

Nate Hegyi: This is Outside/In, I'm Nate Hegyi.

A couple of months ago, producer Felix Poon found himself watching two tortoises... getting a bit active underneath a coffee table.

Alexxia Bell: So that is a red footed tortoise. That's pizza man.... and that is Sprockets. That is a black Burmese mountain tortoise.

Felix Poon: are they doing what I think they're doing?

Alexxia Bell: They are doing that. Yeah. Pizza Man is a very virile male and he enjoys his friends as much as he can.

[MUX IN]

Nate Hegyi: That by the way is Alexxia (uh-LEK-see-uh) Bell.... who runs something called the Turtle Rescue League out of her house in Southbridge, Massachusetts.

Which makes it sound like an amateur operation, but I assure you it is not.

Alexxia Bell: we have a blanding's turtle.

Alexxia Bell: small painted turtles

Alexxia Bell: We have a red eared slider,

Nate Hegyi: They've got personalized polos... a turtle ambulance. Inside, the house looks part aquarium, part animal hospital – and it is packed to the cloaca (cloh-AY-kuh) with turtles.

Alexxia Bell: Most houses wouldn't be able to withstand this kind of weight, they would break

Felix Poon: simply from the weight of the turtles?

Alexxia Bell: the weight of the water. Downstairs there is probably 20,000 pounds of water.

[MUX SWELL THEN UNDER AND OUT]

Nate Hegyi: There are lots of reasons animals need rescuing. Abandoned pets. Retired race horses..

But as with the origin story of the *Turtle* Rescue League, a lot of rescues start with pavement.

Nate Hegyi: Some years back, Alexxia and her partner Natasha were driving on their way to a hiking spot, when they saw a turtle crossing the highway.

Alexxia Bell: And so I pulled over and I stopped and there was a pond right off the exit that we were going on. So I popped it in the pond thinking that was going to be the end of it.

Nate Hegyi: The next day, they saw *another* turtle.... On the same road. And this one did not look good.

[MUX IN]

Alexxia Bell: A lot of its organs were spilled out, so its intestines and everything were spilled out onto the ground. And in the ground was, you know, was hot tar. It was baking in the sun.

So, I just uh... I couldn't stand seeing it suffer. So we did what we did we did a roadside euthanasia, which is not fun.

Alexxia Bell: So we did what we had to do and put it out of its misery.

Felix Poon: I know this might be graphic, but can you describe exactly what you did?

Alexxia Bell: Yeah, sure. So I took the turtle and I basically placed its head under the front of my car tire and ran over it.

[AMBI SLOW FADE OUT]

Nate Hegyi: That was years ago. Today, Alexxia and Natasha take in about 250 turtles a year in their home slash Turtle Rescue League.

And while some of those are accidentally run over by lawnmowers, or found injured in the wild...

The vast majority... are hit by cars.

Alexxia Bell: So it looks like the car hit him from the left side.

[MUX OUT]

So he's got a left crack and a damaged bridge. So now there's a bit of floppiness going on there. And he's also got a mouth injury here on the side of his head. So we're going to give him pain reliever to help him every day.

Ben Goldfarb: you know, I think the irony of roads is that for all of the mobility and freedom they've provided us, humans, they do precisely the opposite to nature.

Nate Hegyi: This is Ben Goldfarb, author of the book Crossings: How Road Ecology Is Shaping the Future of Our Planet.

And while cars might not seem like a big threat compared to climate change and habitat loss... What Ben will tell you, is that around one million vertebrate animals are killed on American roads every single day. One million.

Ben Goldfarb: We treat roads as though they're rivers

[THEME MUX FADE IN]

you know, some geological feature that's been there forever when in reality, you know, our roads are these recent constructions, they're these forces of division and separation and isolation and death.

<<NUTGRAF>>

Nate Hegyi: For many people, roads represent freedom. But for wildlife, it's just the opposite.

So today on Outside/In, Producer Felix Poon talks to Ben Goldfarb... about how two very different animal species are impacted by roads.

He'll explain how our infrastructure turned so deadly... and what people are trying to do about it.

Here's Felix.

<<FIRST HALF>>

Felix Poon: Ben Goldfarb is the kind of guy who's thought long and hard about one of the world's least interesting jokes.

Ben Goldfarb: in the logic of the joke, the road is sort of inevitable. Right. And it's the chicken whose actions are questionable and foolish and and dubious, you know, why did the chicken cross the road? We don't actually examine the more the more important question, which is why did the road cross the land in the first place? Who put the road there?

Who put the road there?

It might seem like an obvious question. But human beings were not actually the first species to start breaking trails. We're just the first ones to pave them over.

Ben Goldfarb: there are lots of accounts from colonists describing how, you know, ten men could walk abreast along a bison trail.

Ben says a lot of the old bison trails that criss-crossed America became footpaths for indigenous people.

And then colonists repurposed those footpaths into rough Vand ready wagon roads...

But then...

[BIKE BELL AND CHAIN SFX IN]

Ben Goldfarb: it was really bicycle riders who first pushed the country to improve its roads and

[MUX IN]

The League of American Wheelmen, this group of bicycle riders called out all of the the crummy roads all over the country and lauded the ones that had been improved.

So it was really, you know, the bicycle riders who... pushing for improved roads literally paved the way for the takeover of cars.

Felix Poon: Now before you go blaming cyclists, you should know that when cars took over the roads, it was actually pretty controversial.

Ben Goldfarb: You know, they're running down pedestrians. You know, they're taking over streets where kids used to play stickball and, you know, and and various, you know, peddlers used to hawk their wares. You know, cars are considered these these death machines.

There were big anti-car protests across the country in the 1920s – cities unveiled monuments inscribed with the names of dead children.

Meanwhile biologists were publishing roadkill counts in journals, hoping to spur public action to slow things down.

Ben Goldfarb: But, you know, it turns out that the car has very good lobbyists. Right. Of course, there are the the

car companies themselves, the oil companies...the federal government.

Not that everybody needed convincing. Roads connected the country in new ways.

But today, we pour hundreds... of billions... of dollars every year, maintaining [more than 4 million miles worth of open road](#).

Ben Goldfarb: the car is this sort of unstoppable force and, and the animals are collateral damage.

[MUX SWELL THEN UNDER]

Collateral damage. Roadkill.

These euphemisms speak to the fact that animals haven't adapted well to a world spiderwebbed with asphalt.

[MUX OUT]

Some species are what ecologists call "road avoiders". Grizzly bears are one example.

Ben Goldfarb: even one car every ten minutes in some cases is enough to prevent grizzly bears from crossing a road. And as a result, they, you know, essentially end up in these little islands of habitat because they refuse to cross highways and they don't find mates and food as a result.

Felix Poon: But most species aren't cautious enough with roads. Some even seem mesmerized by cars.

Ben Goldfarb: the reason that deer freeze in headlights is that they have pupils that fully dilate in low light conditions to absorb as much light as possible.

Felix Poon: A useful adaptation to see a mountain lion coming for you in the dark. But not so useful on the road.

Ben Goldfarb: you know, when you're being hit by the high beams of an F-150, you're just completely blinded.

Felix Poon: And then you've got amphibians and reptiles.

These are animals that sometimes travel across roads en masse.

We actually talked about this in one our very first Outside/in episodes: [10x10 Vernal Pools](#).

Ben Goldfarb: frogs, salamanders, turtles, snakes that biologists have described as non responders, basically animals that they're just going to cross the road no matter what

[MUX IN]

Ben Goldfarb: And that's, of course, really dangerous because you get these kind of catastrophic roadkill events where, you know, cars will flatten hundreds or thousands of amphibians in a night.

[MUX SWELL]

From a sheer numbers perspective, squirrels are the most common type of roadkill:

They're zig-zaggers that often *sprint* into traffic.

***Turtles* – by comparison – seem like they'd be easy to dodge.**

But Ben told us a story that says otherwise.

Ben Goldfarb: So Matthew Aresco, he's a herpetologist, you know, a scientist who studies reptiles. He grew up...fascinated by turtles, love turtles from a young age, moved down to Florida to to do his PhD research on turtles.

[MUX OUT]

So one day, Matt gets a tip about a bunch of turtles trying to cross six lanes of highway just south of Orlando, Florida.

Ben Goldfarb: Matt Aresco goes to check out this situation, you know he basically finds this just catastrophic turtle massacre

[MUX IN]

On one side of Highway 27 is Lake Jackson. From satellite photos, it looks a little bit like a ping-pong paddle.

On the other side of the highway is *Little* Lake Jackson - which looks like the ping-pong ball.

The highway splits them in two.... And BIG Lake Jackson was drying up.

That was driving all of these turtles from one side to the other where there was still water....

...And across Highway 27.

Matt – the turtle scientist – scraped up 90 smashed turtles on that first day.

Their shells cracked like hard-boiled eggs, and underneath, you could see their pink bodies, like magma oozing out of fissures in volcanic rock.

[MUX SWELL]

Matt went back there every day, with big plastic tubs. He picked up as many live turtles as he could, and released them on the other side.

Ben Goldfarb: And he does this for months, going out there every day picking up turtles, and he moves thousands of turtles.

Matt noticed an imbalance between the sexes. Because the highway shoulder was prime habitat for females to lay their eggs, females were dying at much higher rates than males, and Matt knew that a population that loses too many females is doomed.

[MUX SWELL AND OUT]

The irony here, is that we know exactly how to solve this problem.

The trick to helping wildlife cross a road? Is to build another road – albeit, a different one: one that’s built for wildlife.

They’re called wildlife crossings – tunnels or bridges that give animals a safe passage across roads and highways.

The first ones were built in Europe, in the 1970s. Hunters were worried about dwindling populations of wild game, which were getting hit and killed by cars.

Not long after, the US started building crossings to address “deer-vehicle crashes” or DVCs, which [still kill hundreds of people](#) - and probably tens of thousands of deer - every year.

Hitting a turtle on the road though...isn’t much of a danger to humans or their cars. And given the sorry state of roads and bridges built for people – you can imagine it’s a hard sell trying to get funding to build roads for turtles.

But on Highway 27, there happened to be a little something called a culvert.

[MUX IN]

Ben Goldfarb: you know, this big pipe essentially that that that connects the two lakes beneath the highway.

Culverts are normally for letting water pass under a road.

But Matt Aresco thought, maybe this one could be used as a wildlife crossing. If he could just...get the turtles... to use it.

Ben Goldfarb: But he basically asks the state of Florida to to build to build a fence.

basically that's going to guide the turtles to this to this culvert

Weeks go by...and then—

Ben Goldfarb: And, you know, the state just, you know, sends him like a few rolls of mesh and says, okay, you know, go for it. Knock yourself out.

Felix Poon: Matt builds a kind of DIY fence.

And... it doesn't *really* work.

All it does is keep the turtles off the road, which gives him a chance to capture them and move them himself, in the end, he [moves more than 8,000 turtles](#).

[MUX SWELL AND OUT]

Matt was getting fed up. He knew what the turtles needed was a long-term solution - a real wildlife crossing, with concrete walls and multiple culverts.

So he started campaigning.

He founded a nonprofit, rallied supporters to elect a pro-turtle candidate to local office, and got letters of support from around the world.

The state finally agreed to build a crossing using money from Barack Obama's 2009 stimulus package.

But when the plan was announced, there was national backlash.

Tom Coburn. This sort of famously tight fisted senator from Oklahoma catches wind of this and sort of uses this this turtle eco passage as the prime example of federal government waste.

[CLIP]

Tom Coburn: Should we really be spending that kind of money on turtles...there's plenty of turtles in Florida if you haven't been there lately.

[MUX IN]

Matt worried the state would back out under all the scrutiny.

Ben Goldfarb: Fox News talks about it. Even CNN kind of makes fun of it.

Felix Poon: But to Matt's surprise, Florida went ahead with the plan, and completed the crossing in 2010.

He still got updates on the Lake Jackson turtles, even after the crossing was built. To this day, Matt still gets updates about the Lake Jackson turtles.

Ben Goldfarb: people would call him and say, you know, hey, I saw number 217, you know, nesting in the neighborhood.

he even got a call from an alligator trapper who found one of the turtles he tagged in a gator's belly. And and this guy called him and said, hey, I found one of your turtles.

And, you know, and even even that, you know, I think I think Matt Aresco found somewhat satisfying in that it was proof that, you know, turtles were playing every role in the in the food web.

You know, they were out there nesting and being eaten and doing their thing and being turtles as they should be.

[MUX SWELL]

Nate Hegyi: That's one happy ending, in a story that doesn't seem to have a lot of them.

But cars don't just threaten species by squishing whole populations one animal at a time. Our roads also cause societal, and even genetic mayhem.

That's coming up next.

[MUX SWELL AND OUT]

<<2ND HALF>>

Nate Hegyi: Welcome back to Outside/In. I'm Nate Hegyi. And today, we're talking about how animals have adapted, or not adapted, to a world crisscrossed by roads and highways. Here's producer Felix Poon.

Felix Poon: In the early 2000s, the National Park Service started a study of cougars. Not in the remote Rocky Mountains, or along the borders of Texas - but in the Santa Monica mountains, just outside of Los Angeles.

[MUX IN]

At the time, they weren't sure there were any cougars left there.

Ben Goldfarb: You know nobody really knew that this these cats were still there. They had sort of heard scattered reports from hikers, but they weren't quite sure. And then they actually caught this. They caught P1.

That's author Ben Goldfarb. The "P" in P1 stands for Puma concolor (KAHN-kuh-LOOR), the species' scientific name.

They're also called cougars, mountain lions, and panthers.

And the 1 in P-1 means it was the first cougar that researchers caught and outfitted with a GPS collar to study its movements.

But, their excitement, quickly gave way to horror, as they observed P1 go berserk across the Santa Monica mountains.

Ben Goldfarb: You know, he killed his own mate. He killed he he killed some of his own offspring and actually mated with one of his own daughters.

Ben says this kind of violence and incest? It's not unheard of among cougars. But the researchers were like... this is a whole 'nother level.

Ben Goldfarb: there was something a little bit strange about this this population and maybe, you know, the very small size of the island that all these cats were trapped on was part of the problem.

By "island", Ben doesn't mean a literal island. He means that the Santa Monica mountain range, by cougar standards at least, is really small.

It's walled off by the Pacific Ocean to the south. Suburbs block off the west. Then there's these behemoth 10- and 12- lane highways to the north and east: US 101 and Interstate 405.

And the thing about cougars is that they're a very male-dominated, territorial society. There can only be one male in any territory. That's why when young male cougars are born—

Ben Goldfarb: they have to sort of disperse out to new territories. You know, they have to get away from their their own fathers, essentially

But here in the Santa Monicas—

Ben Goldfarb: these young males, they'll get killed by their own their own fathers because they can't leave they're just hemmed in by freeways on all sides.

[MUX SWELL AND OUT]

There's a term for what these highways have done to the Santa Monicas – landscape dissection. It's a fitting term for how roads slice through the landscape with the surgical precision of a scalpel.

it used to be scientists like Darwin had to go all the way to the Galapagos to see the ecological effects of islands. But with widespread landscape dissection? There are little islands everywhere.

In the Northern Rockies, scientists can tell which side of the highway a grizzly was born on just by looking at their DNA. In Europe, there's a distinct population of beetles that only lives in one highway exit loop.

If the animals disappeared from these islands, it would be an extirpation, a local extinction. Thing is... [Humans have built 40 million miles of roads on this planet.](#) Extirpations can, and will add up.

Felix Poon: The scientists studying the Santa Monica cougars knew all this. Which is why they were excited when - against all odds - a cougar named P-12 crossed the 101, and survived.

He killed P-1, the unhinged cougar that slaughtered his own family.

Or not - scientists aren't quite sure how he died.

Either way, P-12 became the new dominant male, infusing some much-needed fresh DNA into the population.

But as the years passed, P-12 fell into the same trap P-1 did.

Ben Goldfarb: You know, no new cats were able to follow him, so he ended up mating with his own daughter and then his own granddaughter and then eventually his own great granddaughter. And, you know, the population became even more inbred over time.

So, you know really what that showed is that maybe once in a while every, you know, number of years, a cougar is capable of crossing one of these busy freeways and entering or leaving this population. But it's not going to be reliable. Right. And that, you know, even if P 12 made it, there's no way of counting on new cats entering this population unless we help them.

[MUX IN]

Like the turtles in Florida, conservationists wanted a wildlife crossing here for the cougars.

But this would require something of a whole different magnitude.

the 101 spans a whopping 10 lanes...12 if you count the breakdown lanes.

So, a tunnel wouldn't work because it'd be too long and dark, wildlife would never use it. Plus they didn't just want it to work for cougars. They wanted all animals to use it,

like deer, lizards, frogs – all of them with their own needs: like, barriers to block the noise and headlights from cars.

Basically...a long, wide, nature highway... complete with trees, and grasses, and flowers.

The price tag for all this?

Estimates ballooned to over a [hundred million dollars](#).

But conservationists like Beth Pratt weren't deterred.

[MUX SWELL THEN UNDER AND OUT]

Ben Goldfarb: Beth's an amazing person. She's. She's devoted, you know, sort of like. Like Matt Aresco, the turtle guy. You know, she's devoted a huge proportion of her of her life to promoting the cause to build this wildlife crossing that, you know, P22 symbolized.

It might be hard keeping track of all these cougars... but P-22 was a son of P-1, and, after crossing two of LAs superhighways, he became famous as the lone member of his species in Griffith Park...the hills where the Hollywood sign is.

It's the smallest known territory for a cougar.

And P-22 endeared himself to Los Angelenos as a sort of spokes-cat for Beth's campaign.

- https://www.instagram.com/reel/Cj_RfKYPOME/?hl=en
We are celebrating the most famous mountain lion in the world, P-22!

- <https://www.instagram.com/reel/CkBpuMFDNbR/?hl=en>
P-22! P-22! P-22!
- <https://www.youtube.com/watch?v=SaCN7aBFLRY>
Beth Pratt: I'm so dedicated I even have a P-22 tattoo.

[MUX IN]

Reporter: Beth Pratt there, instrumental to all of this, that was her first tattoo at age 40.

Because of Beth's work, and P-22's fame, Donations rolled in.

And then finally, this year, 2023.

<https://www.youtube.com/watch?v=SaCN7aBFLRY>
Anchorman: Well on this Earth Day, a long awaited project to build a wildlife crossing over the 101 freeway is getting started.

When it's complete at the end of 2025, the Wallis Annenberg Wildlife Crossing will be [the first bridge in the California highway system designed specifically for wildlife](#). And it'll be [the largest wildlife crossing in the world](#).

Unfortunately, P-22 - the spokescat that helped inspire donations - won't be around for the ribbon-cutting. He was hit by a car, and had to be euthanized.

[MUX SWELL AND OUT]

Let's just pause a second. It took a celebrity cat, and this huge campaign, to get this impossibly complex crossing

built, and even he can't be saved. So...just how hopeful are we supposed to feel about wildlife crossings?

Ben Goldfarb: You know the 2021 Infrastructure Act, you know, had this \$350 million pot of funding for wildlife crossings, you know, the largest pool of money ever allotted to animal friendly infrastructure, And yet, you know, that's basically enough to treat every single roadkill hotspot in California with no money left over for all of the other states.

Felix Poon: Yeah, so, so what what can be done? Like, okay, if someone's listening to this, they're like, man, I want to get involved in this. Where should they begin?

Ben Goldfarb: One of the great things about ecology, I think, is that we are all part of the problem,

But, you know, we're all we're all potentially part of the solution as well.

And, you know, there are lots of great citizen science apps out there that allow you to record your roadkill sightings. And in some cases, you know, those sightings have actually informed the construction of wildlife crossings.

One of the really fun things that I did while writing this book was was take part in a frog shuttle. You know, moving frogs and salamanders from point A to point B safely without getting crushed.

You know there's also...practically every state in the country at this point. You know either has recently passed a bill or is in the or is in the process of of passing a bill

that's going to allocate new money for wildlife crossings and fences. And, you know, certainly there are opportunities to participate in that process by, you know, writing letters to to politicians and so on.

[FADE IN AMBI OF MICHAELA DRIVING]

Michaela Conder: alrighty...we're gonna pull over here and get a look at the water on this side.

Felix Poon: Last month, I tagged along with two staff from the turtle rescue league to release turtles back into the wild. They scouted a few spots along the edge of a reservoir until they found a good spot for the adult turtle they had.

Michaela Conder: I think this is a really nice place for him.

Natasha Nowick: This is beautiful, welcome home guy.

Michaela Conder: So shall I go grab him from the car and bring him on over. Alrighty!

Michaela Conder and Natasha Nowick carried a big plastic container from the car down to the edge of the reservoir, and opened the top, revealing a huge snapping turtle, almost the size of a spare car tire.

Michaela Conder: So here's our old guy you can actually see. He's got all kinds of worn areas on his shell. you can really tell that that he's a bit aged.

Natasha Nowick: Shall we lift him?

Michaela Conder: I think we shall.

Natasha Nowick: Okay. I'll just move the box. Okay, buddy.

Michaela Conder: Alrighty. Yeah. Okay. So. Here we go buddy.

Natasha Nowick: Here we go.

Michaela Conder: Oh, What do you think? Are you ready to go home? Oh, he likes it.

[CONTINUE OUTDOOR AMBI UNDER]

This turtle wasn't hit by a car. But afterwards, we went to a shallower part of the reservoir to release 50 snapping turtle hatchlings. Each one of them no bigger than a half dollar coin, Babies from a few mom turtles that were hit by cars but didn't survive.

Michaela Conder: Okay. Three, four, and five. All righty. Five little babies.

For every wildlife crossing in the United States... there are four *thousand* miles of road. That's the distance between Jacksonville, Florida... and Juneau, *Alaska*.

For people trying to rescue animals from being roadkill, it seems like a Sisyphean task.

But Michaela and Natasha tell me that snapping turtles can live up to 175 years. The car wasn't even invented 175 years ago. Just imagine a hundred 75 years from now... the year 21...98 – these turtles could live to see the year 21 98!

[MUX IN]

What will our roads look like then? What will our world look like?

[Natasha release tape]

Natasha Nowick: Mine are scrambling in different directions. Hey, that's your buddy you're putting your foot on.

Here we go kid.

.... Oop, you're not staying.

Okay kids. Are you ready kid, you see what's out there?

Here we go, here we go, here we go. Let me take you down to the water. There we go.

Okay, last one, good luck number 51.

Okay, be good.

[AMBI FADE OUT / MUX SWELL]

Nate Hegyi: If you wanna learn more about the Turtle Rescue League, be sure to check out the new book, *Of Time and Turtles: Mending the World Shell by Shattered Shell*, by Sy [like the word "sigh"] Montgomery. Alexxia, Natasha, and Michaela are all in it, plus Pizza Man and Sprockets, the turtle lovers you heard at the top of the episode.

And be sure to sign up for our newsletter so you get a behind-the-scenes look at the reporting for this episode. You can do that on our website, outsideinradio.org, where you can also find our newsletter archives in case you miss it in your inbox.

<<CREDITS>>

Nate Hegyi: This episode was reported and produced by Felix Poon.

It was edited by Taylor Quimby. I'm your host, Nate Hegyi. Our team also includes Justine Paradis. Rebecca Lavoie is our executive producer.

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