

## Conservation Perspectives

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### The Eastern Coyote: Documenting the Habits of One of Cape Cod's Newest Residents

by **Jonathan G. Way**, Boston College, Environmental Studies and Lynch School of Education

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#### Stalking the elusive...

Mashpee, Cape Cod: 8:30 PM, Sunday, February 25, 2001. The temperature is 33° F with wind gusts up to 40 MPH; hail is heavily and steadily precipitating. For the past 20 minutes, I've been parked in my red 1997 Toyota Tacoma — lights off -- facing a golf course that borders the back of an apartment complex. Many people have looked out of their apartment windows, apparently wondering what I am doing in their parking lot with my driver's side window rolled down in such miserable weather. Bored at last by my lack of movement, the human residents almost simultaneously close their curtains to separate themselves from the cold, stormy night.

I, however, am hot on the trail of my quarry and the receiver that I am using indicates that I am very close. Using binoculars, I scan a fairway that is covered with three inches of slushy snow. Although it is blocked behind heavy clouds, the full moon illuminates the open, snowy landscape of the golf course.

Materializing from the dark woods like ghosts, three large bodies magically emerge onto the back of the fairway. They gracefully lope across the golf course. The two animals in front notice something ahead and chase it at full speed. The third animal, 100 feet behind, pursues the action.



When the last animal is out of sight, I drive to a trail that leads in the direction where the animals are heading. I grab my receiver and track my quarry on foot. The weather is truly miserable. Golf-sized chunks of hail blow into my face. The chase leads me across a main road and back to the golf course where I first observed the animals. I walk along the south edge of the fairway, very close to the houses that border it, staying out of sight of my subjects. Inside, people watch television in their living rooms, completely oblivious to me and to the animals that I am tracking. After tracking them for half a mile, I see four bodies running back and forth on the golf course fairway and realize what two of the animals had been chasing: a member of their own group. All four animals are wagging their tails and appear to be having a great time as they take turns chasing one another. I am amazed to watch these creatures frolicking in such nasty weather, seemingly oblivious to the harsh climate. Since the wind is in my favor, none of my subjects notices me standing at the edge of fairway; they are too intent on releasing excess energy. After their game of tag, they casually retreat.



Watching the animals with their exuberant energy, it is difficult

not to anthropomorphize that they are excited just to be alive.

Tucking the receiver into my jacket to protect it from the elements, I follow the animals' fresh tracks down a slushy neighborhood street, then onto another dirt trail covered with fresh, three-inch long tracks. After jogging another 150 meters, I stop short -- only 12 feet away from my quarry. The biggest animal is wearing a radio collar. Another senses me and trots out of sight. The collared animal follows. However, the remaining two animals decide to investigate. Each goes into the edge of the woods and silently walks within eight feet of me. When they get behind me, they walk onto the trail and sniff the air. It is at this point that they realize that I am a human. They retreat into the woods and quietly but swiftly hightail it out of sight. I trudge a mile back to my car, nearly frozen to death. The first thing that I record into my notebook, with very numb fingers, is: "Wow, what a night!"

## Eastern coyotes reach Cape Cod

The animals that I was tracking were eastern coyotes, *Canis latrans* var. I was following them in a typical suburban area on Cape Cod and, specifically, was radio tracking an adult male, 44-lb coyote named Kett (for convenience in identifying and remembering individual animals, we name our coyotes based on capture events and/or local features, i.e., the Cotuit Kettleer's). Kett has been radio collared for 2.5 years. His group uses a chunk of Cape Cod real estate from the Mashpee/Falmouth town line to the Barnstable/Mashpee town line that covers approximately 15 square miles.

The eastern coyote is believed to be a hybrid between the western coyote (*Canis latrans*) and either the red/eastern timber wolf [*Canis rufus* (red), or *C. lycaon* (eastern timber) as currently is proposed] or the gray wolf (*Canis lupus*). This canid is thought to have reached northern New England by the 1930's and 1940's; it has moved steadily southward, now occupying virtually all suitable habitat in the Northeast. Most researchers believe that coyotes colonized Cape Cod around the late 1970's, most likely by swimming the canal and/or crossing directly over the two bridges that connect Cape Cod to the mainland. One theory, however, attests that these canids have always inhabited New England and merely survived at very low densities in the early 1900s. Our data does not support the latter theory, as we have found that coyotes generally are able to colonize new areas quickly.

I obtained my Master of Science degree from the University of Connecticut at Storrs last May (2000) by documenting the ecology of eastern coyotes on suburban Cape Cod. The Cape Cod coyote research team, which I am leading, consists of members from the University of Connecticut, Boston College, Barnstable High School, and the Hyannis Animal Hospital. Because of the bad press that coyotes have received in the past few years, we have made it our mission to learn as much about the eastern coyote as possible. Therefore, to gain reputability, it was important that we collected scientifically sound data in order to accurately document the basic natural history traits displayed by eastern coyotes on Cape Cod. The researchers believed that it was important to initiate this project for two main reasons: 1) there have been few ecological studies of eastern coyotes; and 2) no studies have been conducted in Massachusetts or in suburban areas of the Northeast.

## Radio collaring and tracking coyotes



In order to study coyote behavior in the wild (or that of any other elusive animal species), researchers must first capture and radio collar them. Radio telemetry is a technique by which a biologist is able to monitor an animal by remotely tracking a radio signal emitted from a transmitter (radio collar) attached to the animal. A researcher can track the signal, and the animal's location, by tuning a specifically designed receiver to the transmitter's specific frequency and scanning the surroundings with a directional antenna. The closer one is to the transmitter, the stronger the signal reception. By radio collaring animals, biologists can identify individuals and follow them at any time of the day. In our study, we tried to sample location points of radio transmitted coyotes evenly throughout a 24-hour period. We tracked from midnight through 4 AM almost as much as we did from noon to 4 PM. This unpredictable schedule makes the life of a coyote researcher very demanding and time consuming, but provided key insights into our study subjects.

Capturing the coyotes was our first problem because the padded leg-hold (or foothold) trap, the typical method used to capture wild canids, became illegal in Massachusetts in 1996, even for research purposes. Therefore, we tested the feasibility of using box traps -- the only known, legal, alternative capture device -- to capture coyotes. Despite capturing many raccoons, crows, opossums, domestic cats and dogs, skunks, and a few foxes and gulls in these large, 60-70 pound traps, we captured eleven individual coyotes sixteen times during our two-and-one-half year study. We believe that we are the first group to successfully





document capturing coyotes in box traps. Seven of the eleven coyotes that we trapped and monitored were adults; the remaining four were juveniles.

Radio collared coyotes had large home ranges for suburban Cape Cod. The average home range of adult resident coyotes in our study was 11.5 square miles, and varied from 6 — 18 square miles. Interestingly, the coyote with the smallest home range lived in Hyannis, the most urban part of Cape Cod. This female coyote was regularly documented as having traveled throughout her established home range, which abutted the Cape Cod Mall area. One adult coyote with no definable home range covered an area greater than 50 square miles. The three young coyote pups and one juvenile captured during our study had smaller ranges than adults, as was expected. In general, pups traveled within part of their parents' home ranges.

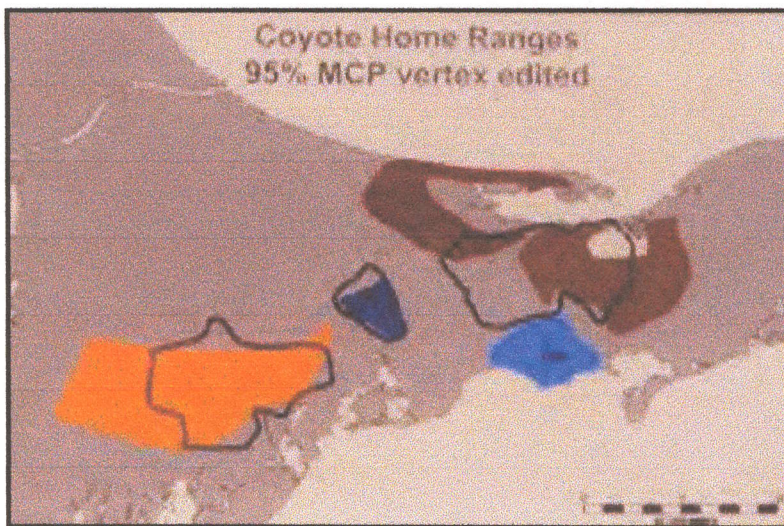
Six of the eleven coyotes captured during the study are still alive. Two pups were hit and killed by cars, one adult died of kidney failure, and two juveniles dispersed off the study site. The adult coyote that had the large, undefined home range has recently paired with the female coyote from Hyannis and is now the breeding male for that group.



Although we had a relatively low sample size of radio tagged coyotes, we managed to locate each one an average of 400 times. Four of the adults have been located over 600 times each! The large amount of data recovery per animal gave us a good perspective for how individual coyotes move through a fragmented and human dominated landscape.

## Territory and behavior

Cape Cod coyotes appear to be territorial. Our data indicate that radio collared coyotes appeared to spatially avoid areas used by collared coyotes in adjacent areas. This finding is consistent with the literature describing coyote natural history in various areas of the United States. In an average territory of approximately 11 square miles on Cape Cod, one coyote group will exclude other coyotes from occupying that area through means such as howling, scent marking, and direct encounters.



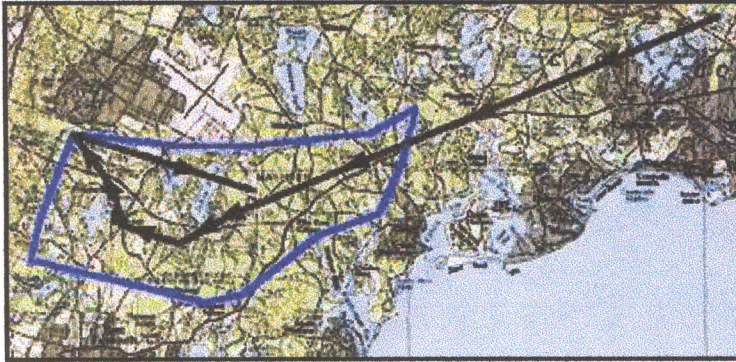
Many young coyotes will disperse through or along the edges of these territories, moving on when they encounter the presence of a resident group, until they can find a suitable area where other coyotes do not live. This is precisely how coyotes colonize new areas, including Cape Cod and the Northeast. If a territory is vacant (i.e., not actively defended by resident coyotes), dispersing coyotes quickly move into it within days or weeks; therefore, it is fruitless to kill coyotes in a specific area simply to get rid of the coyotes. Sometimes it is necessary to remove specific animals if individual coyotes in an area are threatening human safety or creating problems for other wildlife populations. Coyote territories appear to be relatively stable in our study area, as we have documented a high survival rate of radio collared adults. Future long-term research is needed to accurately document the territorial aspect of coyote behavior.

Many resident groups on Cape Cod consist of three adult coyotes. A few groups consist of four adults. Coyote groups appear to consist of a breeding male and female and an offspring or two of the previous year that delay dispersal in order to help raise the current generation of pups. Although many sightings are made of single coyotes, other members of that resident group are probably close to where the observed coyote was spotted. When individuals do get separated, howling is a common method for members of a group to communicate and subsequently reconvene with one another.

Now that coyotes are seen regularly in Massachusetts, I frequently read in newspaper articles that they appear to be "everywhere." All of our collared coyotes moved an average of 10+ miles a night, which, in a suburban setting, involves coyotes traveling through many neighborhoods. A single coyote or a group of 3-4 coyotes can be seen in widely different areas within its respective home range during the course of one night. Because coyote groups appear to be territorial, most likely the same individuals are repeatedly sighted in a relatively large (>10 mi<sup>2</sup>) area.



A young male coyote in our study displayed a dramatic example of a long-distance movement. In a 25-hour span he traveled off of his natal range then back to his family's home range (about 15 mi<sup>2</sup>). Although his movement was atypical, in the course of one night, this individual traveled well over 20 miles and moved through five towns - Barnstable, Mashpee, Falmouth, Bourne, Sandwich, and back to Mashpee.



Coyotes are mostly active at night. All long distance movements during our study were documented during nocturnal hours. However, coyotes were occasionally sighted during daylight hours throughout the year. During the pup-rearing period of April — June, breeding female coyotes tend to be active during the day as well as night. Because pups are vulnerable to cold and predators, mother coyotes must hunt in intervals, regularly returning to provision and protect their pups. Every spring, I read newspaper articles describing the strange, bold demeanor of certain coyotes. Most people do not realize that this is completely natural behavior displayed by coyotes, especially females, during pup-raising season. Because the need to provision a den site at regular intervals forces them

to be more visible during diurnal hours, coyotes may appear to act boldly around humans during the pup-rearing period. There is, however, a difference between acting boldly and being a threat. I would bet that the majority of complaints come from neighborhoods that have active coyote den sites nearby.

### Wariness of the researcher

All of the coyotes that I have followed avoid me when possible and seem to disappear into thin air when they become aware of my presence. At the beginning of the study, I suspected that coyotes would associate my scent with a free meal (i.e., via baiting and conditioning them to trap sites) and would rapidly become accustomed to my scent and become comfortable around me. However, because I trap, handle, collar, and track the coyotes, the opposite effect seems to have occurred. They seem to realize that I follow them disproportionately more than the average human does.

For example, one day I was on a golf course approximately 300 meters from a coyote who was lying down on a large rock at the edge of a marsh. This canid was out in the open (but near brush) and was casually watching as golfers and golf carts traveled within 15-20 meters of him. The moment the wind shifted directions and my scent blew towards the coyote, it immediately stood up and started barking at me. It continued to bark for more than fifteen minutes. Bewildered, the maintenance workers asked me why that coyote was barking directly at me when they were so close to it. I replied that this coyote (and probably most collared groups in our study) must recognize my scent and associate it with danger above and beyond the normal human scent.



It makes sense that the coyotes are wary of me because I am probably the only human that occasionally disturbs them while they are bedded during the day. In addition, I find their dens and pups as I patrol the wooded areas. Interestingly, the incident on the golf course occurred during the denning season. The radio collared female coyote was in the woods at the den site, and the coyote that barked at me seemed to be guarding and scanning the area for danger. The barking coyote was uncollared but had been sighted several times with the collared female; he appeared to be the breeding male of that group. All of my encounters with coyotes, including disturbing denning sites with multiple adults present, have ended in the same way: the coyotes quickly hightailed it in the opposite direction from me.

### Coyote and human interactions

Despite the adult coyote's apparent ability to thrive in a highly fragmented and suburban setting such as Cape Cod, there was one exception to this trend: the denning season. All den sites (including Hyannis) were found in areas of coyote home ranges with a low housing density around the immediate area of the den site. Wooded areas within coyote home ranges, therefore, seem to be especially important during late spring and early summer to protect and hide pups of the year. Future efforts should continue to preserve wooded areas on Cape Cod and in similar suburban areas to buffer the distances between potential or active coyote den sites and human houses in an attempt to minimize potential human-coyote conflicts.

Many people today live in neighborhoods where they feel removed from nature. However, a predator like the coyote brings the drama of nature directly to people's backyards.





Sightings may occur at any season and in many locations, considering the coyote's large home range and its ability to roam. It is up to us to protect our pets by leaving them inside, especially at night, and to secure our garbage in order to avoid potential encounters. Personally, I am amazed that there are not more human-coyote conflicts, considering that coyotes are year-round residents of their home ranges and that people continue to leave their pets and garbage outside.

The coyote is here to stay from both a biological and social standpoint. They are nearly impossible to exterminate for several reasons. Research shows that new coyotes would repopulate an empty territory almost as soon as it was available. Public opinion decries the random extermination of wild animals, including coyotes. In addition, many people value and relish observing the elusive coyote or, at least, are satisfied in knowing that it is surviving in an increasingly human-dominated world.

I look forward, along with my research team, to continue to track this incredibly interesting predator well into the future. I am currently in a Ph.D. program at Boston College. We are continuing our current research on Cape Cod coyotes, which has developed into a long-term study and will also expand from the Cape Cod study site to investigate the ecology and behavior of coyotes in the Boston area.

### Articles for further reading:

**Andelt, W.F. 1985.** Behavioral ecology of coyotes in south Texas. *Wildlife Monographs*, 49: 1-45.

**Harrison, D.J. and J. R. Gilbert. 1985.** Denning ecology and movements of coyotes in Maine during pup rearing. *Journal of Mammalogy* 66:712-719.

**Harrison, D.J., J.A. Harrison, and M. O'Donoghue. 1991.** Predispersal movements of coyote pups in eastern Maine. *Journal of Mammalogy* 72:756-763.

**Harrison, D. J. 1992.** Dispersal characteristics of juvenile coyotes in Maine. *Journal of Wildlife Management* 56:128-138.

**Parker, G.R. 1995.** Eastern coyote: the story of its success. Nimbus Publishing, Halifax, Nova Scotia. 254 p.

**Person, D.K. 1988.** Home range, activity, habitat use, and food habits of eastern coyotes in the Champlain valley region of Vermont. M.Sc. Thesis, University of Vermont, Burlington. 103 p.

**Person, D.K. and D.H. Hirth. 1991.** Home range and habitat use of coyotes in a farm region of Vermont. *Journal of Wildlife Management* 55:433-441.

**Way, J. G. 1996.** Baseline data on the interactions of a population of white-tailed deer, eastern coyote, and red fox inhabiting a barrier beach ecosystem on Cape Cod, Massachusetts. Honors Thesis, University of Massachusetts, Amherst. 35 p.

**Way, J. G.. 2000.** Ecology of Cape Cod coyotes. M.Sc. Thesis, University of Connecticut, Storrs. 107 p.

### Articles currently under review:

**Way et al.** Box trapping coyotes in Massachusetts. *Wildlife Society Bulletin*.

**Way et al.** Home range, territoriality and sociality of Cape Cod coyotes. *Canadian Journal of Zoology*.

**Way et al.** Movement and activity patterns of Cape Cod coyotes. *Journal of Mammalogy*.

**Way et al.** Denning behavior of Cape Cod coyotes. *American Midland Naturalist*.

**Way et al.** Injuries sustained to coyotes captured in box traps. *Wildlife Society Bulletin*.

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