



By Christopher E. Smith

Critter Crossings

These new projects help Minnesota animals
cross roads more safely.

HAVE YOU ever seen a dead animal on or next to a road? The animal was probably struck and killed by a vehicle. Unfortunately, this happens often all around Minnesota. Deer, raccoons, squirrels, and turtles are among the many types of animals that sometimes end up as *roadkill*.

Roads can also be a threat to wild animals in other, less obvious, ways. Some animals may avoid crossing roads altogether, and while this may keep them from becoming roadkill, it also means they are unable to get where they need to go. The road becomes a barrier and cuts them off from *habitat*—the places where they live and feed and roam.

Fortunately, there are people working on solutions to help wildlife get across roadways safely. The Minnesota Department of Transportation, which is in charge of many roads and highways in the state, is working to better understand how animals are affected by roads and to develop creative solutions to reduce their risk. As a wildlife ecologist who works for the department, I help find ways to keep animals safe with new types of animal crossings and other road features.

Let's look at some of the projects that have been done in Minnesota to create more animal-friendly roadways.



Culverts for Creatures

Culverts are those big drains that you sometimes see under a road. Some are small like a pipe, while others are big like a tunnel. Although the original purpose of most culverts was to let water pass under the roadway, guess what—many animals have discovered that when a culvert's not too wet, they can use it as an underground passageway while cars zoom overhead. When given a chance, nature often finds a way.

We often learn which animals use culverts by the tracks they leave behind.

Hoofprints show that deer travel through large box culverts beneath busy roadways. Prints left by raccoons, coyotes, rabbits, and other small mammals show they readily use small culverts to safely cross roads. We also sometimes put a motion-activated *trail camera* at a culvert opening to capture surprise photographs of animals to learn which ones are using culverts, and when.

Some culverts are better than others. *Road ecologists* are scientists who study



the interaction of wildlife and roads. They have learned that modifying culverts can make them even better for animals trying to move to and through their habitat. Making a culvert larger, for instance, can allow it to carry water while at the same time providing safe under-the-road passage for wildlife.

Using multiple culverts can help animals, too, road ecologists have learned. A lower culvert may be placed to carry water most of the time, while another one

is usually high and dry—better for wildlife. Only during heavy rains and flooding does the higher culvert carry water.

Road ecologists have also learned that the best culverts for animals are ones that are easy to get to. Culvert ends in the past were often protected with *riprap*, big chunky rocks with sharp edges. Now we know that using a smoother gravel or *aggregate* surface helps smaller animals like turtles get to and through culverts.



The Passage Bench

The next time you cross over a bridge, consider what's passing underneath. In Minnesota it's often a stream or river—and there may be animals traveling along that waterway, too, avoiding a more dangerous road crossing above. A pathway called a *passage bench* makes it easier for wildlife to move under the bridge.

Boulder-sized riprap has often been piled under bridges to stabilize streambanks and prevent erosion—but just like the riprap at culvert ends, the riprap un-

der bridges gets in the way of animals. The passage bench is a narrow passage-way through the jagged rocks, again using aggregate. When these smoother paths are installed under bridges along streams and rivers, which animals naturally use to move to and from important habitats, they can restore important habitat connections.

Animal-friendly add-ons. The Minnesota Department of Transportation installed its first passage bench around 2005 after work-



ing with the Minnesota Department of Natural Resources and the U.S. Fish and Wildlife Service to come up with the idea. It's a relatively simple but effective solution to a challenge that most people were not even aware of, but that affects animals every day.

Since 2005, more than 150 passage benches have been installed in Minnesota during bridge replacement projects. And we've been pleasantly surprised to learn just how many kinds of animals, both large and small, have been using these passage-

ways, including deer, bears, coyotes, and even water birds like great blue herons.

A new idea builds on the success of the passage bench to make areas of rip-rap safer for small wildlife such as turtles, frogs, and ducklings, which can fall into the openings, or *voids*, between the big rocks. Workers pour smaller rocks over an entire field of riprap to fill these voids and make the whole area less dangerous for small animals and more walkable for wildlife large and small.



Fences for Safety

A fence around a backyard can keep a pet dog contained. Fencing at the neighborhood park can keep kids from straying onto busy streets. A similar idea is sometimes used by biologists to keep wildlife off roadways. Fencing can direct or funnel wildlife to a safe crossing location.

A wildlife fence can be tailored for the job. For example, a fence designed to direct turtles to a culvert may be only a couple of feet tall and made of a clothlike material. A fence designed to direct deer to a safe crossing under a bridge must be sturdy and 8 or more feet tall—deer can jump really, really high.



Restored Habitat Connections

A few years ago, the Minnesota Department of Transportation installed special turtle fencing at several locations in the Twin Cities area. In one place near the town of Waconia, fencing was installed where roads cross wetlands and other water bodies that are habitats for turtles and other small animals.

Researchers from the Minnesota Zoo visited the area many times during the spring, summer, and fall to count the num-

ber of small animals they found alive in their habitat or dead on the roadway. They found the special turtle fencing worked great, reducing the number of roadkill turtles by 63 to 87 percent.

A fence that doesn't lead animals to a safe crossing can be worse than no fencing at all, blocking wildlife movement and increasing *habitat fragmentation*—the breaking up of habitat.



Bear Bridges and Other Cool Crossings

Picture a bridge over a road that is not paved on top but instead has a strip of forest where bears and other wildlife can safely cross. Or a tall, wide, concrete culvert under a road that provides a pathway specially made for migrating mule deer, cousins of the white-tailed deer we have in Minnesota. These are just a couple of examples of overpasses and underpasses that were specifically designed and built for wildlife elsewhere in the United States and Canada.

Turtle tunnel, deer culvert. Minnesota has a few crossings made just for animals. In 2014, Washington County installed the state's first dedicated turtle underpass, often called a "turtle tunnel," under a busy county highway where there were high levels of turtle roadkill. Most recently, the state Department of Transportation installed a large culvert especially for deer and other wildlife along a newly constructed portion of

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U.S. Highway 14 near Claremont.

Special wildlife crossings are being used in more places as research shows they can reduce wildlife-vehicle collisions by as much as 80 percent. Animals are safer, and so are the people traveling in vehicles. At the same time, these crossings are good for conservation, helping connect animals to habitat.

Rethinking roads. Some ecologists think that asking how to get wildlife safely across roadways is the wrong question, and that we should instead ask how to get our

roadways safely across our environment.

We need roads. They help carry people and things where they need to go, and they are not going away anytime soon. But we are learning that we can make roads safer for the many animals that live around us in Minnesota.

There is a growing awareness of the importance of wildlife crossings in roadway projects, and increased support for these crossings to improve motorist and wildlife safety alike. The next you cross a bridge, look down and perhaps you will get a glimpse of something crossing beneath you. ♻️