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### Driving Animals to Their Graves

Every day in the U.S.A., 190 million motor vehicles hit the road, and as many as 1 million animals get hit by motor vehicles. The annual death toll is nearly 300 million animals. As **Mark Mathew Braunstein** explains, these appalling statistics of roadkill derive directly from our century's obsession with the automobile, as highways divide habitat and car emissions ensure fewer but hungrier animals. Short of abandoning our cars, there are still solutions that help to preserve lives in the roadway clash of humans and wildlife.



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#### Front Cover

New guidelines for feline vaccinations suggest that indoor cats, at less risk for some diseases than indoor/outdoor or feral cats, need fewer vaccine visits to the vet.  
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#### Back Cover

This deer luckily managed to avoid becoming a statistic, but between 500,000 to 1,000,000 companion animals and wildlife are killed every day by vehicles on the road.  
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# Roadkill: Driving Animals to Their Graves

**S**unday sundown. A cool breeze sweeps the land. A snake coils his frigid body upon some asphalt still radiating warmth from the sunset. A motorbike speeds by. *Splat!*

Monday morning. A robin, an early bird out to catch an early worm, notices the half-baked snake. A car approaches. Its drowsy, distracted driver sips from a 7-11 commuter's coffee cup. The robin stretches her neck to peck. *Snap!*

Midday. Two ravenous ravens spot the flightless robin. One swoops down just as a Mack truck rounds the bend. *Smash!*

Midnight. A raccoon drags the roadside robin and raven into the brush, where she dines in safety on yummy morsels of feathered flesh. The raccoon is out-to-lunch and the out-of-luck birds are out-of-sight. Thus ends a morbid cycle begun by a motorcycle.

### The Numbing Numbers

Every day in the U.S.A., 190 million motor vehicles hit the road, and as many as 1 million animals get hit by motor vehicles. That's counting cars, buses, motorbikes, and trucks, but not ATV's, snowmobiles, and other off-road vehicles. And that's counting mammals, birds, reptiles, and amphibians, but not insects and bugs with boneless backs, who somehow never count.

In an annual funeral procession, our nation's experimenters kill 20 million lab animals, hunters 200 million game animals, and motorists nearly 300 million road animals. Only America's meateaters take a larger toll than its motorists, because for animals the roads that lead to slaughterhouses are all dead ends.

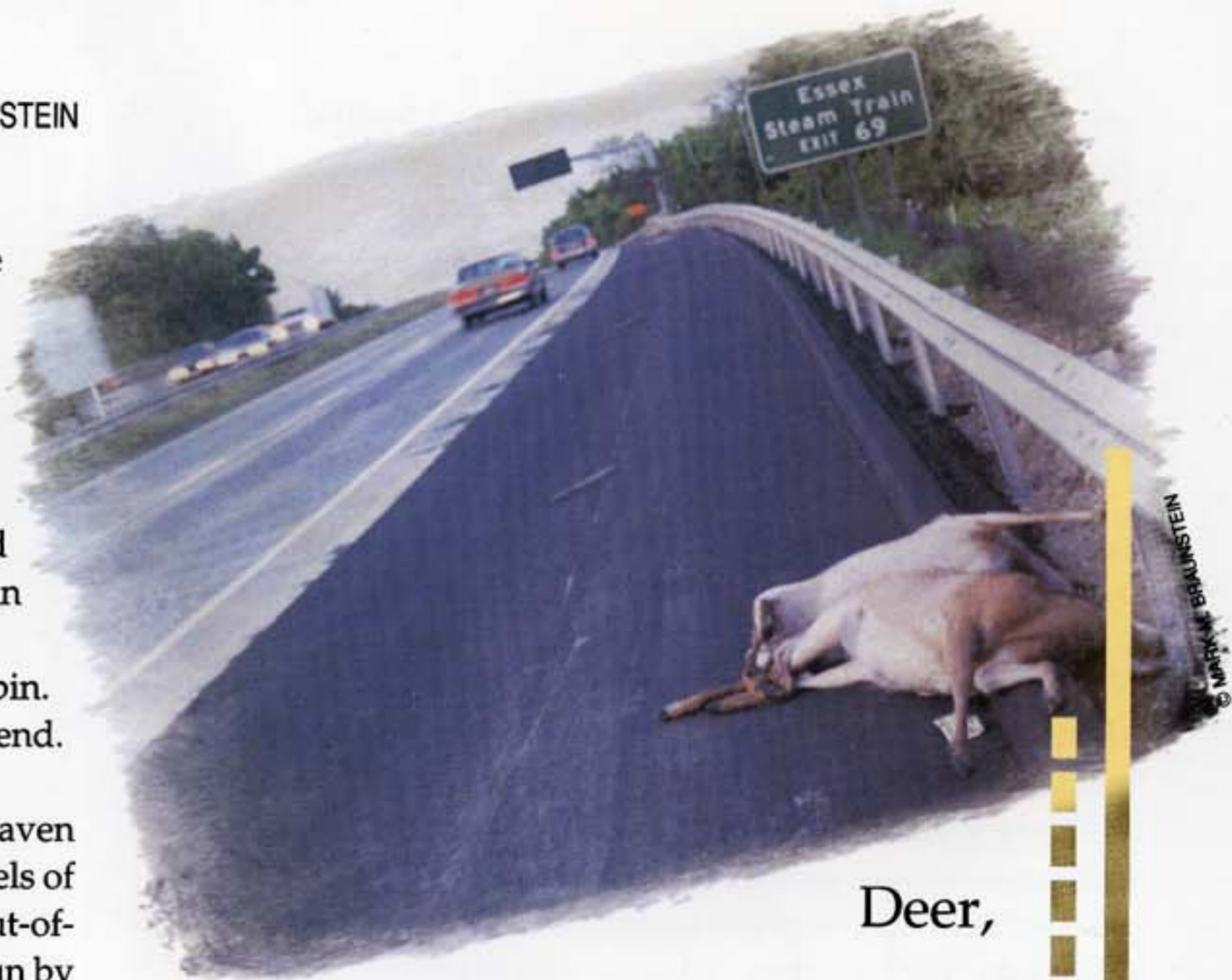
For every animal bumped off by a bumper that we see gutted in the gutter, three or four more die unnoticed. For instance, even at 55 mph, we smell the remains of far more bumped skunks than we see. The walking wounded and crawling crippled manage to die far from the road, so only instantly killed animals are seen and get counted. But who's counting?

During the late 1950s, the Humane Society of the United States (HSUS) conducted some Fourth of July body counts. During the 1970s, HSUS compiled data from isolated scientific studies of single roads or single species. The secondary sources yielded the same national death toll as their own field studies: one million animals a day.

Two current surveys, The Strah Poll and Dr. Splatt, both conducted since 1993, suggest an updated and relatively upbeat death count: one-half million animals a day.

The Strah Poll is compiled by Cathy Strah, a transportation worker in Mentor, Ohio. Mentor is a middle American town outside Cleveland and on the trajectory of Interstate 90. Strah gathers statistics on the animals recovered by road crews. They collect the dead, she collects the data.

By 1997, the five-year gruesome grand total was a scant 3113, scarcely 2 a day. This anecdotal body count excludes the injured that crawl away, the scavenged that get dragged away, and the diminutive birds, reptiles, and rodents too tiny to spot



Deer,  
swans, cats, dogs,  
opossums, squirrels, skunk,  
raccoons . . . the death toll  
of animals hit by motorists  
ranges from 500,000 to  
1,000,000 *per day*.



from the cab of a truck.

### Squashed Squirrel or Splat Rat?

The Dr. Splatt project is coordinated by Brewster Bartlett at the Pinkerton Academy. It engages mostly junior high students from forty schools throughout the Northeast, statistically more sound than from just one town. But when the students go on vacation, the statistics go on vacation too, including all summer long. During hazardous weather, furthermore, protective moms likely keep their kids off the

streets. And pubescent teenagers may lack identification skills to discern a squashed squirrel from a splat rat.

While neither survey is definitive, they're presently all we've got. Dr. Splatt's data distill into a steady ratio of one vertebrate animal per mile per month, regardless of traffic or terrain. This amplifies into slightly over one-half million animals per day.

If one million daily was accurate 25 years ago, and if one-half million daily is accurate today, we may wonder whether the decline is good news or bad. The internal combustion engine automobile was invented 114 years ago. That's merely three or four human generations, and merely thirty or forty animal generations. While some species have gotten "street" smarter, most species have only gotten scarcer.

State wildlife agencies tally road fatalities only for large mammals so rare that they are listed as endangered species or so common that they are hunted as fair game. The National Highway Traffic Safety Administration chronicles the 47,000 Americans who die each year in traffic accidents. But it neglects to collect data on the animals whose deaths it does not even define as accidents. In the American lexicon, humans are living flesh and traffic deaths. But animals are dead meat and roadkills.

## Street Violence

While there may have been a rare ancient-chariot-kill on a road leading to Rome, or a random wagon-wheel-kill on the old Oregon Trail, roadkills did not become common until our modern motorized Age of the Automobile.

Cars are the biggest source of smog. For every American who dies from riding cars, another dies from breathing them. Animals also breathe, and also die. Plants too die from the same foul photochemical air, and fewer plants mean hungry and fewer animals.

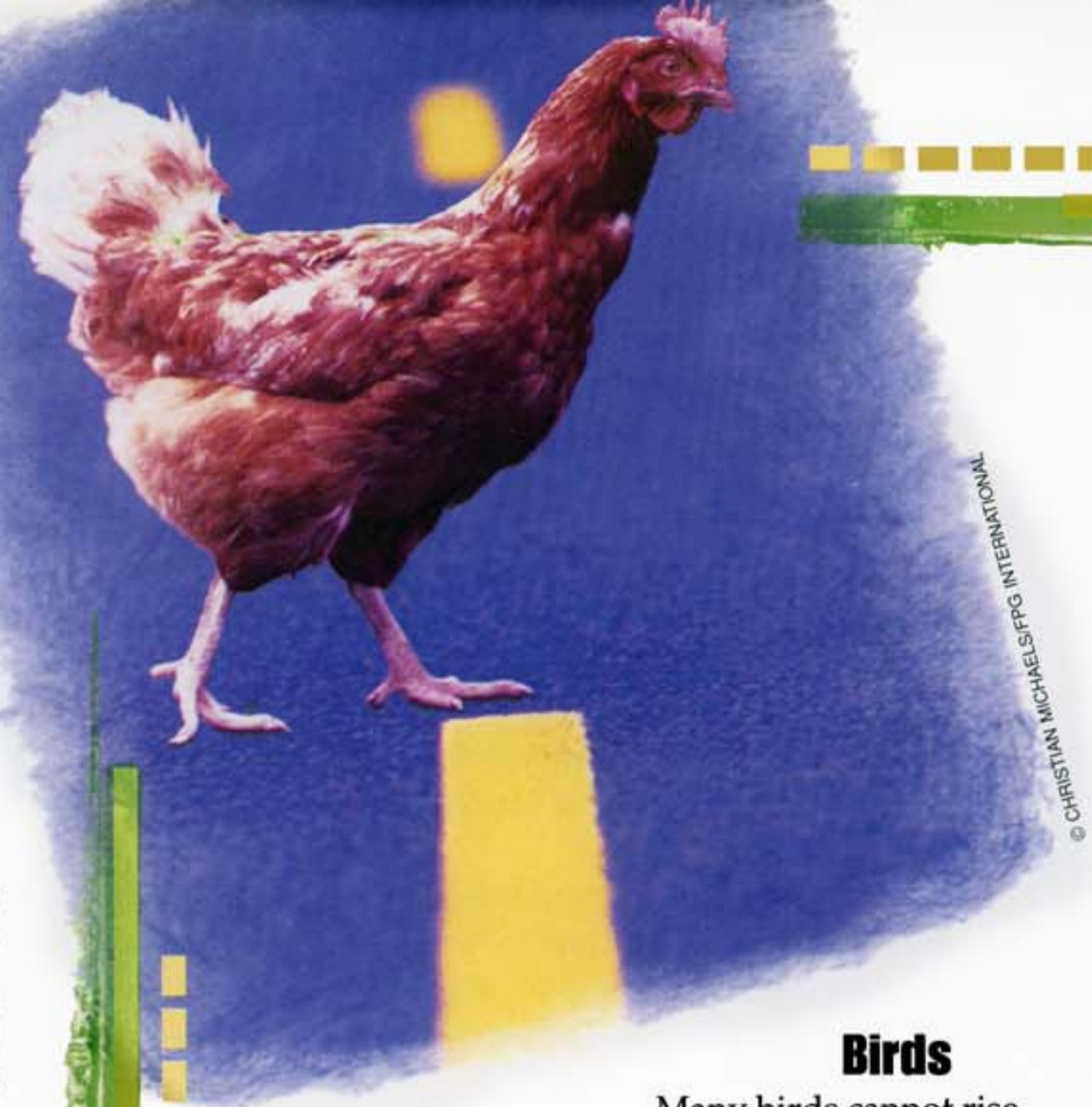
As cars pollute air, roads erode soil. Roads also erode family values. Animal family values. Four million miles of roads have steamrolled across this nation, fragmenting and destroying their habitat. Habitat loss means many animals come from broken homes, so they run away from home, but there's no place to run. On the road to nowhere, they get run over.

Fauna fatalities peak along secondary roads through edge habitat where field meets forest or where meadow meets marsh. Add more during late summer and early fall, when springborn leave home to strike out on their own. And add more on new and full moons, when drivers seem more reckless and animals less reclusive. And more on Friday and Saturday nights, when celebratory drivers get "smashed" and when unsuspecting animals get smashed too.

## Paving the Way to Extinction

Some species seldom get roadkilled only because they avoid roads like the plague. Other species no longer get roadkilled only because they became extinct.

Woodland caribou survive as a single herd of 50 diehards in northern Idaho and southern British Columbia. The U.S. Forest Service blames roadkills, not habitat loss, as the greatest threat to their survival. British Columbia Highway 3, which bisects their remaining range in the Selkirk Mountains, was built along their traditional trail. But now it is their road less



## Birds

Many birds cannot rise fast enough to evade an oncoming car, unless they fly directly ahead of the car, using the air current it pushes to provide extra lift. If you brake for a bird flying straight ahead of you, you may take away the push he needs and send him crashing into your windshield. Lift your foot off the gas until the bird rises above your car or peels away to one side.

## Cats

Cars killed 5.4 million cats last year, most of them at night. Typically cats know cars are dangerous, but confuse the beams from your headlights with your car itself. When the lights go by them, they think it's safe to dash out. Expect them to make that mistake and you'll be prepared to react if they do.

## Dogs

1.2 million dogs were killed on U.S. roads last year, and most of them were likely chasing something — a ball, a child, a cat, a squirrel. When you see anything that a dog might chase enter the road, look for the dog.

## Opossums

Opossums feast on roadkill, a habit that gets about 8.3 million opossums a year roadkilled. A large object in the road at night may be roadkill and an opossum, who may either freeze in your headlights or try to run away. Opossums don't run very fast, so slow down until you've positively identified the situation.

## Rabbits

Common in late spring, a rabbit scared out of the road by the car ahead of you might circle right

# Roadkill Avoidance Tips

back into the road. A quick tap of your horn as you approach where the rabbit went may freeze him out of harm's way.

## Beavers

In spring young beavers leave their parents to seek their own pond. They move slowly, usually at night, and can be hard to see — but if you're driving near wetlands, expect them. They typically try to cross roads at culverts.

## Raccoons

Raccoons often travel in family groups of up to seven members, so if one raccoon is hit, the rest may stay beside her and get hit, too. Raccoons also scavenge roadkills. They'll turn to face a sudden danger, often stepping into the path of a speeding car. Try to avoid getting their attention. Don't jam on the brakes, don't accelerate; just ease off the gas and cruise casually by.

## Turtles

In spring, so many turtles are hit by cars as they migrate between breeding ponds that many species have become regionally endangered. If you're near wetlands and see a rounded lump in the road, assume it's a turtle until you know otherwise.

## Deer

More than 100 Americans are killed each year in deer/car collisions — and 70% of the time the driver slowed down for one deer, then stepped on the gas and hit another. Deer babies are as big as their mamas in October and November, but they are still babies, and they still follow Mama. Mamas often have two fawns, so if you see one deer, slow down and look for two more.

In spring and summer, deer hide from danger. In fall, when the leaves are down, they run. More than half of all deer/car collisions occur in October and November. If you see hunters' vehicles parked by the road, watch for frightened deer running from gunfire, or hunters and/or dogs driving deer.

## Skunks

Skunks newly awakened from winter hibernation are slow to recognize danger. When threatened, their defense is to turn their backs and spray. If you see a skunk beside the road, don't slow down abruptly. The skunk may think you've seen him and will attack. Act as if you're minding your own business and he'll go on about minding his.

In July and August, a skunk may be leading four to seven kittens across the road, and they may trail up to 20 feet behind her. If you see one skunk, look for more before assuming it's safe to pass.

## Snakes

Coldblooded snakes will warm themselves on pavement in late summer, but they often can't move away quickly when a car approaches. If you see a straight object that looks like a stick in the road, assume it's a snake until you know it isn't.

## Woodchucks

Woodchucks dart out on the road much like cats, hunched low to the ground to avoid being seen. Drivers who often mistake them for cats allow enough time for a cat to cross in front of them; but a woodchuck at best moves only half as fast, and 5 million woodchucks a year get hit by cars. That fat brown cat in the road ahead may be a woodchuck.

## Frogs

In wet weather, if you're near a pond or ditch and it's not yet fall, you'll likely be seeing frogs. They'll freeze in your headlights, so don't expect them to move. Slow down and try to drive around them.

## Moose

In winter, moose will lick road salt and travel along ploughed roads. At night, moose are almost invisible because they are dark, don't make sudden moves, and are tall enough that your tired eyes fixed to the headlit roadway may not recognize them. Slow down in moose country, and keep your eyes moving up and to the sides.

## Bears

Bears feast on roadside grass or berries, especially in remote country, so beware of thickets close to the road. When bears bolt across roads, they do it at a dead run, and babies follow Mama. If you see one bear, look for two more. And look out for bear-watchers who've stopped their cars in the roadway.

## All Species

It's easier and safer to anticipate animals in the road than it is to miss them once they're in front of you. Watch for sudden movement in roadside grass and shrubbery. Remember that most lines in the woods are vertical — if you see something horizontal, it may be an animal.

*Compiled by Merritt Clifton, editor, Animal People.*

traveled.

Of our nation's large mammals, Florida panthers hover nearest extinction. During the early 1980s, the panthers suffered nine roadkills — half their entire population.

During the 1970s and 1980s, at least 357 of Florida's threatened black bears blackened the blacktop. That's one-quarter of their present 1990s population.

Fewer than 300 of Florida's sub-compact size Key deer survive, most of them on Big Pine Key. Still, a Key deer is struck down by a Mercury Cougar or its ilk an average of once a week. In 1995, of 89 confirmed fatalities, 65 were roadkills. In 1996, of 104 deaths, cars claimed 67. Despite a 15 mph speed limit, vacationers and retirees remain the deer's worst enemy.

## Road Worriers

Let's stop only worrying. Let's get serious and do something. Let's examine potential solutions.\* They can be classified in five ways:

### 1. Deflection: Keep Animals Off Roads

Rural dirt roads rack up more roadkills than two-lane highways, and two-lane highways more than four-lane. Wider shoulders and medians generally accompany wider roadways, all which either build better barricades to keep animals off roads or which offer greater visibility to keep drivers' eyes on animals.

In 1982, a combined study by the Department of Transportation and the Fish and Wildlife Service listed road designs that could reduce roadkills. Perhaps least costly and most effective are Strieter-Lites, reflectors affixed atop stakes. Reflecting the beams of headlights, a thousand points of light could alert nocturnal animals both to lurking roads and lurching cars.

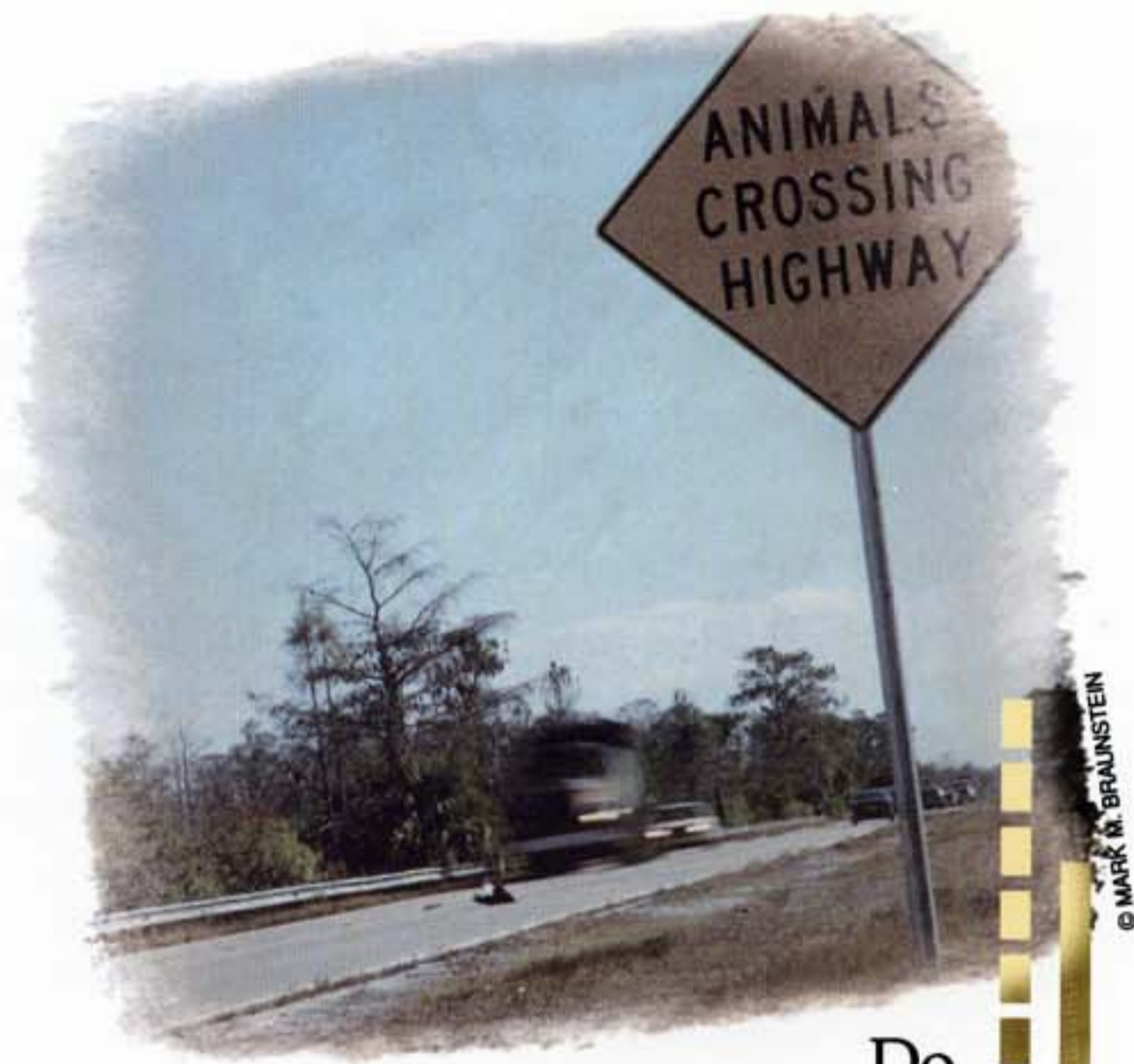
Meanwhile, the first badger tunnels were built in Great Britain in 1958, and the first toad tunnels in Switzerland in 1969. Amphibian tunnels are small investments, and have been constructed throughout Northern Europe.

Closer to home in Colorado, a combination of fencing and underpasses on I-70 has proven effective in routing mule deer off the road. In Florida, the expansion of Alligator Alley into I-75 was accompanied approximately every half mile with underpasses for the Florida panther and for any other animal willing to risk passage with a panther. Unfortunately, what proves effective for one species can be quite useless for all the others, especially if one species is a predator and all the others are its prey.

These sites in Colorado and Florida are exceptions, not rules. Rampant ramps, underpasses and overpasses, culverts and contours, fences and trenches, all add to highway costs. While much big bucks can prevent some dead ducks, state and federal highway departments usually expend their budgets elsewhere.

In 1997, the state of Washington proposed building an overpass for a highway connector in Pierce County to minimize roadkills of a threatened species of squirrel. Proposed cost: \$2 million. Also in 1997, Florida proposed constructing a barrier along two miles of U.S. Highway 441

\* With thanks for some of the following suggestions to Patrice Greenville and Merritt Clifton.



Do

motorists pay heed to this advisory highway sign any more than they do to speed limit signs?

In both instances, inattention may have fatal consequences.

that pass through Paynes Prairie State Preserve, where biologists estimate one million roadkills occur every year. Proposed cost: \$2.6 million.

In 1995, the U.S. Army announced plans for a million dollar tunnel under a Virginia parkway to connect its Fort Belvoir wetlands to an adjacent wildlife refuge. Yet the only way of ensuring animal passage through the tunnel would be to erect an accompanying fence along the parkway. A billion dollar Berlin Wall would work. Or a trillion dollar Great Wall of China.

While a tunnel without a fence can be wasteful, a fence without a tunnel can be harmful. Many animals do cross roads unscathed. Their successful crossings guarantee their settling new homes, or securing more food, or soliciting many mates. A totally effective fence may prevent deaths, but it also may prevent births.

### 2. Legislation:

#### Keep Roads Off Maps & Drivers Off Roads

Road banning would help more than mere road planning, especially because new roads initially generate more roadkills than old. The equation is simple: fewer motor vehicles equal fewer roads and fewer roadkills.

Replacing twenty cars with one bus, and fifty trucks with one train, would reduce congestion on present highways and postpone or eliminate the need for new ones. In order to revive our ailing public transit and mass freight systems, we need an act of Congress.

Legislators can reduce the speed and enhance the safety of

our cars. Enforced lower speed limits would afford greater protection from cars for every animal on the road, and for every human inside the cars too. But as long as automakers manufacture cars capable of cruising at 110 mph, twice most legal speed limits, whatever lawmakers dictate will be disobeyed by chronic speedsters on public speedways.

### 3. Detection:

#### Help Drivers Detect Animals On Roads

Most roadkills occur at night, when nocturnal animals are least visible to predators and to motorists alike. Automakers could modify existing headlights to shine brighter, and could equip vehicles with innovative wide-beam headlights capable of switching on left, right, or both.

Wide-beams would enable drivers to keep better watch, rather than the current mere candlelight vigil, for animals on road shoulders and medians. And animals such as opossums would freeze in their tracks on extreme right shoulders or extreme left medians, rather than on the politically incorrect middle-of-the-road where they experience mid-life crisis.

Automakers also could offer optional nighttime detection devices such as infrared beams and radar screens.

### 4. Education:

#### Prepare Drivers to Expect Animals On Roads

Much like the human tragedies that gather in hospital emergency rooms, roadkills occur more frequently during new and full moons. Daily traffic advisories about moon phases broadcast or published with weather reports offer some potential for preventing roadkills. But that's assuming motorists remember even weather reports just two minutes after hearing them (they don't), and that they would drive more carefully just because of the month or moon phase (they won't).

Knowing how to expect an animal to act, which species flee, which freeze, which simply ignore the onrush of a vehicle, and what species during what seasons to expect in our paths, all would prepare drivers how to react. (See "Roadkill Avoidance Tips" on pp. 24-25.) Driver education courses could teach the essentials about animal behavior, but presently prepare future motorists merely for a driving-license-to-kill.

### 5. Attention: Keep Drivers' Eyes On Roads

Avoiding nighttime driving prevents roadkills. And reducing driving altogether prevents roadkills and roads. But drive we do.

So here's some Rules of the Road. Glance continually from the road to the roadside. Inspect shoulders and medians. Expect surprises. Expect surprised animals in surprising places. Be prepared to honk, swerve, brake, but never abruptly. With automatic transmissions, driving with both feet, left for brake, right for accelerator, reduces reaction time. Keep alert, not drowsy, drugged, or drunk.

All of us motorists dutifully keep alert for other motorists. Most of us keep watch too for the rare two-legged pedestrian. Some of us keep watch even for two-wheeled bicyclists, a vigil which surprises everyone, particularly the bicyclists. But few of us keep our minds open to the possibilities of slow scurrying mammals or low-flying birds.

We should be keeping watch for black bears and white-

tailed deer, spotting them 'way in the distance, alive and breathing, alarmed and fleeing. As we admire them from afar, we just might feel a stirring kinship with the Earth and all its animals, even when we are cruising 65 mph in autos on asphalt.

### Nope for the Future?

We could more lazily just stare blankly into the fleeting landscape, just sit around in our cars and do nothing. Some species, after all, do not need our help.

Raccoons, squirrels, and opossums attempt crossings far less successfully than other mammals. Yet no matter how many gain admittance to the graveyard atop Roadkill Hill, their species still thrive.

Other species have developed remarkable coping skills during the very short time that the motorist has joined the ranks of their more traditional predators. Many deer now look both ways before crossing streets.

Highly intelligent crows, who thrive as scavengers upon roadkills, nevertheless themselves escape becoming grim highway statistics. Species less intelligent than crows simply require several more generations to learn how to cross roads as skillfully as they long ago mastered how to ford streams.

Still, new threats loom over the highway horizon. The elephant-foot-shaped concrete Jersey barriers that have metastasized along the medians of our nation's highways could not be any more efficient in blocking quadruped pedestrian traffic. Dividers between life and death, they stop animals dead in their tracks.

Silent but deadly, our next century's quiet electric cars pose the greatest risk of all.

With dwindling and damaged habitat, animals are losing ground in humanity's broader war against wildlife. Even if we do nothing, the rate of roadkill will decline. From lack of wildlife, not from lack of cars or roads. Dare backseat drivers

point accusing fingers into rearview mirrors? The very name "roadkill" shifts the blame, as though the road was the lone assailant. We'd not dare call it "carkill," because the cars are ours.

*Mark Mathew Braunstein is a nature photographer, the author of Radical Vegetarianism, and a paraplegic (which provides him with an excuse for driving a car).*



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