Issues in Wildlife Connectivity and Collisions

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Photo Credit: P. Cramer Site of Future Crossing in UT
Overview

I. What is the History?
II. What is Being Done?
III. What Is in Store for the Future?

Photo credit: P. Cramer
Cramer Research Projects

*National Academies - NCHRP 25-27
‘Evaluation of the Use and Effectiveness of Wildlife Crossings’
  Interviewed 400+ on mitigation methods across North America
  Surveyed 444 for priorities in research & practice

*NCHRP 39-12 Identifying Promising Technologies for Environmental Surveys

*Field Research on Wildlife & Roads in Utah

I. History
I. History

Why Do We Need Connectivity & Crossings?

Roads & Wildlife in the United States

4 million miles
Forman et al. 2003

Up to 20% of land is impacted directly & indirectly
Forman 2000

1 million+ vertebrates killed daily on roads
Urban Wildlife Research Center & Humane Society

1.5 million Wildlife-Vehicle Collisions annually
Insurance Institute for Highway Safety
I. History

Why Crossings?

Ecological reasons

Endangered San Joaquin Kit Fox trapped by traffic in California

Photo credit: B. Cypher

Safety reasons

Moose on highway, Alaska

Photographer unknown
Ecological Reasons for Wildlife Connectivity & Crossings

1. Wildlife need to move
2. Roads can be impenetrable barriers

Puma using wildlife crossing under US 93 in Montana
Photo credit: W. Camel
Female Puma F31 Dispersal: SLC, UT to Meeker, CO
February 9, 2005 to February 8, 2006

Capture: 2/9/05
5/6/05 left Oquirrhs
7/5/05 turned north
9/4/05 crossed Uintas
10/2/05
11/28/05
Death: 2/8/06

Slide courtesy of: M. Wolfe, D. Stoner, and W. Rieth, WILD Dept Utah State University
3. Populations can be affected
   - Lower population numbers
   - Loss of genetic diversity
   - Populations can go extinct

4. Loss of Ecological processes such as water flow, pollination
Transportation Must Address Permeability

Permeability is the ability of many species to move across terrestrial and aquatic landscapes.
I. History

Safety Reasons for Wildlife Linkages & Crossings

1.5 million collisions / yr

200 human deaths

Billions of dollars

Litigation against DOT

Photo credit: J. Fehr
II. What Is Being Done?
II. Current

Three Approaches to Transportation and Wildlife Movement Mitigation

Planning

Human Side

Wildlife Side

Photographer Unknown

Photo credit: J. Barichvich & L. Smith
Planning Approach

The Number One North American Priority for Transportation and Wildlife

Incorporate wildlife mitigation needs early in the DOT/MoT programming, planning, and design process
Transportation Planning Approach: Telephone Survey Results

At what stage of planning does your state consider ecosystem conservation?

Long Range Plans (20-30 yrs)

State Transportation Improvement Plans (5 yrs)

Project Development (Near Future)

~38 out of 50 states began at the Project level (as of 2006)

New emphasis is on long term planning
II. Current

Linkage Assessments Assist with Planning
II. Current

Human Side Approach

- Signs
- Detection systems
- Driver education programs
- Models to identify & predict hotspots

Photo credit: M. Cunningham, Florida FWC
II. Current

**Wildlife Passages – Overpasses & Underpasses Approach**

*Utah’s I-15 Overpass Near Beaver, Idaho*
*Photo credit: S. Rosa*

*Fish Weir, Idaho*
*Photo credit: Z. Funkhouser, ITD*
II. Current

NCHRP Research on Wildlife Passages in North America

Over 550 terrestrial crossings in U.S.

Over 150 terrestrial in Canada

Thousands of aquatic in each country

Photo credit: K. Morgan
Wildlife Crossings In North America

T = Terrestrial crossings
A = Aquatic crossings

November 2007
NCHRP 25-27
P. Cramer
II. Current

Passage Types

Overpass

Photo credit: K. Gunnson
II. Current

Types of Underpasses

Culverts

Photo credit: S. Rosa

Photo credit: P. Cramer

Photo credit: K. Forsman

Photo credit: R. Kalfki
II. Current

Types of Underpasses

Montana US 93 Underpass with Shelves-Paths

California SR 56 Gonzalez Canyon, San Diego

Bridges

Photo Credit: H. Sawyer
Photo Credit: B. April
Photo Credit: P. Cramer
Retrofit Bridges

New Mexico
Tijeras Canyon
Retrofit of existing bridge to provide soil path & slope

Photo credit: M. Watson
II. Current

Underpasses Do They Work?
A review of 27 studies, monitoring 76 passages:

All passed wildlife

74 passed target species
III. What Is In Store for the Future?
Planning Approach: Where Are We Headed?

Early Natural Resource Professional involvement in long range planning, 20-30 years down the line

Greater emphasis on options that are less environmentally destructive

  minimize, avoid, mitigate for all, mass transit

More states completing Wildlife Connectivity Assessments – Linkages – Green Infrastructure
Planning and Policy

SAFETEA-LU Section 6001 Provisions
Early planning with natural resource agency consultation

Western Governors' Association Policy Recommendations
Science

Monitoring of Wildlife Crossings

Linkage Analyses for Entire States
+more

Guidelines for Mitigation
Practice

Wildlife & ecological considerations will become more standard in early planning

Maintenance will be at planning table & will be key to success of crossings

Natural Resource agencies will be greater part of transportation planning, construction teams
Research Priorities

- Understand better the dynamics of animal use of mitigation structures (such as what works and what doesn’t) and disseminate this information **both NCHRP projects**

- Develop and summarize alternative, cost effective wildlife crossings designs and the principles they are based on

- Develop wildlife crossing structure designs and guidelines for the full suite of animals in an area to help facilitate permeability for many species

- Identify and map terrestrial and aquatic linkages

(NCHRP 39-12)
Website with Guidelines for Wildlife Passages

www.wildlifeandroads.org

Photo credit: D. Spencer