

WHERE ROADS AND HABITAT MEET:

Benefitting People and Wildlife

Connected Communities and Connected Habitats

While transportation infrastructure is essential to mobility and commerce, roads and culverts sometimes have unintended consequences for wildlife and fish. The same road that allows a person to drive from one place to the next may have the opposite impact on a bobcat, for instance, by blocking the animal's movement from one patch of forest to another. Similarly, a road with a culvert underneath can allow drivers to cross over a stream, but the culvert may end up blocking brook trout from swimming upstream. Connected forest and stream habitats provide natural pathways for wildlife and fish to move in search of food and mates and to maintain stable populations in response to a changing climate. Where roads or culverts intersect with important natural pathways, transportation agencies are increasingly finding effective and relatively low-cost options that provide co-benefits for fish, wildlife and people.

Reasons to Invest in Connected Habitats

Improving safety: Each year, Canada sees an estimated 45,000 collisions between large mammals and vehicles; the US sees between 1 and 2 million. Wildlife-vehicle collisions result in about 200 deaths and 26,000 injuries per year in the US. Canada experienced 106 fatal wildlife-vehicle collisions between 1999-2003, along with 9,600 non-fatal injury collisions.

Preparing for climate change: Designing bridges and culverts to ensure the unimpeded movement of fish and wildlife also ensures that higher flows can pass through these structures during extreme precipitation events. A recent study from Vermont found that culverts designed for the movement of fish were among those that avoided major damage during Tropical Storm Irene, while many smaller culverts failed, resulting in millions of dollars of repair costs.

Saving money: Transportation infrastructure designed to facilitate safe movement for wildlife and fish can help reduce costs associated with collisions, as well as save money in maintenance costs. The total cost of wildlife-vehicle collisions in the US is estimated at \$8 billion/year. Property damage costs from wildlife-vehicle collisions in Canada are about \$200 million/year. A recent study estimated that the average cost of wildlife-vehicle collisions in the US and Canada – including fatalities, injuries, towing, vehicle repair, and carcass removal – is \$6,600 per deer collision and \$30,000 per moose collision. Studies from the Northeast and the Great Lakes have found that upgraded culverts designed to allow for fish passage not only reduce flood damage but also cost less to maintain.

Taking care of the environment: Designing our roads for crucial movements of wildlife and fish helps ensure access to the habitats they need to thrive, reproduce, and maintain genetic diversity. These investments benefit native species, biodiversity conservation, ecosystem integrity, ecological and evolutionary processes, and human communities. Designs that improve fish passage also often improve water quality.

Right-sizing a culvert yields multiple benefits

The original culvert on Bronson Brook in Massachusetts, shown in the top photo, was a barrier to the movement of fish and it provided no dry passage for wildlife. The culvert had a history of clogging with debris and in 2003 it failed entirely, leading to closure of the road. The replacement structure, a bottomless aluminum arch shown in the bottom photo, restores the movement of fish and provides a dry surface for wildlife to move under the road. This structure passed the extreme flows of Tropical Storm Irene, allowing the road to remain open and safe, and requiring no maintenance from the highway department.

PHOTOS: © Amy Singler; The Nature Conservancy/American Rivers



Four Ways to Take Action

Collaborate: By working with environmental and natural resource agencies, as well as with researchers from university and conservation organizations, transportation departments can leverage their resources. Collaboration can bring new scientific expertise, applied experience in implementation, and opportunities to secure and leverage funding.

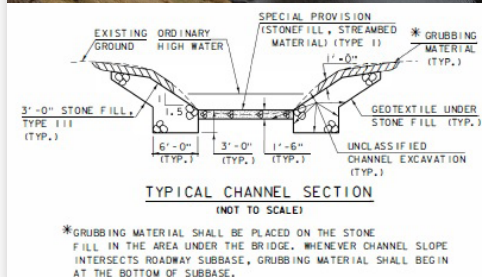
Identify key locations: Since not all road segments and stream crossings are equally significant for wildlife and fish connectivity, it is important to identify priority sites for action along road networks. A range of remote rapid assessment tools can help agencies identify priority road segments, while camera monitoring (photo at right) and roadside tracking can complement this information.

Plan, design, and operate: Data on priority road segments and road crossings can be integrated into transportation asset management planning so that future investments at these sites are designed to maintain or enhance habitat connectivity while also keeping roadways functioning. Guidance documents can help agencies get the most out of every transportation dollar being spent.

Monitor: Monitoring investments in new designs to determine their effectiveness is critical to inform future investments and help to build public support for this work. Monitoring enables agencies to learn from their experiences and share this knowledge with other agencies.

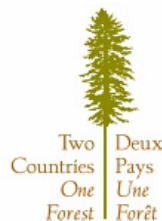


PHOTO: © The Nature Conservancy in Vermont



Grubbing material under bridges has low costs and high returns

To provide a passage surface for wildlife, Vermont's Agency of Transportation specifies placing grubbing material on top of riprap under all bridges with at least six feet of room between ordinary high water and the bridge bottom. The additional cost of this work is estimated to be between \$3,000 and \$10,000 for machine and operator time. The specification is shown here, along with a photo of a wildlife shelf that was built under an existing bridge on Interstate 89 to allow animal movement.



Partners of Two Countries, One Forest's Staying Connected Initiative, including public agencies and non-profit organizations, are working in five states and three provinces to sustain a connected forested landscape for the benefit of nature and people. Contact us at jlevine@tnc.org to learn more about our work to make roads safer for wildlife, fish, and people.