Implications of Transportation on Wildlife Well-Being

September 2016

The National Center for Sustainable Transportation Undergraduate Fellowship Report

Juliet Martin, University of California, Davis
About the National Center for Sustainable Transportation
The National Center for Sustainable Transportation is a consortium of leading universities committed to advancing an environmentally sustainable transportation system through cutting-edge research, direct policy engagement, and education of our future leaders. Consortium members include: University of California, Davis; University of California, Riverside; University of Southern California; California State University, Long Beach; Georgia Institute of Technology; and University of Vermont. More information can be found at: ncst.ucdavis.edu.

U.S. Department of Transportation (USDOT) Disclaimer
The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the information presented herein. This document is disseminated under the sponsorship of the United States Department of Transportation’s University Transportation Centers program, in the interest of information exchange. The U.S. Government assumes no liability for the contents or use thereof.

Acknowledgments
This study was funded by a grant from the National Center for Sustainable Transportation (NCST), supported by USDOT through the University Transportation Centers program. The authors would like to thank the NCST and USDOT for their support of university-based research in transportation, and especially for the funding provided in support of this project.
Table of Contents

Introduction ......................................................................................................................... 1
Background ........................................................................................................................... 1
Methods and Results .......................................................................................................... 2
Conclusion .......................................................................................................................... 3
References .......................................................................................................................... 4
Introduction

As the number one mode of transportation in the U.S., driving cars has made a number of impacts not only on the urban environment, but also on the natural one. Highways and other such transportation infrastructure reach across our nation, running through many national parks and wildlife areas. These roads may have adverse effects on the habits of wildlife native to the area. The goal of this research is to observe wildlife habits in relation to nearby transportation infrastructure. This study, conducted by the Road Ecology Center, is ongoing and continues to collect data through on-site wildlife cameras. The data collected is then analyzed on the Wildlife Observation Network (WON). The researchers are able to determine species movement across wildlife crossing culverts, overpasses, underpasses, and wildlife trails. Then the research team may determine whether these types of infrastructure provide safe pathways for wildlife. Once the results of the data are analyzed, we may be able to effectuate low-impact, sustainable transportation policies beneficial to wildlife wellbeing.

Background

In addition to the Wildlife Observation Network, the Road Ecology Center runs a supplementary website, the California Roadkill Observation System (CROS). This study provides a basis for studying the impact of transportation by recording vehicle caused fatality of wildlife. The website permits contributors the enter roadkill observations they may encounter on the road. Species recorded include Amphibians, birds, large and small mammals, and reptiles. The site has accumulated thousands of observations, which allow researchers to gain insight into the depth and severity of the issue. As seen in Figure 1, there are a vast number of wildlife casualties attributable to vehicle collisions. The sheer number of roadkill occurrences in the past 90 days of the study indicates that policy must be enacted to mitigate the ramifications of transportation infrastructure.
Figure 1. Roadkill Observations in California from the past 90 days. (CROS)

Methods and Results

In order to observe wildlife habits in relation to transportation infrastructure, roughly 162 monitoring locations have been initiated with 242 camera positions. The cameras utilized for data collection are primarily the BuckEye Cam, Bushnell, HCO, and Reconyx. These cameras are made to detect movement and capture photos in response. A team of researchers analyze the camera’s data, downloading only those featuring wildlife (specifically fauna). Often the cameras capture photos of moving trees, which need to be discarded. The desired photos are uploaded to WON where they can be tagged. Tagging consists of identifying the species, quantity, gender, age class, travel direction, animal activity, and identification confidence. WON assists the researchers in conducting statistical analysis of the wildlife. The most commonly observed animals are shown in Figure 2.
Figure 2. Most Commonly Observed Animals via WON

The type of monitoring station is recorded for each camera. This factor plays an important role in identifying which monitoring station has the greatest impact on wildlife habits. These potentially negative and/or positive impacts may lead to policy designed to renovate specific types of infrastructure.

Figure 3. Number of Types of Monitoring Station

<table>
<thead>
<tr>
<th>Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culvert</td>
<td>20</td>
</tr>
<tr>
<td>Opportunistic</td>
<td>49</td>
</tr>
<tr>
<td>Overpass</td>
<td>9</td>
</tr>
<tr>
<td>Underpass</td>
<td>55</td>
</tr>
<tr>
<td>Wildlife Trails</td>
<td>29</td>
</tr>
</tbody>
</table>

Conclusion

This project continues to generate data reflecting the impact of transportation infrastructure on wildlife habits. The goal is to analyze what types of species are affected and how. This infrastructure undeniably holds negative implications for the well being of wildlife as the California Roadkill Observation System has demonstrated. By studying the types of infrastructure, the research team may be able to discern which types are safe and disposable to animals.
References
