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Coyotes Nipping At Our Heels: A New Suburban Dilemma

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Abstract: In the 1970s, coyote attacks on humans in urban and suburban environments began to occur, primarily in Southern California. Such attacks have increased in number, and since the late 1980s coyote attacks on people have been reported from at least 16 additional states and 4 Canadian provinces. Attack incidents are typically preceded by a sequence of increasingly bold coyote behaviors, including attacks on pets during daylight hours. In suburban areas, coyotes can habituate to humans as a result of plentiful food resources, including increased numbers of rabbits and rodents, household refuse, pet food, water from ponds and landscape irrigation run-off, and intentional feeding. Cessation of predator control has also contributed to coyotes' loss of wariness toward humans. Preventive (e.g., habitat modification) and corrective actions (e.g., hazing) can be effective if implemented before coyote attacks on pets become common. However, if environmental modification and changes in human behavior toward coyotes are delayed, then removal of offending coyotes is needed to resolve threats to human safety. Coyote attacks on humans in suburbia are largely preventable, but the long-term solution of this conflict requires public education, changes in residents' behavior, and in some situations, the means to effectively remove individual offending animals.

Key Words: *Canis latrans*, coyote, coyote behavior, coyote-human attacks, human safety, urban coyote

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Introduction

Throughout most of the history of humankind's interaction with coyotes (*Canis latrans*), conflicts have revolved around the issue of predation on livestock, particularly sheep and goats. Indeed, most applied research concerning coyotes and coyote management in the last 30 years has dealt with assessing coyote predation impacts to livestock, and the means either to prevent or reduce such damage, particularly in Western North America (see the *Literature Cited* section in Knowlton et al. 1999).

One constant theme in discussing coyotes and their relationship to the environment is their enormous adaptability. Many authorities consider the coyote prior to the 18th Century to have been primarily an animal of the open plains or short-grass prairies (Young and Jackson 1951, Gipson 1978, Parker 1995). However, by the middle of the 20th Century, coyotes had spread northward into most of Alaska and across much of western and central Canada, and southward through Mexico and into Central America. They remained largely absent, however, in the U.S. east of the Mississippi River (Young and Jackson 1951). However, by last part of the 20th Century, coyotes had become established in all of the contiguous 48 states (Parker 1995). Reasons given for their phenomenal range expansion, other than their adaptability, include human activities such as introduction of livestock, clearing of forests, extermination of wolves (which will compete with and kill coyotes), and alteration of habitats in ways that provided improved access across natural geographical barriers, and even intentional introductions by hunters. This range expansion occurred within essentially the same period that coyotes in many localities were being trapped, shot, poisoned, snared, and otherwise harassed in efforts to limit livestock depredation.

Widely regarded as an opportunistic species in terms of their food habits and behavior, coyotes in some circumstances will habituate to the presence of humans and human-associated food resources. Perhaps one of the first published descriptions of "habituated" coyotes was a report in Young and Jackson (1951:69), where they relate a 1947 report from Yellowstone National Park in which park staff described two coyotes that were habituated to tourists. Park rangers noted that while in the past, park visitors "were lucky to even see a glimpse" of a coyote, now two coyotes were extensively observed begging for food and posing for pictures, causing tourist traffic jams along the main park highway... an occurrence "until now unheard of in Yellowstone's colorful history."

Intentional feeding of coyotes (and other wildlife, such as bears) by park visitors is likely a principal cause of the predators losing their fear of humans. People also unintentionally provide food to wildlife: campgrounds or public use areas in parks often provide easily available food items, either from careless storage of foods or from garbage containers that are not animal-proof or are full to overflowing.

Coyote Attacks on Humans

A series of aggressive encounters of “habituated” coyotes and suburban residents in Southern California, including the first known fatality from a coyote, was described in a paper by Howell (1982). He provided details of encounters in which at least 8 persons were attacked by coyotes in Los Angeles County from 1978 to 1981; the fatality was to a 3-year-old girl attacked in the front yard of her home in a Glendale, CA residential area. Howell noted reports of aggressive coyotes in Los Angeles County attacking adults and children, as well as preying on neighborhood dogs and cats, over a 12-year period beginning about 1970. Subsequently, Carbyn (1989) published accounts of coyote attacks on children, citing incidents that occurred in National or Provincial Parks, mostly during the 1980s. Of the 14 attacks he reported, 4 resulted in “major injuries” to small children. He concluded that these 4 serious attacks were predatory in nature: “Coyotes appeared to have lost fear of humans and regarded the children as prey” (Carbyn 1989:445). He further noted that coyote habituation, which he believed led to attack behavior, “has been widespread in national parks and urban areas where this predator associates humans with food at campgrounds”.

Attack Data from California

Baker and Timm (1998) summarized coyote-human safety incidents from 1988 through 1997 in California involving 53 individuals in 16 locations, in which 21 individuals suffered coyote bites. We provided detailed case histories on 13 incidents or clusters of incidents, while noting that more than 32 other individuals experienced human safety incidents with habituated or aggressive coyotes during this same period. Six years later, Timm et al. (2004) were able to document 89 coyote incidents from California during the period 1978 through 2003, of which 48 had occurred from 1998 through 2003, indicating an obvious increase through time (Figure 1). Most incidents occurred in Southern California near the suburban-wildland interface, with the largest number of incidents occurring in Los Angeles, Orange, and San Diego Counties. None of the incidents we report involved coyotes that were shown to be rabid. Examples of coyote attacks on humans from our Southern California data set include the following:

- Pomona, CA, April 23, 2001, 4:30 pm: A 54-year-old woman fought, using an axe handle, with a large coyote that had attacked her small poodle in her back yard. She received bites and/or scratches on her leg in the melee, and despite her efforts, the coyote killed the poodle and jumped over the fence carrying the carcass. A coyote had previously killed 3 cats as well as a neighbor’s dog. Wildlife Services officials responded to the incident and shot what they believed was the offending coyote. However, the woman underwent post-exposure rabies treatments.
- Griffith Park (Los Angeles, CA), July 20, 1995, 4:00 pm: A coyote approached people in the park, and was chased away from the area at least once. It then returned to attack a 15-month-old girl wearing a jumpsuit. The toddler suffered 7 puncture wounds to her right thigh (through her clothing), along with bruises and scratches. The coyote attempted to carry the child away, before her mother was able to rescue her. This was one of 6 coyote incidents occurring in Griffith Park between March and July 1995, in which coyotes attacked and or bit children or adults. Five adult and 3 subadult coyotes, comprising 2 family groups, were removed by a private pest control firm, and no further incidents occurred in the park.
- Simi Valley, CA, June 6, 2004, 7:00 pm: A coyote grabbed a 3½-year-old boy, playing in his yard, by his head and neck and tried to drag him away. His mother rescued the boy, but injuries to his head and face required 13 stitches. The same coyote had attacked two boys (ages 2 and 3) in their back yard, and then an 8-year-old boy playing street hockey, on adjacent properties in the same

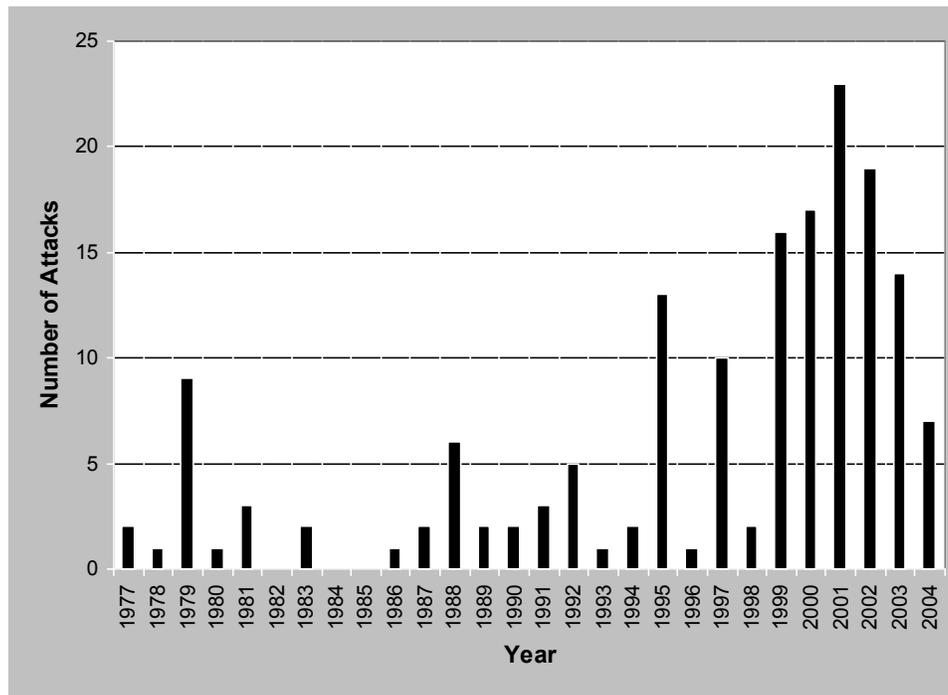


Figure 1. Number of reported coyote attacks on humans in California, 1977 through 2004.

neighborhood, within a 15-minute period preceding this attack. The coyote was located and shot by police. County animal control personnel subsequently determined that a number of coyotes in the neighborhood were being intentionally fed by night-shift guards at this gated community.

More recently, Timm et al. (2005), via increased access to newspaper reports through Internet searches of NewsBank and LexisNexis databases, were able to find additional reports of coyote attacks on humans from the last 3 decades. We reported in excess of 160 human safety incidents in California involving coyotes since the early 1970s. However, we know that this most recent data set is incomplete: some incidents are never reported to authorities, some agencies or entities that receive such reports do not share this information with researchers or others, and some reports are discarded after a few years or are not maintained in a manner that is easily accessible.

Since publishing our summaries of coyote attack data, we have received criticism from representatives of animal welfare and animal protection groups, who have stated that we have exaggerated the risks that urban coyotes pose to humans, and in doing so have created unnecessary fear of coyotes in people (see Fox 2006). However, our definitions of what constitutes an “attack” or a human safety threat are consistent with current practices within California. Under provisions of “Proposition 4”, the 1998 anti-trap initiative approved by voters, padded foothold traps (i.e., Number 3 Victor SoftCatch[®] or similar), can be used to capture coyotes only when a public health or safety emergency exists (Secretary of State 1998). A determination of whether a human health or safety emergency exists is made by the California Department of Fish and Game or by USDA Wildlife Services, depending on the circumstances of each incident.

From our most recent data set of coyote incidents from 1977 through 2004, our analysis determined the following trends:

- 74% of coyote attack incidents occurred in the last decade (1995 through 2004)
- Injury to one or more persons occurred in 78 of 165 attack incidents
- 51% of the persons sustaining injury were adults or teenagers
- 23% of all coyote attacks were associated with the presence of pets (primarily dogs); that is, humans encountered aggressive coyote behavior toward dogs that were being walked, and in some cases people sustained injury in the act of attempting to rescue their pets from coyote attack.

We also looked at the season in which attacks took place, in an effort to evaluate Carbyn's (1989) idea that such attacks, especially on children, are primarily predatory in nature. We noted that attacks were more common during May through August (Figure 2). This corresponds with the season when adult coyotes' food demands would be highest, as they are provisioning pups at this time of year. However, coyote pairs with pups are also likely to more aggressively defend territory and den sites during the reproductive and pup-rearing seasons. Further, likely confounding effects are the tendency of people to be more active out of doors during late spring and summer, and the increased presence of children playing in yards and neighborhoods during summer vacation.

Coyote Attacks throughout North America

While California has incurred far more coyote attacks on humans than other states, the problem seems to be arising and possibly increasing in other states. We currently have documentation of at least 17 coyote attacks on humans from 16 states (other than California) and 4 Canadian provinces; essentially all of these incidents occurred during the period 1988 through 2006 (Table 1). Most of these incidents are known to us as a result of media reports from newspapers. We have intentionally excluded all incidents in which the attacking coyote was proven to be rabid.

We suspect that some of the factors that lead to the development of habituated, aggressive coyotes more likely occur in Southern California than elsewhere, although it is possible that the circumstances that lead to coyote attack have simply developed earlier in suburban Southern California than they have elsewhere, and that this problem may become increasingly serious in other localities. This hypothesis is supported by the fact that we have been able to access many newspaper accounts of coyote attacks in California prior to the late 1980s, but almost none from other states or provinces.

Recognizing Problem Behaviors in Coyotes

There is a predictable sequence of observed changes in coyote behavior that indicates an increasing risk to human safety (Baker and Timm 1998, Timm et al. 2004). We define these changes, in order of their usual pattern of occurrence, as follows:

- 1) An increase in observing coyotes on streets and in yards at night
- 2) An increase in coyotes approaching adults and/or taking pets at night
- 3) Early morning and late afternoon daylight observance of coyotes on streets and in parks and yards
- 4) Daylight observance of coyotes chasing or taking pets
- 5) Coyotes attacking and taking pets on leash or in close proximity to their owners; coyotes chasing joggers, bicyclists, and other adults
- 6) Coyotes seen in and around children's play areas, school grounds, and parks in mid-day
- 7) Coyotes acting aggressively toward adults during mid-day.

A number of cities and states have adopted this sequence of behaviors for the purpose of collecting reports of coyote incidents and for determining an appropriate action threshold to implement coyote control measures. In many localities that use such a system, removal of problem coyotes is initiated when coyote behavior progresses to steps 4 or 5.

Why Has This Problem Developed?

Reasons for the development of coyote aggression toward humans, and the consequent increase in attack incidents, have been postulated from the time of the first reports. Howell (1982:21) described development of urban sprawl into Southern California mountain ranges, providing miles of urban interface with native brushy habitats, where "coyotes feel very comfortable at home, refusing to retreat..." He further noted that this suburban habitat provides them with "...abundant food choices such as readily available household garbage, pet foods, small pets, vegetable gardens, water, and vast assortments of other leftovers

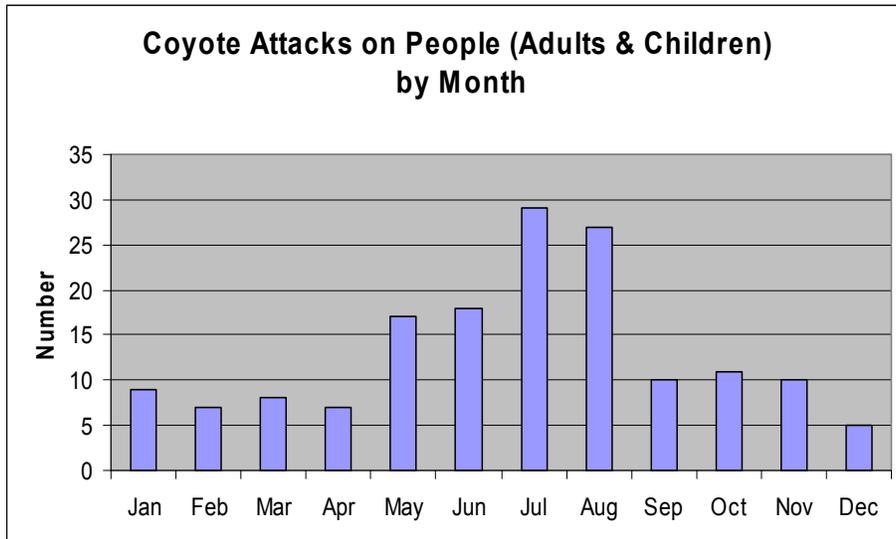


Figure 2. Distribution of coyote attacks on humans by month (from California incidents through 2006).

Table 1. Number of coyote attacks on humans by state (U.S.) or province (Canada), in which physical contact occurred (excluding California), through 2006.

State (U.S.)	Number of Attacks
AZ	17
NV	7
CO	3
MA	4
NM	4
NY	3
TX	2
WY	2
AK	1
CT	1
ME	1
NC	1
NE	1
PA	1
VT	1
WA	1
Province (Canada)	Number of Attacks
BC	8
ON	4
AB	2
NS	1

conveniently accessible day or night. Oftentimes food is intentionally provided by well-meaning persons who believe they are doing a good deed.”

The Mediterranean-type climate of California, with its prolonged warm and dry season (spring through fall), likely enhances the likelihood that coyotes will be drawn into residential areas, where irrigated landscaping surrounding residential and commercial developments provides an abundance of prey such as cottontail rabbits and rodents. This suburban sprawl accelerated following World War II, which drew an increased population into the area, where many aircraft industries supporting the war effort were located.

Concurrent with an increasing, expanded human population in Southern California was a change in human attitudes toward predators. As agricultural endeavors gave way to tracts of houses, organized predator control efforts that once protected livestock enterprises languished. Those who enjoyed hunting or sport shooting had to venture further away from the populated Los Angeles basin to engage in such activities. Thus, coyotes became increasingly habituated to the presence of a human population that largely ignored them, provided them an environment rich in food resources, and sometimes intentionally fed them, perhaps out of a developing “Disney mentality” toward wildlife.

This hospitable environment that developed in Southern California may be somewhat unique. However, some of these same factors attracting coyotes into suburbia have occurred in other suburban environments, particularly in the West, and apparently have led to an increased incidence of coyote conflict with people and pets, albeit a decade or two later than in the Los Angeles region. Others have pointed out that large mammalian predators, which were originally locally exterminated by ranchers and other early settlers as they moved westward, have now repopulated large areas of the country, thanks in part to legal protection, cessation of predator control, and a tolerant or even protective public attitude. In this regard, interesting parallels exist between coyotes and other species. For example, David Baron’s recent book *The Beast in the Garden* (2004) explores the return of mountain lions into the Front Range residential communities of Colorado, including their attacks on pets and humans. He raises the issue that these predators have now learned that humans are not a threat, and in fact, society has no idea how to deal effectively with such conflicts involving large predators that are now increasing in number and distribution.

Management and Education Needs

We believe that many conflicts between coyotes and humans in suburbia can be avoided. However, to reverse the current trend, authorities and citizens must act responsibly to correct coyote behavior problems before they escalate into public health and safety risks. When appropriate preventive actions are taken before coyotes establish feeding patterns in suburban neighborhoods, further problems often can be avoided. However, this requires aggressive use of scare devices and hazing, as well as correction of many environmental factors that have attracted coyotes into the neighborhood. Once attacks on pets have become frequent, or if human-associated food sources have been used by coyotes for an extended period of time (i.e., for several months or more), lethal control techniques will likely be required to prevent continued attacks on pets or future attacks on children or adults.

When aggressive behavior in a coyote develops, we know of no alternatives to removal of the offending animals. In suburban situations, both shooting and foothold trapping have been employed, with trapping having the greatest observed effect of re-instilling the fear of humans in coyotes. A 7- to 10-day trapping period using careful, selective trap placement in areas frequented by the offending coyotes is usually sufficient to re-instill their fear of humans. Eradication of all coyotes in the area is neither attempted nor necessary. The remaining coyotes using the area often disperse after removal of 2 to 5 coyotes; this is partially dependent on the size of the area, the number of coyote family units using the area, and the existing level of fear in the coyotes (Baker and Timm 1998). While lethal control of coyotes in suburban and urban areas is always controversial, the predictable consequences of inaction or delayed action is an escalation of the problem, with a concurrent increased risk to people (especially small children) and pets.

Preventive actions, if taken before suburban coyotes reach the stage of killing neighborhood cats and small dogs, can greatly reduce the risks of coyote attacks on people. Such preventive measures include the following:

- Reduce food resources in the habitat
- Reduce dense landscape habitat (prune & thin)
- Exclude predators using fencing, where possible
- Maintain predators’ “natural” wariness of humans by hazing and scaring methods

Unfortunately, not all people are equally able and willing to understand the root causes behind coyote conflicts in suburbia. Intentional feeding of coyotes, which seems to be especially likely to lead to aggression in some individual animals, is difficult to stop solely by means of local anti-feeding ordinances or statutes (local law enforcement always has tasks of a high priority). However, neighborhood peer pressure can be very effective in dealing with the single individual who persists in putting out food for “poor, hungry coyotes”. The message that concerned neighbors can forcefully convey is that one person’s feeding a coyote puts everyone’s children and everyone’s pets at risk.

And then, there are those folks who simply haven’t a clue as to how humans should relate to wild animals: The Los Angeles County Veterinary Public Health Services reported the following incident in La Verne (Los Angeles County), which occurred on May 29, 1999: “A 27-year-old male was bitten on the lip after trying to pick up and kiss a coyote...” (Karen Ehnert, D.V.M., M.P.V.M., L.A. County, pers. comm).

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