropping. The male wolf, his caution overpowered by longing, stepped into another trap at that spot (Young, no date).

Stanley P. Young's proficiency in this endeavor presaged a wider competence in bureaucratic procedure and intrigue that catapulted him into the most instrumental figure within the Biological Survey and helped ensure its single-minded attention to its war on predators and rodents. Through traps and through poison the agency eliminated all breeding wolves in the Western United States by the early 1930s, though a few lone animals still survived and others roamed up from Mexico and down from Canada. To address the potential of "re-infestation," beginning in 1950 the U.S. Fish and Wildlife Service, successor to the Biological Survey, began sending American salaried personnel and poison to Mexico to duplicate this program south of the border. (And Young traveled to Canada to attempt the same for that nation.)

The agency's success can be measured by the fact that after this extermination program was finally reigned in through President Richard M. Nixon's signing of the Endangered Species Act on December 28, 1973, only five Mexican wolves could be trapped alive in Mexico for an emergency

captive breeding program intended to stave off extinction and provide animals for later reintroduction. Although Roy McBride, the Fish and Wildlife Service hunter who captured these last wolves between 1977 and 1980, estimated that perhaps as many as fifty more survived in Mexico, none has been confirmed since then and the subspecies was presumed extinct in the wild until reintroduced to the United States in 1998 (McBride 1980).

The reintroduction to the Apache National Forest in Arizona and the Gila National Forest in New Mexico took place largely outside the long recognized historic range of the Mexican gray wolf. Current policy, and subsequent agency actions, may dictate that the Mexican wolf not be allowed to roam its historic range—the Sky Islands region—in the United States.

The original taxonomy of gray wolves was elucidated by Major E. A. Goldman of the U.S. Fish and Wildlife Service in 1944, in *The Wolves of North America*, co-authored with Stanley P. Young (Young and Goldman 1944). The agency retained many of their victims' skulls and pelts for comparative examination, and on that phenotypic basis Goldman drew the line that delineated the northern range of *C. l. baileyi*—at the Gila River in Arizona and New Mexico. His analysis and subspecies boundary line was confirmed in 1959 by E. Raymond Hall, Ph.D., of the University of Kansas (Hall and Nelson 1959), the most prodigious academic mammalogist in the twentieth century and an indefatigable and effective opponent of the predator extermination program from 1928 until his death in 1985. (His congressional testimony helped delay for over a year passage of the 1931 Animal Damage Control Act, which gave sanction and authority for the program to continue, and in 1967 he succeeded in ending the program in his home state of Kansas.)

Most of the United States portion of that agreed upon range for the Mexican wolf consists of the Sky Islands and the Chihuahuan and Sonoran Desert surrounding them. But the 1982 Mexican wolf recovery plan suggested releasing the progeny of the remnant members of *baileyi* into the ranges of two extinct Southwestern subspecies, *C. l. monstrabilis* and *C. l. mogollonenis*, where existed larger tracts of roadless habitat—and where some degree of genetic intergradation would have naturally occurred. After they were exterminated, at various times in the twentieth century dispersing *baileyi* individuals from Mexico had traveled into their ranges, demonstrating that *baileyi* could survive in these regions (USFS 1982). (It is worth noting that the several-hundred mile maximum recorded dispersal distances of wolves is largely an artifact of their extirpation from vast regions; it is likely that prior to extirpation wolves generally dispersed much shorter distances before finding mates and settling down, hence limiting the extent of genetic mixing between regions and allowing the evolution of subspecies.)

The recovery plan cited a 1980 paper by biologists Michael A. Bogan, Ph.D., and Patricia Mehlhop, Ph.D. (1980), suggesting these other subspecies could in fact be attributable to *baileyi*, but took no position on their proper assignation, merely stating that the "additional room provided by the Bogan and Mehlhop assessment" would help the team find "suitable wolf release areas." The expansion created a new northern boundary that encompassed the Mogollon Plateau in Arizona and the southern half of New Mexico, along with most of Texas—thousands of square miles that had not originally been regarded as the range of *Canis lupus baileyi.*

In 1986, another Fish and Wildlife Service taxonomist, Ronald M. Nowak, affirmed the original northern range boundary for *baileyi* (and extended it to the east), but nonetheless endorsed placement of Mexican wolves outside their historic range in the interests of providing them habitat where conflicts with livestock interests could be minimized and the wolves' protection could be maximized. In 1992, a DNA study indicated that Mexican wolves were markedly different from all other North American wolves—but could not assign a specific boundary to their unique assemblage of genes (Wayne and others 1992).

The 1996 Final Environmental Impact Statement for the proposed reintroduction, and the 1998 Federal Register notice approving it, established a Mexican wolf population area designated under the experimental, non-essential clause of the Endangered Species Act, whose northern boundary is Interstate 40 and southern boundary Interstate 10—in essence extending the 1982 recovery plan's range of possible release areas dozens of miles northeastward and outside the historic range of *C. l. monstrabilis*, the subspecies which Bogan and Mehlhop had attributed to *baileyi* and which Nowak had attributed to the Great Plains wolf, *C. l. nubilus*. This created a boundary line approximately 200 miles north of the most widely accepted subspeciation boundary at the Gila River, in recognition that a reintroduced population was likely to send dispersers considerable distances. Within this broad region, the reintroduction would take place in a recovery area comprising the Gila and Apache National Forests. About 80% of this recovery area was originally identified as the range of *mogollensis* (and 20% in *baileyi*'s old range). Through this official range re-assessment, the "Mexican gray wolf" was redefined as a subspecies that also inhabited part of northern New Mexico and Arizona.

Even as official range maps for *baileyi* twice skipped northward, the reintroduction program run by the Fish and Wildlife Service under authority of the Endangered Species Act ensured that Mexican wolves would not be allowed to return to the Sky Islands. At the insistence of ranchers and State game agencies, the Federal Register notice for the program required the Federal government to kill or capture wolves who establish territories outside the official recovery area on the Apache and Gila National Forests, even if the wolves are on other public lands (although wolves would be allowed to exist on private and tribal lands where their presence was specifically requested) (Federal Register 1998).

In June, 2001, a panel of four independent biologists, led by Paul C. Paquet, Ph.D., of the University of Calgary, Alberta, issued an 86 page report that had been contracted by the Fish and Wildlife Service as the official three-year review of the reintroduction program. The Paquet Report urged rescinding this provision of the regulations and allowing wolves to roam freely, unless they were causing a tangible problem (Paquet and others 2001). The Fish and Wildlife Service has not revised the rules, and as the scientists suggested was likely to occur,

the wolf population has not met subsequent demographic targets—largely as a result.

Another measure by the same agency threatens to enshrine the absence of Mexican wolves from the Sky Islands into the broader recovery plan governing the species' future. On April 1, 2003, the Fish and Wildlife Service created the Southwestern Gray Wolf Distinct Population Segment (DPS), extending from (and including) Mexico to Interstate 70 of northern Colorado and Utah. In so doing, the agency replaced a previous rule that assured that subspeciation would be considered in gray wolf recovery planning (Federal Register 1978, 2003). A DPS is a unit of listing under the Endangered Species Act, and FWS has appointed a new recovery team to develop de-listing criteria for this DPS.

The DPS's northern boundary is hundreds of miles north of the 1996 line that itself already represented two steps beyond *baileyi*'s originally conceived range. The DPS encompasses the historic range of five originally conceived gray wolf subspecies: *baileyi*, *monstrabilis*, *mogollensis*, *nubilus*, and *youngi.* (The latter is the Southern Rocky Mountains wolf named for Stanley P. Young, who had moved from Arizona to Colorado to oversee exterminating wolves there.) But among these, because of the late date at which the Fish and Wildlife Service began extermination activities in Mexico, only *baileyi* survives. Because it includes such a broad region, the configuration of this DPS undervalues the genetic uniqueness and the specialized evolutionary course of *bailey*. And since Fish and Wildlife Service policy requires that designation of DPS's is to be based on, among other factors, the "physical, physiological, ecological or behavioral" differences "from other populations of the same taxon" (Federal Register 1996), the designation of this DPS can be interpreted as an act of biological gerrymandering. (Its designation is being challenged in Federal court by a coalition of seventeen conservation organizations.)

From Goldman to Nowak, phenotypic analyses of *baileyi* stressed the striking differentiation of these wolves even from their immediate neighbors, whether depicted as mogollonensis or nubilus. Goldman wrote, "In southeastern Arizona and southwestern New Mexico, baileyi intergraded with mogollonensis. Although wolves are known to wander over considerable distances, the transition from baileyi to mogollonensis is remarkably abrupt" (Young and Goldman 1944: 471). Nowak wrote: "I have long been impressed by the tendency to small size shown by gray wolves of Mexico and the border region. A complete gray wolf skull found at a late Pleistocene site in Nuevo Leon is the smallest of any adult North American C. lupus that I have seen." This evidence of uniqueness is corroborated in the genetic record.

That is not to gainsay a certain degree of arbitrariness in original assessments boundaries, because of course there was genetic interaction along the fringes. Nevertheless, the abrupt phenotypic changes in the gray wolf cline correspond to striking differences in other life forms precisely where the originally conceived boundary between *baileyi* and *mogollensis* occurs. The prey base in *baileyi*'s range in the United States (as recognized by Goldman, Hall, and Nowak) included collared peccary (*Pecari tajacu*), also known as javelina, and Coues white-tailed deer (*Odocoileus virginianus couesi*), both species among the smallest of ungulates anywhere, and historically limited at their northern extent to the Sky Islands region. Conversely, there were few or no elk historically known in this original range; the southernmost extent of elk is thought to have terminated where the mountains met the desert.

The differences in prey base along this line is also reflected in a significant difference in habitat. In 1992, the Arizona Department of Game and Fish published a "Summary of Information on Four Potential Mexican Wolf Reintroduction Areas in Arizona." The Department looked at four regions—one of them the Blue Range where wolves were eventually reintroduced and the other three comprising the Sky Islands of Arizona—and listed their attributes for wolves. The three Sky Island areas (plus a few hundred thousand acres in New Mexico) more or less correspond to the original United Statees range for *baileyi* and together comprise approximately 7.5 million acres. (Precise acreage is difficult to ascertain because two of the three overlap each other.)

The Sky Islands contain approximately 1,159,000 acres of Chihuahuan and Sonoran desertscrub (around 15% of the total), 4,552,000 acres of semidesert grassland (61%), 1,521,000 acres of Madrean evergreen and interior chaparral (20%), 97,000 acres of Petran montane conifer (1%), and 3,812 acres of Petran subalpine conifer forest (0.05%—a precise figure because the area of overlap does not include this vegetation type). The Blue Range (not including the New Mexico portion of the current recovery area) includes 26,000 acres of Petran subalpine conifer forest (3 percent of its total), 577,000 acres of Petran montane conifer (57%), 251,000 acres of Great Basin conifer (25%), and 73,000 acres of Madrean evergreen and interior chaparral (7%) (Johnson and others 1992).

Canis lupus baileyi is successfully adapting to the Apache and Gila National Forests, even though most of this recovery area lies outside *baileyi*'s evolutionary bailiwick. It may be instructive to view the Apache and Gila, thus, as a substantial portion of the region of intergradation between Mexican wolves and northern forms—whether they are regarded as Southern Rocky Mountain wolves, Great Plains wolves, or the forms originally identified by Goldman. What the Blue Range principally has in common with both the Southern Rocky Mountains and the Sky Islands is Petran montane conifer vegetation associations.

The very uniqueness of the Sky Islands region in habitats and prey base, which presumably helped shape *baileyi* into the wide-ranging, small creature it is, threatens to prove the rationale for omitting it from future recovery considerations. Because the Southwestern gray wolf DPS includes most of the Southern Rocky Mountains of Colorado, a region of high ungulate density and thus ideal for wolves to exist in small home ranges, a decision to introduce *baileyi* in the Southern Rocky Mountains may make it seem less urgent to secure its recovery in the only United States portion of its original range, where aridity has dictated a lower vegetative fecundity and corresponding lower density of ungulates.

The bureaucratic legerdemain represented in the DPS's configuration spanning many subspecies' ranges undermines the very reason that the Endangered Species Act articulated a basis for listing (and recovering) not just species, but

subspecies and distinct populations as well. For the purposes of developing a recovery plan for *Canis lupus baileyi*, a different task than developing such a plan for the Southwestern DPS, one might consider how subspeciation and regional differences developed in the face of gray wolves' tremendous vagility—and that question might reasonably lead to a consideration of the purposes of the Endangered Species Act.

There is little doubt that Mexican gray wolves would adapt to Colorado, as would Northern Rocky Mountain gray wolves from Yellowstone National Park. But there is more at stake. The Endangered Species Act is intended to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved." Putting Mexican wolves in Colorado should not come at the expense of allowing them to recover in the habitats in which they evolved along the United States-Mexico border. The diminutive Coues white-tailed deer deserves the predator which graced it with dashing speed. The javelina should not be cheated of the reason for its inch-long tusks and occasionally aggressive disposition. And the Sonoran desert itself, crowded with thick, sharply-attired and potentially dangerous vegetation, should have as one of its crowning unintended consequences the presence of a wolf small enough to navigate it with ease—just as it did in 1917 when two lobos trotted through the cooler uplands of the Canelo Hills.

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