214 P ☒ NP ☐ DM58.1

Projets d'amélioration de la route 175
des kilomètres 60 à 84 et 84 à 227

RFL et SAG / STO-TEWK 6211-06-042

Gélinas, Monique (BAPE)

De: Charles-A. Drolet [droletca@videotron.ca]
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À: route175@bape.gouv.qc.ca
Objet: TR : Passages aériens pour la faune et l'orignal

Suite à une question d'un commissaire (M Deriger ou M. Marquis) lors de la présentation de l'UQCN, séance du 25 mai en après-midi, voici de l'information sur les passages aériens et l'orignal. Voir le tableau page 3 du document du parc national de Banff, qui indique que les orignaux (du moins les quelques observations rapportées) préfèrent les passages aériens aux passages souterrains. L'utilisation des passages aériens par l'orignal est aussi investiguée par Mattias Olsson de l'Université de Karslstad, Suède. (mattias.olsson@kau.se). Noter que les passages aériens en existence sont des structures d'au moins 50m de large, couvertes de végétation et bordée par des monticules pour masquer la route.

C.A. Drolet
Commission biodiversité
UQCN

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Wildlife Overpass - click to see a larger view

Site Directory

Banff National Park's Crossing Structures

Banff National Park has taken the lead in trying to reduce the number of animals and people being injured and killed along the Trans Canada Highway. It has been a long process, and researchers are still learning more about the effectiveness every day.

Historic Timeline

The construction of wildlife overpasses along the Trans Canada Highway began in the mid 1980s with the twinning of the highway from the east park entrance to the junction with the Bow Valley Parkway. During the construction, a series of 11 underpasses were built and a 2.4 m fence was also built along each side of the highway. The overpasses vary in design,

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with some being more elaborate than others. The majority are open span cement bridges installed at a cost of $300,000. One of the underpasses is a 4 metre metal culvert (approximately $50,000).

A second stretch of highway was twinned in 1997. This section begins where the original stretch ended and extended the twinned section all the way to Castle Junction. Along this stretch two wildlife overpasses and 11 additional underpasses were built. The overpasses each cost of 1.851 million dollars. The underpasses are composed of 9 culverts of various sizes and two creek bridges. The fencing was also upgraded along this section of highway to include a buried apron to prevent animals from tunneling under the fencing.

Studying the Structures

In 1996, research began to determine the effectiveness. Early results showed that the underpasses were very effective for elk, deer and coyotes, but that large carnivores like wolves, cougars, black and grizzly bears were reluctant to use them. It was this research that led to the building of two overpasses during the second phase of highway twinning. The research uses a combination of track paths and video surveillance to get details on just what animals are using the structures and how often. Where track paths are utilized, biologists place a smooth sand pathway within the underpass and study the tracks in the soft dirt every few days. This gives a good indication of what animals are using the structure and how often.

Before we judge the effectiveness, researchers needed to clarify expectations. In many areas, crossing structures were considered effective "If the target species use them at least occasionally and are used by a large part of the local fauna". Tony Clevinger, the principal researcher looking into the structures, felt that we also needed to take into effect the local distribution of wildlife species. As an example, 300 elk crossings may not be more significant than 2 grizzly crossings. It is very difficult to state that a certain number of crossings equals effectiveness.

There are numerous factors that combine to determine the attractiveness of a crossing structure to a particular species. As an example, for grizzly bears, the distance from Banff Townsite appears to be an important consideration, while elk were influenced more by the length of the underpass. Carnivores like wolves and cougars preferred underpasses that were near drainages. For all species, the number of humans using the underpasses plays an important role in reducing the effectiveness of the structures.

Do They Work?

The simple answer is YES, and in some cases better than expected. Between 1996 and March of 2001 researchers documented 32,518 crossings at the various structures. This number does not represent individual animals, but rather crossings. A single animals may make numerous crossings.

Animal	Under pass	Over pass	Total
Grizzly Bear	23	10	33
Black Bear	513	11	524
Wolf	1,286	28	1,314
Cougar	668	16	684
Coyote	2,211	103	2,314
Elk	18,077	751	18,828
Deer	7,182	140	7,322
Moose	1	10	11
Bighorn Sheep	1,488	0	1,488

As you can see from the above table, all of our large animals with the exception of bighorn sheep have utilized the overpasses. However currently sheep have not used any of the crossing structures along the more recently twinned section of Trans Canada. The structures have been very effective, and in particular moose seem to prefer the overpasses. There are a few problems with their design though. Because they are an arched structure, an animal must climb up into the unknown to cross on the overpass. This means they cannot see to the other side of the road before climbing to the summit. Future designs may use the landscape more efficiently to place the underpasses at the bottom of gulleys to give the animals better visibility.

The overpasses were built because early research indicated that underpasses were not effective for large carnivores. We must realize that it takes a long time to develop accurate wildlife research and when the second section of highway was twinned, this lack of effectiveness led to the building of the two overpasses. Today, we are finding that many of the animals are beginning to adapt to the underpasses. In the future, it may be more economical to build more of the inexpensive underpasses than a few very expensive overpasses.

Small Animals

While most of the focus has been on large animals, we must remember that there are many smaller animals that also need to cross the highway. Researchers use the term highway permeability to describe the ease with which animals are able to freely cross the highway. For small animals, these wide stretches of pavement represent a very serious barrier to movement. In some areas, concrete centre dividers have been placed. These were found to represent a very serious barrier. Animals would cross one lane of traffic only to meet a concrete wall. To reduce this challenge, holes have been placed near the base of the concrete barriers to allow animals to cross.

For many animals, especially martens, drainage culverts offer a very effective means of crossing. Martens will excavate several metres of snow to clear a blocked culvert to enable them to cross. These small culverts also reduce the risk of predation by limiting the size of animals able to fit through these smaller openings.

Related Links

Ecological effects of roads in the Bow River Valley, Alberta, by Tony Clevinger. He is the principal researcher and this article is required reading.

Highway Research Centre

This is the official site for reading more about what is being done along the Trans Canada Highway.

Wildlife Mitigation Measures: Information on the structures, their design and installation.

Maps of Structure Locations: See where the structures have been placed.

Monitoring and Research: Information on research and monitoring including photographs of animals using the various structures.

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